Request IR-01:

On p. 2 of 4 in the transmittal letter of March 11, 2022, E1 states that "The proposed energy and demand targets identified in the Plan will direct energy savings closer to optimal IRP levels".

(a) This statement begins by referencing both energy and demand, but ends by only comparing energy savings, not both energy and demand. Please explain.

(b) What are the "optimal IRP levels" and what are the DSM Plan shortfalls in comparison to those optimal levels?

(c) Does E1 accept that the IRP is not a prescriptive document but is a strategic guide for long-term resource requirements?

(d) Given that the IRP is not prescriptive, please explain why the DSM Plan places so much emphasis on matching the IRP?

Response IR-01:

(a) EfficiencyOne (E1) submits that the DSM Plan will direct both energy and demand savings in alignment with the 2020 IRP and notes that exclusion of demand savings in the referenced statement above was an oversight.

(b) The "optimal IRP levels" referenced in the DSM Plan are taken to mean those annual energy efficiency investment levels included in the 2020 IRP Reference Plan as outlined in Table 1 below.

Table 1: DSM Investment Levels included in the 2020 IRP Reference Plan

Year	Investment ($ millions)
2023	$61
2024	$65
2025	$62
Cumulative total	**$188**

(c) E1 considers the IRP to be a rigorous strategic tool to be used in the development, planning and evaluation of supply and demand-side options aimed at providing the lowest cost option in a manner which appropriately balances the interests of ratepayers. E1 believes the IRP has both a short-term and longer-term approach to planning. It is used to develop a plan for procuring energy resources in a manner which minimizes energy costs to customers over both the short- and long-term and must do so in a manner which is consistent with any legislative environmental standards applicable at the time. The latter requirement reflecting the short-term, or immediate, focus of the IRP.

E1 notes this focus was reflected in the 2020 NS Power IRP which identified the priorities as: safety, reliability, affordability, clean energy, and robustness. With regard to the environmental standards considered in the 2020 NS Power IRP, NS Power noted:

*"At its core, the IRP outlines our commitment to supporting provincial decarbonization and providing a clean, reliable energy system at the lowest cost to customers—**in both the near and long term**." (emphasis added)*[1]

(d) In the development of its 2020 IRP, NS Power conducted broad stakeholder engagement through which it identified key priorities to serve as a foundation for the plan including; safety; reliability; affordability; clean energy and robustness.[2] The result of this process was intended to establish a go forward strategy incorporating the identified key priorities – which included affordability.

Given the relatively rapid rate of technological advancement occurring in the Nova Scotia electricity sector, E1 considers near-term modelling results of the IRP to be inherently more reliable than longer-term projections, and therefore can, and should, be relied upon in determining the optimal demand and supply side options within the context of the principles.

To ensure that the IRP remains current with evolving environmental standards and laws, together with other key assumptions included in the IRP process, the 2020 IRP will continue to be updated through an evergreen process moving forward. This process further ensures that the short-term principles and priorities of the IRP remain current with the result that an adherence to both the short-term and long-term results is appropriate. In the short-term, the evergreening process will ensure that the near-term requirements are reflective of current conditions; while over the longer-term, the results will provide a directional path toward optimal supply side and demand-side options.

[1] NS Power website "Powering a Green Nova Scotia, Together" https://irp.nspower.ca/
[2] *Ibid.*

In developing the 2023 – 2025 DSM Plan, E1 believes that it is appropriate to align with the 2020 IRP directionally over the term of the DSM Plan, on the basis that the IRP has incorporated stakeholder input, principles and priorities, consistent with the best interest of Nova Scotia ratepayers.

[Evidence]

Request IR-02:

On p. 4 of 65, E1 stated that the Settlement Plan will "create favorable market conditions for the increased adoption of energy efficient and system-peak demand reduction equipment and upgrades". Please elaborate on how those favorable market conditions will be created by the Settlement Plan.

Response IR-02:

Market conditions include familiarity with, support for, interest in, and access to products and services that achieve energy and/or system peak demand savings. EfficiencyOne influences market conditions through the promotion of individual energy saving programs and practices, and through Enabling Strategies efforts, including education, training, and codes and standards activities.

[Evidence]

Request IR-03:

Page 8 of 65 of the Application references the "lessons learned" from the Covid-19 Pandemic. Please describe these lessons learned and explain how they are implemented into the 2023-25 DSM plan.

Response IR-03:

The COVID-19 pandemic has had a significant impact on participation across programs. EfficiencyOne (E1) responded to various challenges related to the COVID-19 pandemic through modifications to some of its programs, which included appliance pick-ups outside the residence, virtual audits and site visits where possible, increased focus on online retailers for instant rebates, assessments in unoccupied homes, and virtual education and outreach approaches. While no further periods of isolation have been assumed in the 2023-2025 DSM Plan, these alternative approaches to service delivery will continue to be used in 2023 where appropriate; in particular, during any future waves of the COVID-19 pandemic. E1 will continue to explore alternative service delivery approaches such as additional opportunities for virtual and remote audits.

To offset the impact of the COVID-19 pandemic on savings targets, E1 also implemented new pilots in many of its programs that will continue as offerings in the 2023-2025 DSM Plan. Examples of these new pilots include year-round incentives for select measures in Instant Savings, prescriptive rebates for property owners of affordable housing, the Commercial Direct Install pilot, a pay-for-performance pilot and additional focus on compressed air management in Custom, and performance-based incentives for large industrial customers in Strategic Energy Management.

Financial barriers to participation in E1 programs increased with the onset of the COVID-19 pandemic. E1 increased incentives in current program components to provide additional support to participants impacted by the pandemic and encourage uptake. Incentive increases occurred in Appliance Retirement, Instant Savings, Business Energy Rebates, Custom, and Small Business Energy Solutions program components. E1 will continue to assess incentive levels, and whether changes to incentives are required, in accordance with its incentive setting methodology.

The COVID-19 pandemic caused supply-chain issues for many products, which continues into 2022, resulting in delays in the completion of projects. To account for these delays, E1 continues to monitor projects, gather information from customers and contractors and work to adjust project forecasts to address supply-chain challenges. These efforts are expected to continue into 2023, as partners are expecting supply chain challenges to persist into next year.

Throughout the pandemic, safety of participants, partners and staff has remained a high priority. E1 developed protocols for Safe Work Practices for delivery partners and staff. This included requirements for physical distancing, enhanced cleaning, non-medical masks, and other safety measures. These Safe Work Practices are regularly reviewed and updated to reflect the latest guidance from Nova Scotia public health officials. E1 will continue to evaluate and update its Safe Work Practices as the COVID-19 pandemic continues to evolve.

Request IR-04:

On p. 10 of 65, E1 stated that the proposed energy savings of 412.7 GWh reflects about 1.2% of NS Power's load at the generator.

(a) Please provide a similar comparison of peak demand savings.

(b) Please explain whether E1 considers that its mandate requires greater (or equal) emphasis be placed on energy savings or on peak demand savings, and explain how this is addressed in its 2023-2025 DSM Plan.

Response IR-04:

(a) EfficiencyOne's (E1) 2023-2025 DSM Plan included 78.8 MW of peak demand savings from energy efficiency and 17.9 MW of available capacity from demand response. E1 estimates the peak demand savings from energy efficiency to be 3.5% compared to NS Power's 2021 Load Forecast 2025 system peak forecast of 2,257 MW[1]. As part of the demand response (DR) modelling, Guidehouse has estimated the peak demand savings from demand response to be 1.0% of peak load in 2025.

(b) E1's submits that its mandate does not weight energy savings or demand savings more heavily than the other. E1 submits that both energy savings and demand savings from energy efficiency align with the 2020 Integrated Resource Plan (IRP) and the introduction of a demand response program in the 2023-2025 DSM Plan is in response to its inclusion for the first time in the 2020 IRP. E1 further submits that the agreement reached between

[1] M10109. NS Power 2021 Load Forecast Report. April 30, 2021. Page 9 of 89.

E1 and NS Power demonstrates that the Settlement Plan allocation between energy savings and demand savings appropriately balances the interests of the power utility and is in the best interests of the ratepayers.

[Evidence]

Request IR-05:

Referencing p. 10 of 65, E1 stated that the DSM initiatives in the Settlement Plan have an average first year unit cost of $0.39/kWh.

(a) Please provide a table showing the proposed and actual average first year unit costs for each of the past 10 years and explain the factors contributing to year-over-year changes, as well as changes between proposed and actuals.

Response IR-05:

(a) EfficiencyOne (E1) has provided the proposed and actual average first year unit costs in Table 1, below, from 2015 to present. E1 has also provided a summary of E1's investment and savings over the same time period in Tables 2 and 3, as unit cost is a calculation output of investment and savings. Factors contributing to year-over-year changes as well as changes between proposed and actuals are provided below.

Table 1: E1 First-Year Unit Costs from 2015 to Present

First Year Unit Costs ($ / kWh)											
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Approved	0.322	0.250	0.249	0.256	0.268	0.289	0.285	0.323			
Actual / Forecast / Planned	0.232	0.225	0.232	0.224	0.274	0.297	0.329	0.359	0.427	0.379	0.385
Variance to Approved	(0.090)	(0.025)	(0.017)	(0.032)	0.006	0.009	0.044	0.036			
Year Over Year Actual	(0.012)	(0.007)	0.007	(0.008)	0.050	0.024	0.032	0.030	0.068	(0.048)	0.006

Table 2: Energy Efficiency (EE) Investment ($ million) from 2015 to Present

Energy Efficiency Investment ($ million)											
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Approved	39.0	33.2	34.0	34.9	34.1	34.4	34.6	41.0			
Actual / Forecast / Planned	32.0	30.8	30.3	33.9	34.1	28.4	36.0	45.6	51.5	54.0	57.5
Variance	(7.0)	(2.4)	(3.7)	(1.0)	0.1	(6.0)	1.4	4.6			

Table 3: First-Year Energy Savings (GWh) from 2015 to Present

First Year Energy Savings (GWh)											
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Approved	121.2	133.1	136.5	136.3	127.2	119.2	121.5	127.1			
Actual / Forecast / Planned	137.9	136.9	130.7	151.4	124.6	95.5	109.4	127.0	120.7	142.6	149.5
Variance	16.7	3.8	(5.8)	15.1	(2.6)	(23.7)	(12.1)	(0.1)			

The two primary drivers of unit cost changes between proposed and actuals are as follows:

- the level of participation in a program or program component; and
- the mix of products in the programs.

Changes can occur between the time of Plan modelling and Plan implementation in relation to estimates of customer participation and the mix of products within programs. Cost estimates are developed well in advance of actual plan implementation and actual performance can differ from estimates.

On April 21, 2020, E1 filed the findings of a Performance Alignment Study completed by KPMG.[1] This study completed a variance analysis of actual costs and energy savings compared to DSM Plan approved amounts for 2015 and 2016-2018. The study found no evidence of upward bias in E1's estimate of resource costs, that E1 is well-aligned with

[1] M09750, EfficiencyOne Performance Alignment Study, April 21, 2020.

surveyed jurisdictions, and that E1's resource cost development of DSM Plans has demonstrably improved with the organization's maturity. E1 also agreed to enhancements to documentation and enhancements to current reporting as part of a continuous improvement process.

The KPMG report outlined the factors identified in the variance analysis of actual costs and energy savings compared to DSM Plan approved amounts for the 2015, 2016-2018 DSM Plan years. These same factors apply to the unit cost outcomes for these Plan years and the changes between proposed and actuals. E1 has provided a summary of these factors outlined in the KPMG report for the years 2015, and 2016 to 2018, below.

2015

The 2015 DSM Resource Plan was a one-year Continuation Plan. E1 had an underspend of approximately 18% of approved investment and an overachievement in energy savings of 14%, as compared to the approved Plan. This led to a lower unit cost result for 2015 as compared to the approved Plan. As noted in the KPMG report, in 2015, E1 opted to reduce spending to offset HST costs (related to an outstanding ruling on E1's ability to claim Input Tax Credits on HST payments and recover these payments).[2] Another factor that contributed to the underspend was lower incentive costs, a result of lower than anticipated participation in Residential Direct Install and Direct Installation program components. In 2015, several program components also saw an overachievement of energy savings (New Residential, Energy Savings Actions, and Efficient Product Rebates in the Business, Non-Profit & Institutional (BNI) sector. These factors influenced the outcome of the unit cost result in 2015 as compared to the approved Plan.

[2] Ibid, page 32-33

2016[3]

For the 2016 year, E1 had an underspend of approximately 7% of approved investment and overachieved its energy savings by 3% as compared to the approved Plan. This resulted in a lower unit cost result for 2016 as compared to the unit cost in the approved Plan. Higher than expected participation and the measure mix in several program components influenced this result. For example, Instant Savings saw higher than expected customer participation with strong demand for lower unit cost measures such as LED lighting. (Although lighting has a lower energy savings per unit rebated, the higher participation in Instant Savings more than offset the lower energy savings per measure).[4]

2017[5]

In 2017, E1 had an underspend of approximately 11% of approved investment and underachieved energy savings by 4%, as compared to the approved Plan. This led to a lower unit cost result for 2017 as compared to the approved Plan. Factors that contributed to the underspend were related to the measure mix of some program components. For example, within Residential Direct Install (RDI) and Rental Properties and Condos, these program components saw lower energy savings and lower costs related to customer uptake in more lighting measures than anticipated in the Plan. [6]

2018[7]

In 2018, E1 had an underspend of approximately 3% of approved investment and overachieved energy savings by 2% as compared to the approved Plan. Factors that contributed to a lower unit cost result, as compared to the approved Plan, included higher

[3] As noted in the KPMG report, the estimates for the 2016, 2017, and 2018 years are contained within a single Plan (i.e. 2016-2018 DSM Plan) and are outcomes of a single planning process. Ibid, page 5

[4] Ibid, page 40-41
[5] Ibid, page 5
[6] Ibid, page 7
[7] Ibid, page 5

than anticipated participation within the BNI Business Energy Rebates (BER) program and its measure mix (e.g. high demand for LED lighting with a lower unit cost).

2019

The 2019 DSM Resource Plan was a one-year continuation plan. In 2019, E1's spending aligned with the approved Plan investment (i.e. $34.1 million), energy savings were 2% below the approved Plan, and the unit cost result was higher than the approved Plan. Factors that contributed to E1's 2019 unit cost included a change in E1's measure mix in some programs (e.g. higher uptake of non-lighting measures which come at a higher unit cost) and higher than anticipated participation in some programs.

As an example, Residential EPR, saw a higher unit cost result in its program, as compared to the approved Plan and E1's mid-course adjustment, a result of higher than expected uptake of year-round products within the Instant Savings program component and a higher number of appliance replacements in Appliance Retirement (year-round products and replacements have a higher unit cost), in addition to lower than expected sales of low unit cost LED lamps in Instant Savings (these low unit cost items helped to offset products with higher unit costs). The New Residential program component also saw a higher unit cost result in 2019, in part due to higher than anticipated participation in the New Home Construction (NHC) program component. Changes were made in 2018 to increase participation and offer higher tier incentives for high performance homes. As an increased number of smaller homes participated in the program in 2019 with the higher tier incentives, this resulted in a higher unit cost for NHC (the energy savings potential is less in smaller homes, resulting in a higher unit cost for these homes).

The year-over-year increase in unit cost in 2019, as compared to 2018 and prior years, is reflective of E1's efforts to further diversify its portfolio (e.g. non-lighting measures). 2019

was the first year that E1 did not provide rebates on A-Series (LEDs) in response to the transformation of the lighting market.

2020

In 2020, E1 had an underspend of approximately 17% of approved investment and underachieved in energy savings by 20%, a result of COVID-19 pandemic impacts. E1's unit cost result in 2020 was slightly above the approved Plan. This is a result of the measure mix within some of E1's programs. For example, Residential EPR saw a higher unit cost result as compared to the approved Plan, related to the measure mix (e.g. higher than anticipated number of year-round products at a higher unit cost).

2021

In 2021, E1 saw a 4% overspend of approved investment and underachievement in energy savings by 10% compared to the approved Plan.[8] This led to a marginally higher unit cost result for 2021 as compared to the approved Plan. Factors that contributed to this result include:

- The underspend from 2020 was invested in 2021 E1 DSM activities to drive participation and savings results (leading to a higher investment in comparison to the approved Plan). This included increased incentive offerings in several programs (e.g. Appliance Retirement, Small Business Energy Solutions, Business Energy Rebates etc.).
- Lingering impacts caused by the COVID-19 pandemic challenged E1 in meeting its energy savings targets.

[8] As per the First Amending Agreement between Nova Scotia Power and E1, and approved by the NSUARB on November 30, 2020, the allocation of the approved investment amounts in 2021 and 2022 were adjusted. NS Power request, and E1 agreed, that NS power defer $2 million of its payment obligation in 2021 to 2022 (decreasing the investment from $36.6 million, as in the original 2021 Plan as filed, to $34.6 million. See M09096, NSUARB Letter, First Amending Agreement, November 30, 2020.

- The combination of a higher investment and a shortfall in energy savings, contributed to a higher unit cost that the approved Plan.

The changes in unit cost, year over year, from 2015 to present, are reflective of E1's efforts to further diversity its portfolio and measure mix within programs (i.e. introduction of more non-lighting measures, some of which come at a higher unit cost). E1 initiated efforts to diversify its portfolio during the 2016-2018 DSM Plan, and the year-over-year changes from 2019, 2020, and 2021 reflect these efforts.

2023-2025 DSM Plan unit costs are expected to increase from what is forecasted for 2022. Aside from inflationary increases estimated at 4% from 2022 to 2023, the primary driver of this increase is the re-introduction of the Affordable Single-family Home program component where 100% of the cost of the upgrades are included in incentives. The unit cost in 2023 is expected to be the highest of the three years because it includes the last year of the New Home Construction (NHC) program component which is being wound up.

[Evidence]

Request IR-06:

Referencing Table 1 and footnotes on p. 11 of 65, E1 stated that DR only includes E1's required investments but it recognizes that NS Power investments will also be required.

(a) Since the TRC test is meant to include all costs, is it valid to say that the TRC values presented in Table 1 are not accurate?

(b) Has there been any attempt to identify NS Power's DR costs? If not, why not?

(c) Table 1 shows unique peak demand savings associated with each specific year but the Available DR Capacity column appears to build on the previous year's results. Please confirm.

(d) If confirmed, please explain whether the costs used in calculating the TRC ratios for 2024 and 2025 include only incremental DR costs associated with the incremental capacity increases for those years.

(e) Please explain what accounts for the decline in Measure Life from 12.4 years in the 2023 initiatives to 10.8 years in the 2024 initiatives.

Response IR-06:

(a) In Table 1 page 11 of 65 EfficiencyOne's (E1) Evidence, the "Investment" column only includes E1's required investment for Demand Response activities as that is the amount E1 is seeking approval for. All cost-effectiveness screening (including the results presented in

Table 1) includes both E1's costs and an estimate of NS Power's costs to be as accurate as possible in cost-effectiveness testing.

(b) Yes, NS Power's costs related to Demand Response have been estimated by Guidehouse and E1 with input from NS Power. These costs were developed for the purposes of cost-effectiveness testing.

(c) Yes, for Demand Response the total available capacity in each year is presented. This includes capacity installed in previous years that is expected to remain available to the utility for control (accounting for expected program attrition). Demand Response is presented in this way because the total available capacity available is the most meaningful value for resource planning, and because on-going resources are required to maintain capacity acquired in previous years (i.e. annual incentives, measurement and verification, program administration).

(d) For Demand Response cost-effectiveness testing presented in Table 1, page 11 of 65 E1's Evidence, a 10-year program has been used. This fully captures the lifetime costs and benefits of Demand Response over a typical program life. In Table 1, this 10-year cost-effectiveness result is shown in each year (2023-2025). In the cost-effectiveness test calculation, the total available capacity in each year would be used (cumulative impacts rather than incremental), as that is the demand capacity made available to the utility, which creates avoided cost benefits.

(e) Measure life data is only applicable to energy efficiency measures. The decrease in measure life for the portfolio is attributable to the introduction of the Residential Behaviour program component in 2023 and its ramp up in 2024 and 2025. This program component has a measure life of one year and is planned to achieve 8.7 GWh of first-year energy savings in

2023 increasing to 29.8 GWh for each subsequent year, both 2024 and 2025. The increased energy savings year over year causes a decrease to the Existing Residential weighted average measure life from 10.8 years to approximately 7.4 years in 2024 and 7.5 years in 2025, which in turn results in a decrease to the weighted average measure of the portfolio from 12.4 years in 2023 to 10.8 years in 2024.

Request IR-07:

Page 13 of 65 of the Application notes that the 2023-25 DSM plan has applied a design objective of increased investment in development and research specifically targeting innovation.

(a) Please describe the specific innovation that these development and research initiatives are targeting.

(b) How much spending is included in the 2023-25 DSM for 2023, 2024 and 2025 related to research and development initiatives.

(c) Please outlining the expected energy, demand reduction and cost of carbon dollar savings resulting for these research and development initiatives in 2023, 2024, 2025 and over their expected lifetimes.

Response IR-07:

(a) The specific initiatives that will be undertaken through innovation activities have not been developed at this time. These initiatives will be identified as part of EfficiencyOne's annual business planning. Areas of focus are expected to include beneficial electrification, market transformation, deep retrofits, and virtual audits.

(b) The total spending included in the 2023-2025 DSM Plan is $4.5 million with the expectation that $1.5 million will be spent each year.

(c) There are no energy, demand or carbon savings estimated from the research and development initiatives. Part of the design process for new pilots specifically, is to identify

the potential savings from these initiatives before they are integrated within an existing DSM program or are launched as a standalone program component.

[Evidence]

Request IR-08:

Page 13 of 65 of the Application notes that the 2023-25 DSM plan has applied as design objective of increased diversity of energy and demand savings. Please describe this increased diversity compared to E1's 2020-22 DSM Resource plan.

Response IR-08:

In the development of the 2023-2025 DSM Plan, EfficiencyOne (E1) used several design objectives to achieve a balanced portfolio as highlighted on page 13 of E1's Evidence. The 2023-2025 DSM Plan has increased diversity compared to E1's 2020-2022 DSM Resource Plan in the following key areas:

- inclusion of a new whole home low-income homeowner program component (Affordable Single-Family Homes);
- inclusion of a new residential behaviour program component;
- expanded ENERGY STAR® measures list in the Instant Savings program component;
- inclusion of prescriptive rebates in the Affordable Multi-Family Housing program component;
- inclusion of electrician-installed measures in the Efficient Products Installation program component;
- inclusion of a pay-for-performance service in the Custom program component;
- inclusion of a direct install service as part of the Small Business Energy Solutions program component; and
- inclusion of a new demand response program with multiple pathways under both the residential and BNI program components.

[Evidence]

Request IR-09:

Referencing p. 14 of 65,

(a) Please explain the "focused initiatives" in the Settlement Plan regarding "non-electric qualitative benefits" and how that aligns with electricity ratepayer funded DSM.

(b) Please explain why non-electric benefits should be the focus of the DSM Plan when the Board previously stated in M08888 that it did not have jurisdiction to take non-energy impacts into account in cost-effectiveness testing.

Response IR-09:

(a) In addition to energy benefits, DSM measures produce both non-electric and non-energy benefits and costs. Non-electric benefits impact customer fuel consumption from sources other than grid-supplied electricity. Non-energy benefits impact customer non-fuel costs that are affected by the installed measures (e.g. reduced maintenance). The Settlement Plan modelling includes the additional customer cost of biomass for some measures that switch from electricity to biomass (e.g. wood stoves), as well as the customer cost savings from reduced water consumption for some measures (e.g. commercial dishwashers). The additional non-electric fuel cost and reduced water cost are considered in the Total Resource Cost (TRC) and Program Administrator Cost (PAC) calculations. Consideration of the additional non-electric fuel cost is critical to avoid modelling results that unfairly favour fuel switching measures. Throughout the 2023-2025 timeframe, EfficiencyOne (E1) proposes to highlight non-energy benefits through its marketing and customer outreach

efforts. In certain instances, these are more effective drivers of participation than electricity cost savings alone.

(b) The additional non-electric fuel cost and reduced water costs included in the TRC and PAC test calculations have been historically included in E1's DSM Resource Plan applications. Both non-electric fuel costs and reduced water costs represent quantifiable resource impacts, with non-electric fuel costs representing an energy impact, as opposed to a non-energy impact or benefit. E1 submits that the focus of the Vermont Energy Investment Corporation's (VEIC) work in Nova Scotia represented customer-facing non-energy impacts based on the work of Massachusetts and other American jurisdictions, as opposed to resource impacts.

On a Net Present Value (NPV) basis, additional non-electric fuel costs represent 0.4 percent of total avoided costs on an absolute value basis – these impacts are costs and serve to decrease the cost effectiveness of the measures that contain those impacts.

On an NPV basis, water savings represent 0.002 percent of total avoided costs on an absolute value basis.

These non-electric benefits and costs are included for illustrative purposes and do not directly inform the selection of measures or a program design.

[Evidence]

Request IR-10:

Page 15 of 65 of the Application notes that E1 has completed benchmarking to ensure its costs are aligned with other similar industries and organizations. Please provide copies of any such benchmarking studies completed by E1 since April 21, 2020.

Response IR-10:

EfficiencyOne (E1) has not completed any benchmarking studies, except for compensation, since April 21, 2020, primarily due to the impacts of the COVID-19 pandemic.

E1 completes research to ensure staff compensation is consistent with the market. Annual compensation market data sources such as Mercer Compensation Planning Survey, Conference Board of Canada Compensation Planning Outlook, and Morneau Shepell Human Resource Trends Report are used to inform annual staff increases. In addition, every three-to-five years, E1 carries out primary market research to ensure the organization's compensation framework is aligned with the Nova Scotia labour market. E1's most recent compensation benchmarking study was carried out by Knightsbridge Robertson Surette (KBRS) in late 2020 and early 2021. The final report of this study, dated May 23, 2021, is provided as Attachment 1 of this IR response as Nova Scotia Utility and Review Board (NSUARB) only confidential.

E1 Responses to Nova Scotia Utility and Review Board (NSUARB) Information Requests
NON-CONFIDENTIAL

Request IR-11:

Page 15 of 65 of the Application notes that E1 has conducted third-party independent audits and reviews to ensure that the organization's key controls are operating effectively and that the reporting of financial and energy savings results are accurate. Please provide copies of these reviews and audits.

Response IR-11:

EfficiencyOne (E1) has engaged third-party consultants to conduct the evaluation of energy savings and the audit of financial statements since 2010. The evaluation reports are filed with the Nova Scotia Utility and Review Board by March 31st of each year and the financial statements, which include an Independent Auditor's Report, by April 25th of each year.

E1 introduced an internal audit function in 2013. Since 2020, as a result of the COVID-19 pandemic, no new internal audits have been conducted. Remediation testing was completed in February 2022 on the 2018 Internal Audit - Internal Audit of Privacy Internal Audit Report – Residential Customer Personal Information. Please refer to Attachment 1 of this IR response for the remediation testing results.

KPMG

EfficiencyOne

Privacy Impact Assessment – Remediation Follow-up Review

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February 25, 2022

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KPMG

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Executive summary

Background

KPMG was engaged by EfficiencyOne in 2018 conduct a privacy assessment to identify whether EfficiencyOne's current practices for handling residential customer personal information (referred to as "PI" in this report) support its compliance with the Personal Information Protection and Electronic Documents Act (PIPEDA) and the Canadian Anti-Spam Legislation (CASL).

The 2018 review identified nine observations and nine process improvement opportunities (PIOs) as communicated to management in our *Residential Personal Information – Privacy Internal Audit* report dated November 29, 2018.

Assessment objectives and scope

KPMG was engaged in November 2021 to conduct a follow-up review and assess the remediation and safeguards implemented by EfficiencyOne to address each of the privacy risks identified from the November 2018 internal audit. The scope was limited to an assessment of the remediation status performed by management. Our engagement did not include a detailed re-assessment of all applicable privacy safeguards implemented by EfficiencyOne management.

Overall findings

Based on the results of our assessment, we noted that EfficiencyOne established a formal action plan to address each of our observations and PIOs, and has implemented a number of controls and processes to remediate the identified gaps. EfficiencyOne has established a comprehensive security testing program, enhanced collaboration and technology governance between IT and marketing stakeholders, expanded its security policy coverage and transformed to a more modernized technology infrastructure.

Specifically, we have noted that:

- Fourteen of the original 18 items reported to management have been fully remediated
- Two items have been partially remediated
- Two items have not yet been remediated
- One new moderate risk and three new PIOs have been added for risks we noted during this review.

Through our work we understand that EfficiencyOne management is in the process of defining remediation approaches for the remaining open items based on the recommendations within this report.

KPMG

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Remediation Summary

The following table outlines the status of each observation and PIO, organized by risk level as noted in our follow-up review. Please refer to **Appendix A** for the risk classification level criteria used for each observation.

Observation Name	Original risk rating	Status
3.1 Access controls	High	Remediated + new moderate risk
3.2 Vulnerability scanning and penetration testing	High	Remediated
3.3 PI encryption at-rest	High	Remediated
3.4 Information security policy framework formality and enforcement	Moderate	Remediated + new PIO
3.5 Security monitoring in the EfficiencyOne hosted IT environment	Moderate	Partially remediated
3.6 Segregation of duties for website developers	Moderate	Remediated + new PIO
3.7 Compliance monitoring for agents	Low	Remediated + new PIO
3.8 Security of service account credentials with access to the corporate data warehouse	Low	Remediated
3.9 Redaction of social insurance numbers	Low	Remediated
Process Improvement Opportunities	**Original risk rating**	**Status**
PIO-1 Potential for retaining PI longer than needed	PIO	Not remediated
PIO-2 Lack of coordination between the IT and Marketing departments on technology system management and protection	PIO	Remediated
PIO-3 Alignment to upcoming privacy breach notification requirements	PIO	Remediated
PIO-4 No consent withdrawal procedure	PIO	Not remediated
PIO-5 Use of multiple ticketing systems without a centralized view	PIO	Remediated
PIO-6 Unapproved software in use by IT administrators	PIO	Remediated
PIO-7 Outdated technical documentation	PIO	Remediated
PIO-8 No offsite backup or disaster recovery capabilities for PI hosted in a third party datacenter	PIO	Partially remediated
PIO-9 Lack of specificity in safeguards in the privacy policy	PIO	Remediated

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Detailed follow-up results

Detailed follow-up review findings

The following tables show the details of each observation and PIO from KPMG's 2018 privacy assessment, as well as the remaining gaps, recommendations and the residual risk level for each gap we noted during the follow-up review.

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.1 (high risk)	Access controls	While EfficiencyOne has developed various appropriate logical access controls, we noted several examples where the application of the controls was inconsistent, particularly with third party IT providers, resulting in a risk to EfficiencyOne related to unauthorized access to PI.	Remediated + new moderate gap	While EfficiencyOne has addressed the original recommendations and formally defined and implemented an access review process, we noted that the review is only performed once annually and that access for one sampled departure was not removed in a timely manner where access was terminated two business days after departure.	EfficiencyOne should consider performing access and permissions reviews more frequently to align with the rate of turnover for personnel and frequency of permissions changes. EfficiencyOne should also consider enforcing more timely removal of access to become immediately upon termination of personnel.		

Management response	Management agrees with the new moderate gap and recommendations identified by KPMG. Moving forward EfficiencyOne will be conducting account and access control reviews at the end of each quarter, starting in Q2, 2022.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.2 (high risk)	Vulnerability scanning and penetration testing	While EfficiencyOne agrees that vulnerability scanning and internal vulnerability assessment and management processes to identify any vulnerable software or misconfigurations is important, they are currently engaging an external consultant to perform future vulnerability scanning as they do not have these capabilities in-house.	Remediated	N/A	N/A	N/A	N/A
Management response	N/A						

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.3 (high risk)	PI encryption at-rest	While EfficiencyOne encrypts PI received from NSPI, we have noted improvements in the encryption key management practices and encryption of the remainder of PI stored by EfficiencyOne to ensure that all PI is encrypted at-rest and associated encryption keys are adequately protected.	Remediated	N/A	N/A	N/A	N/A
Management response	N/A						

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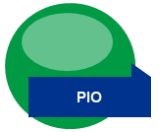
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.4 (medium risk)	Information security policy framework formality and enforcement	EfficiencyOne operates using a mix of formal and informal IT policies, which includes a well-defined privacy policy, but does not cover all domains of information security and is not consistently applied across the entire IT environment.	Remediated + new PIO	EfficiencyOne does not currently collect an annual acknowledgement for its Privacy Policy from users with access to personal information.	As part of continual improvement efforts, EfficiencyOne should consider obtaining annual acknowledgement for EfficiencyOne's Privacy Policy from users with access to personal information.		

Management response	Management agrees with the new PIO recommendation from KPMG. EfficiencyOne has implemented an annual employee acknowledgment of our Privacy Policy, commencing in March of 2022.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.5 (medium risk)	Security monitoring in the EfficiencyOne hosted IT environment	While EfficiencyOne leverages system health and security monitoring for its online environment, this does not extend to non-cloud systems hosted by the third party provider.	Partially remediated	While EfficiencyOne has made major improvements to its security safeguards, we noted that there is no security information and event management (SIEM) solution in place to aggregate and correlate event logs from the various components in EfficiencyOne's cloud environments (Azure for corporate systems and AWS for the websites). This type of security solution is intended to detect suspicious activity across a network/cloud environment and alert security personnel in real-time.	EfficiencyOne should consider expanding security monitoring capabilities to more comprehensively cover the cloud environments and offer timely alerting for suspicious activity detected within these environments.		

Management response	Management acknowledges KPMG's recommendation. EfficiencyOne intends to conduct a pilot to evaluate Microsoft Sentinel and in coordination with our web services provide Arrivals & Departures, AWS GuardDuty for additional telemetry monitoring, starting Q3, 2022.

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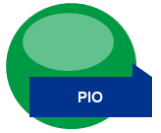
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.6 (medium risk)	Segregation of duties for website developers	While EfficiencyOne controls the flow of changes to its online environment through ticketing and formal approvals, there is no segregation of duties or additional monitoring for developers with access to production and non-production environments.	Remediated + new PIO	While EfficiencyOne has implemented a good change control process for website changes, we noted that there is no compensating control for the development and implementation of EfficiencyOne's websites. Currently, there is one lead developer with full access to all environments, with a backup developer available for continuity purposes. There is no compensating review control to monitor changes being made to EfficiencyOne's websites and ensure that they followed the change management process.	As part of its continual improvement efforts, EfficiencyOne should consider establishing a monthly change review process where segregation of duties for website changes is not feasible, which includes retroactively reviewing technical evidence of changes made to websites and relating them to approved change tickets.		

Management response	Management acknowledges KPMG's new PIO. EfficiencyOne is currently refining its existing change and approval process to include a retroactive review of website change evidence relative to what had been approved.

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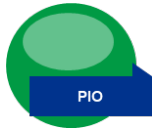
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.7 (low risk)	Compliance monitoring for agents	While EfficiencyOne captures the required consent to enable them to leverage third parties for service delivery and has included a contractual requirement for agents to follow PIPEDA, it does not routinely receive assurance of or monitor the compliance of agents against these agreed-to contractual requirements for the handling and security of PI.	Remediated + new PIO	While EfficiencyOne has obtained written confirmation from its agents acknowledging their understanding and commitment to compliance with PIPEDA, we observed that that two sampled agent websites such as the such as energy assessment request forms, did not include a privacy disclosure, policy or consent confirmation on forms that collect personal information.	As part of continual improvement efforts and its role in championing privacy for its customers, EfficiencyOne should consider promoting privacy best practices to agents that its customers are re-directed to.		

Management response	Management agrees with the new PIO from KPMG. EfficienyOne's Privacy Officer will meet with each of EfficienyOne's Delivery Agents to review PIPEDA requirements with them and make sure the required safeguards are implemented, including but not limited to, having a clear privacy policy, using website certificates, not using customer information for undisclosed use-cases.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.8 (low risk)	Security of service account credentials with access to the corporate data warehouse	While it is not standard practice at EfficiencyOne, there is an instance where a service account exists in the corporate data warehouse with access to PI through an embedded Excel macro.	Remediated	N/A	N/A	N/A	N/A

Management response	N/A

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
3.9 (low risk)	Redaction of social insurance numbers	While EfficiencyOne has appropriate physical security safeguards for paper forms, the method for redacting social insurance numbers does not fully render them irrecoverable.	Remediated	N/A	N/A	N/A	N/A

Management response	N/A

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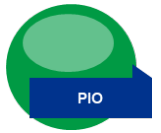
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-1	Potential for retaining PI longer than needed	While we have not identified a specific instance where PI is retained beyond the use-cases disclosed during consent collection, we understand that EfficiencyOne may run into a scenario where a particular data subject has withdrawn consent for promotional communications and is no longer a consumer of EfficiencyOne's services directly. In that scenario, EfficiencyOne may retain PI beyond the timeframe for which it is needed for the potential PI use-cases disclosed when consent is granted. EfficiencyOne should review the use-cases, specifically where email communications consent is withdrawn through the Canadian Anti-Spam Legislation 'CASL' form and the data subject is no longer a direct consumer of EfficiencyOne services. For each applicable data subject's case, EfficiencyOne should validate that at least one or more use-cases are still valid to allow EfficiencyOne to continue to store and use such PI.	Not remediated	There is no formal records retention and destruction schedule that is agreed with Nova Scotia Power. Typically, such a schedule would define the approach to retaining personal information, destroying versus de-identifying information, and how to handle data subject requests to be forgotten.	EfficiencyOne should establish its own records retention and destruction requirements/schedule and consult with Nova Scotia Power on the specifics for the personal information they provide to EfficiencyOne.		

Management response	Management is consulting with legal counsel to determine an appropriate approach for EfficienyOne to take with respect to records retention and destruction requirements/schedule, and will determine the next steps on this issue based on the outcome of these consultations.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-2	Lack of coordination between the IT and Marketing departments on technology system management and protection	During the course of our fieldwork, we noted that the IT environment is operated in two 'silos' where the IT Department is responsible for IT infrastructure, end-user services and corporate business applications, and the Marketing Department is responsible for EfficiencyOne's online presence and cloud-based solutions. These two departments operate independently and minimal coordination of activities and control processes exists between the two. EfficiencyOne should consider implementing a more holistic structure that provides management with a single view of their IT environment and footprint, including maintaining regular communications on planned changes, security requirements, incidents, etc.	Remediated	N/A	N/A	N/A	N/A

Management response	N/A

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-3	Alignment to upcoming privacy breach notification requirements	EfficiencyOne's breach notification procedures do not include notifying the Office of the Privacy Commissioner in the event of an actual breach, which will be a requirement in the upcoming changes to PIPEDA requirements (planned for November 2018). EfficiencyOne should consider aligning its defined breach notification requirements to include notifying the Office of the Privacy Commissioner to align with these upcoming changes to PIPEDA requirements.	Remediated	N/A	N/A	N/A	N/A
Management response		N/A					

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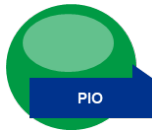
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-4	No consent withdrawal procedure	EfficiencyOne does not have a defined procedure to handle consent withdrawal requests. While we understand that there have been no instances of consent withdrawal, EfficiencyOne should nevertheless maintain a procedure for deletion of PI records across all physical and digital records, including steps to identify all the locations of the data subject's PI to ensure timely deletion.	Not remediated	We understand that EfficiencyOne currently retains personal information to fulfill its mandate but does not have a formal response to provide to data subjects when they request to be forgotten, which would typically outline the business reasons for retaining personal information. We understand that there is currently an approach and capability for de-identification; however it would have to be expanded to include personal information records being retained after a specific period of time or after a customer requests to be forgotten.	EfficiencyOne should seek a formal legal opinion to provide justification for declining requests to delete personal information records upon request by data subjects. If the legal review identifies that records should be destroyed upon request or in specific circumstances, EfficiencyOne should consider maintaining a procedure for deletion or de-identification of PI records across all physical and digital records, including steps to identify all the locations of the data subject's PI to ensure timely deletion.		

Management response	Management is consulting with legal counsel to determine an appropriate approach for EfficienyOne to take with respect to consent withdrawal procedure, and will determine the next steps on this issue based on the outcome of these consultations.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-5	Use of multiple ticketing systems without a centralized view	EfficiencyOne uses multiple ticketing systems to track 'access' and 'change' requests, i.e., 'Zendesk', 'Footprints' and 'JIRA', which does not provide a centralized view of all changes occurring across the IT environment. As some of these changes could inadvertently impact the systems hosting PI, it would be prudent for EfficiencyOne to understand all changes and any potential PI system impact. EfficiencyOne should consider centralizing all ticketing systems and ensure sufficient visibility of all changes occurring across its IT environment.	Remediated	N/A	N/A	N/A	N/A
Management response	N/A						

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-6	Unapproved software in use by IT administrators	We noted that an administrative user had 'The Onion Router' (TOR) browser, which is used to obfuscate network traffic, installed on their machine. We did not attempt to verify whether a TOR connection would be successful however, EfficiencyOne should investigate this further and ensure TOR connections are not technically possible to make and also review technical restrictions placed on installing unauthorized software such as the TOR browser.	Remediated	N/A	N/A	N/A	N/A
Management response	N/A						

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-7	Outdated technical documentation	Up-to-date technical documentation is not maintained across the EfficiencyOne IT environment, e.g., network and application architectures, and we noted that such documentation was created/updated upon request for our fieldwork over the scope of residential customer PI only. We noted that there is no process in place to regularly perform updates or track configuration details in near-real time, e.g., through a configuration management database (CMDB). EfficiencyOne should consider implementing a CMDB to track assets, their configurations and their interrelationships, and maintain up-to-date technical documentation to assist with both IT operations and also with security incident response.	Remediated	N/A	N/A	N/A	N/A

Management response	N/A

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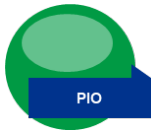
Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-8	No offsite backup or disaster recovery capabilities for PI hosted in a third party datacenter	There is no offsite backup for all PI hosted at the 'Rogers' datacenter, and there is no disaster recovery testing for the secondary site which is designated for recovery of EfficiencyOne's systems that are currently hosted at the primary 'Rogers' datacenter. Additionally, disaster recovery procedures in place at EfficiencyOne rely on a different 'Rogers' backup facility and as such are now outdated given the change in facility. Without having offsite backups for such PI, there is a risk that if a loss event were to occur, e.g., due to a natural disaster or targeted attack, the PI would be entirely irrecoverable. EfficiencyOne should consider establishing a backup strategy to maintain at least one offsite copy of PI, update disaster recovery procedures to leverage offsite backups and conduct a test of the disaster recovery procedures/plan to verify its effectiveness.	Partially remediated	While a disaster recovery plan has been documented, it has not yet been tested to confirm recovery capabilities in a realistic simulation/test. Additionally, there is no regular cadence for backup restoration testing or disaster recovery testing of EfficiencyOne's websites with the service provider (A&D).	EfficiencyOne should define a testing schedule, e.g., annually, to perform a full DR test and incremental tests once changes are made to validate its recovery capabilities. Smaller-scale tests should also be performed, such as testing backup restoration capabilities with A&D.		

Management response	Management agrees with the remaining gap and recommendations identified by KPMG. EfficiencyOne has established a work plan for incremental (Q2) and full DR backup testing (Q4) internally and externally by our web services provider Arrivals & Departures.

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Detailed follow-up review findings

ID #	Original finding	Original Finding Description	Status	Remaining gaps	Recommendations	Residual risk level	Suggested timeframe
PIO-9	Lack of specificity in safeguards in the privacy policy	There is no specific mention of a policy structure in the public privacy policy other than the 'affiliate' Code of Conduct. A more fulsome description would better meet PIPEDA requirement (4.8). Additionally, the internal/external EfficiencyOne privacy policies only state that "EfficiencyOne has physical and technological security safeguards and procedures in place to protect clients' Personal Information from unauthorized access, disclosure, use, or modification." which does not describe in general terms what safeguards will be applied (GAPP 8.1.1). EfficiencyOne should consider updating this information to describe in general terms the safeguards and policy framework it has implemented to protect PI.	Remediated	N/A	N/A	N/A	N/A

Management response	N/A

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Appendices

Appendix A - Classification of observations

Rating	Definition	Action(s) required
Critical	Issue represents control weaknesses, which could cause or is causing severe disruption of the process or severe adverse effect on the ability to achieve objectives	– Requires immediate notification to the Finance Committee (FC) – Requires Senior Management attention – Separately reported to Chairman of the FC and executive summary of report
High	Issue represents a control weakness, which could have or is having major adverse effect on the ability to achieve objectives	– Requires prompt management action – Requires Senior Management attention – Reported in executive summary of report
Moderate	Issue represents a control weakness, which could have or is having significant adverse effect on the ability to achieve objectives	– Requires short-term management action – Requires general management attention – Reported in executive summary of report
Low	Issue represents a minor control weakness, with minimal but reportable impact on the ability to achieve objectives	– Requires management action within a reasonable time period – Requires process manager attention – Reported in executive summary of report
PIO	PIO (Process Improvement Opportunity) represents an identified business process area where an opportunity is present to implement a change in the process that improves efficiency, effectiveness and/or alignment with organizational objectives	– Requires management consideration within a reasonable time period – Requires business process manager or supervisor attention – Reported in a memo to EfficiencyOne Management

Rating	Definition of mitigation timeline
Immediate	The proposed mitigation timeline for these risks requires immediate action by EfficiencyOne Management
90 days	The proposed mitigation timeline for these risks requires action by EfficiencyOne Management within 90 days
3-6 months	The proposed mitigation timeline for these risks requires action by EfficiencyOne Management within 3-6 months
6-9 months	The proposed mitigation timeline for these risks requires action by EfficiencyOne Management within 6-9 months
9-12 months	The proposed mitigation timeline for these risks requires action by EfficiencyOne Management within 9-12 months

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Appendix B - Restrictions and Disclaimer

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This report has been prepared by KPMG LLP ("KPMG") for the internal use of the EfficiencyOne pursuant to the terms of our engagement agreement with EfficiencyOne dated September 1, 2021 (the "Engagement Agreement"). This report is being provided to EfficiencyOne on a confidential basis and may not be disclosed to any other person or entity without the express written consent of KPMG and EfficiencyOne. KPMG neither warrants nor represents that the information contained in this report is accurate, complete, sufficient or appropriate for use by any person or entity other than EfficiencyOne or for any purpose other than set out in the Engagement Agreement. This report may not be relied upon by any person or entity other than EfficiencyOne, and KPMG hereby expressly disclaims any and all responsibility or liability to any person or entity other than EfficiencyOne in connection with their use of this report.

This report is intended solely to assist EfficiencyOne with reviewing the design and implementation of controls related to the protection and use of personal information as outlined in CASL and PIPEDA. The comments and observations in our report are not intended, nor should they be interpreted, to be legal advice or legal opinion.

We had access to information up to December 17, 2021 in order to arrive at our observations but, should additional documentation or other information become available which impacts upon the observations reached in our report, we will reserve the right, if we consider it necessary, to amend our report accordingly. This report and the observations and recommendations expressed herein are valid only in the context of the whole report. Selected observations and recommendations should not be examined outside of the context of the report in its entirety.

This report has been prepared by KPMG at the request of EfficiencyOne in our capacity as internal auditors in accordance with the terms and limitations set out in our engagement contract. The information presented in this report has been prepared by KPMG from information provided by EfficiencyOne. KPMG has relied upon the accuracy and completeness of this information, and has not independently verified it, except to the extent specified in this report. KPMG may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement this report.

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Request IR-12:

Page 15 of 65 of the Application notes that E1 is taking a strategic approach to process improvement with the implementation of an "industry leading methodology" to maximize cost-effectiveness.

(a) Please confirm that this methodology is use of the TRC and PAC Test.

i) If not confirmed, please describe the methodology.

(b) Please explain how this methodology has led to E1 "process improvement".

Response IR-12:

(a) EfficiencyOne (E1) introduced the Lean Six Sigma continuous improvement methodology as the approach to guide process improvement within the organization in 2016. This is not related to either the Total Resource Cost (TRC) or Program Administrator Cost (PAC) test methodology.

i) Lean Six Sigma focuses on using data to identify and eliminate inefficiencies and waste through a five-phase approach referred to as DMAIC. This includes the following steps:

- Define the problem or opportunity;
- Measure process performance;
- Analyze the process to determine root causes of waste and inefficiency;
- Improve process performance by eliminating causes of waste and inefficiency; and
- Control to ensure process performance is maintained.

(b) Lean Six Sigma improvement activities carried out by E1, during 2021, were related to six program components projects where cycle times were reduced by an average of 47%. The program components involved were:

- Custom New Construction – 57% reduction in days from model submission to Custom Project Agreement issued;
- Custom Retrofit – 66% reduction in days from Initial Study Submission to Custom Project Agreement issued;
- Small Business Energy Solutions – 31% reduction in days from applications sent to applications processed;
- Business Energy Rebates – 58% reduction in days from when mail in application was received to claim date;
- HomeWarming – 11% reduction in application lead time; and
- New Home Construction – 60% reduction in days from invoice received to cheque requisition.

[Evidence]

Request IR-13:

Page 16 of 65 of the Application - Avoided Costs:

(a) Please explain why the avoided costs of energy and capacity are 30% and 41% lower, respectively, than in the 2014 IRP.

Response IR-13:

(a) EfficiencyOne (E1) has relied on the avoided costs of energy, capacity, transmission and distribution as developed by NS Power and which have been subject to stakeholder review and discussion. E1 does not have access to all source data or the Integrated Resource Plan (IRP) model used in their development. As such E1 has not been able to perform any independent analysis of the differences between the avoided costs seen in the 2020 IRP compared to the 2014 IRP or the differences between individual years seen in the 2020 IRP results. Neither has E1 performed an analysis on the sensitivity of NS Power's avoided costs to any specific fuel types or how they compare to marginal costs used by NS Power to set specific rates.

While E1 has not been in a position to perform the analyses described above E1 understands that avoided costs have historically been a substantial topic of discussion in relation to DSM Plans as they are used to calculate the benefits of DSM. Recognizing this critical component of DSM planning, E1 undertook a rigorous stakeholder engagement process with the DSM Advisory Group (DSMAG) on avoided costs specifically as part of the 2023-2025 DSM Plan development process and has included additional detail on the avoided costs used in the development of the 2023-2025 DSM Plan in its Application.

The stakeholder engagement on avoided costs for use in the 2023-2025 DSM Plan was initiated in March of 2021 with a DSMAG technical session. In addition to the general DSM planning stakeholder engagement through the DSMAG, EfficiencyOne engaged in specific sessions dedicated to a review of avoided costs in aid of the development of the 2023-2025 DSM Plan:

- March 3 to March 26, 2021: Additional information requested, and questions posed by stakeholders. Responses circulated to stakeholders.
- April 7, 2021: Formal written stakeholder comments received from Synapse and NS Power.
- May 25, 2021: NS Power circulated their response to Synapse's comments regarding energy and capacity avoided costs to the DSMAG.
- May 28, 2021: Second avoided costs session with the DSMAG.
- May 28 to June 18, 2021: Additional information requested from NS Power and responses circulated to stakeholders.
- June 25, 2021: NS Departments of Energy and Environment (DoE&E) led a meeting with E1, NS Power, Synapse, and Resource Insight, Inc. (RII) on the avoided cost of carbon, specifically the federal and provincial intent beyond 2022.
- June 27 & 28, 2021: Written comments received from RII and NS DoE&E.
- July 21, 2021: Written comments received from NS DoE&E.
- July 22, 2021: Meeting with E1, Synapse, and RII to gain better understanding of positions on avoided cost of carbon.
- July 22 to August 20, 2021: Additional information requested, and questions posed by stakeholders. Responses circulated to stakeholders.
- October 12, 2021: Meeting with E1, Synapse, and RII to discuss additional questions and responses.

The DSM avoided costs used in the development of the 2023-2025 DSM Plan included for energy efficiency, demand response and the rate and bill impact analysis are provided below in Table 1.

Table 1: 2023-2025 DSM Plan Avoided Costs Categories

Avoided Costs Category	Energy Efficiency Process Model	Demand Response DRSim Model	Rate and Bill Impact Analysis (RBIA)
Energy	X		X
Capacity	X	X	X
Transmission	X	X	X
Distribution	X	X	X
Carbon	X		X

Historically E1 has used the DSM avoided costs provided by NS Power in development of its DSM Plans. For the 2023-2025 DSM Plan, the most current avoided costs of energy and capacity were developed and provided by NS Power as an outcome of the 2020 Integrated Resource Plan (IRP) using the selected Reference Plan (scenario 2.0C).

The most current avoided costs of transmission and distribution (T&D) available to E1 for the development of the 2023-2025 DSM Plan were provided by NS Power in April 2021. For the 2023-2025 DSM Plan, E1 extrapolated these avoided costs using a 2 percent annual inflation rate to produce a stream of annual values. Please refer to the response to NSPI IR-01 as issued by the IG.

E1 calculated the avoided costs of carbon using NS Power's 2020 IRP Reference Plan (scenario 2.0C).

For additional detail on avoided costs methodology and values used in the development of the 2023-2025 DSM Plan please refer to E1's 2023-2025 DSM Resource Plan, Appendix A, Attachment 2: Avoided Costs Brief.

As described above and more fully in the Avoided Costs Brief (Appendix A, Attachment 2 of E1's 2023-2025 DSM Resource Plan), the avoided costs of energy, capacity and carbon were developed based on the 2020 IRP Reference Plan (scenario 2.0C). As required in the Standardized Filing Framework, E1 uses the IRP Reference Plan to inform the development of DSM Plan. E1 has no knowledge whether a "no-DSM" scenario for 3.1C or 3.2C from the 2020 IRP has been developed for the purpose of allowing NS Power to develop DSM avoided costs based on either of these scenarios. No information of this nature was provided to E1 by NS Power. Consequently, E1 did not have this data available for the development or consideration of the 2023-2025 DSM Plan. E1 does understand based on NS Power's IRP Action Plan Update filed in January 2022 and their subsequent stakeholder workshop that they will be undertaking a 2022 IRP Evergreen process in 2022. In E1's comments to NS Power on the study scope and timelines submitted on April 15, 2022, E1 requested the following:

"…that the Study Scope include the following deliverables as part of the Evergreen IRP process:

- *Evergreen IRP 2022 Reference Plan;*
- *Updated avoided costs of DSM using the aforementioned 2022 Reference Plan; and*
- *Fulsome stakeholder engagement process for the development of updated avoided costs of DSM."*

E1 anticipates that these items will be examined through the 2022 IRP Evergreen process with the expectation that there will be opportunity for fulsome stakeholder engagement and review of these costs.

Request IR-14:

On p. 17 of 65, E1 stated that it has expanded investment in programs that target low income customers such that low income investment amounts to 21% of the total investment.

(a) Please provide the actual amount of low income investments in each year from 2012 to 2021 inclusive, as well as the percentage of total investment.

(b) Please explain E1's involvement, and any coordinated effort, in the low income initiatives undertaken within the $37 million, 10-year funding contribution provided by NS Power's shareholder. If known, please provide the annual amount of spending under that program.

Response IR-14:

(a) EfficiencyOne (E1) began reporting low-income results in 2015. Please refer to E1's response to Synapse IR-02.

(b) Please refer to E1's response to NSUARB IR-27.

Request IR-15:

On p. 21 of 65, E1 stated that "The additional non-electric fuel cost and reduced water cost are considered in the TRC and PAC calculations." Please explain how that comports with the Board Decision in Matter M08888 [2020 NSUARB 56] which stated, "The Board does not have the jurisdiction to take into account non-energy impacts in cost-effectiveness testing."

Response IR-15:

Please refer to part (b) of EfficiencyOne's response to NSUARB IR-09.

[Evidence]

Request IR-16:

On p. 34 of 65, E1 compares NS Power's 2021 fuel cost of $0.075/kWh to the DSM lifetime unit cost of $0.035/kWh and states that DSM cost is less than the average cost of fuel by $0.039/kWh. However, Table 4 on page 35 shows the 2021 cost difference as $0.052/kWh. Please explain why those values are different.

Response IR-16:

On page 34, lines 20 and 21, EfficiencyOne (E1) is referencing the difference between the 2023-2025 Settlement Plan's lifetime unit cost of $0.035/kWh and NS Power's 2021 fuel cost of $0.075/kWh. E1 referenced the 2021 fuel costs since it was the most recent comparator data publicly available from NS Power for the 2023-2025 time period. In Table 4 (Evidence, page 35 of 65) of E1's 2023-2025 DSM Plan Application, E1 compares the lifetime unit cost of the 2021 forecasted results of $0.023/kWh to the same NS Power's 2021 fuel cost of $0.075/kWh resulting in the difference of $0.052/kWh.

Request IR-17:

On p. 37 of 65, E1 stated that Massachusetts, Vermont, and Maine are the most direct comparisons to Nova Scotia on the basis of climate, heating and cooling cycles, and fuel sources.

(a) Please provide details of those specific comparators.

(b) Please provide details comparing number of customers, peak demand, annual energy, and annual electricity revenue.

(c) Please provide a breakdown of generation/imports by resource type for each of those jurisdictions in comparison to Nova Scotia.

(d) Please indicate whether the electricity efficiency programs in those jurisdictions are fully funded by electricity ratepayers. If not, please explain any external funding sources.

(e) Please explain whether those states are required to meet legislated requirements similar to NS Power regarding renewable electricity as a percent of sales and the elimination of coal-fired generation plants.

Response IR-17:

(a) Please refer to Attachment 1, ACEEE's *The 2020 State Energy Efficiency Scorecard*, and Attachment 2, ACEEE's *Entire State Database* of this IR response.

Aside from climate similarities that each of Maine, Vermont, and Massachusetts offer as Northeast/New England States, and heating and cooling considerations that are comparable to Nova Scotia as a result, additional data and information worthy of comparison include population, energy efficiency (EE) spending, total electricity revenue, and related DSM performance metrics.

i) Population (per 2020 U.S. Decennial Population Census Data and 2021 Statistics Canada Census of Population Data – Nova Scotia):
   a. Maine – 1,362,359
   b. Massachusetts – 7,029,917
   c. Vermont – 643,077
   d. Nova Scotia – 969,383

ii) Total annual EE spending:
   a. Maine – $45.9M
   b. Massachusetts – $620.4M
   c. Vermont – $55.2M
   d. Nova Scotia – $34M (2020); 35M (2021)

iii) Per capita annual EE spending (not based on the above Census data with the exception of Nova Scotia):
   a. Maine – $34.12/person
   b. Massachusetts – $90.02/person
   c. Vermont – $88.46/person
   d. Nova Scotia – $35.07/person (2020); $36.11/person (2021)

iv) EE spending as a percentage of electricity revenue:
   a. Maine – 2.76%
   b. Massachusetts – 6.29%
   c. Vermont – 6.59%
   d. Nova Scotia – 1.8% (2020); 2.3% (2021)

v) Total electricity revenue (approximate derived values):
   a. Maine – $1.66B
   b. Massachusetts – $9.86B
   c. Vermont – $837.6M
   d. Nova Scotia – $1.5B

vi) Incremental net savings in 2019 (2020 and 2021 for Nova Scotia):
   a. Maine – 127,786 MWh
   b. Massachusetts – 1,199,409 MWh
   c. Vermont – 117,289 MWh
   d. Nova Scotia – 119,200 MWh (2020); 121,500 MWh (2021)

vii) Net savings as a percentage of retail sales:
   a. Maine – 1.03%
   b. Massachusetts – 2.25%
   c. Vermont – 2.12%
   d. Nova Scotia – 1.1% (approved level from 2019 through 2022)

(b) Please refer to part (a) of this IR response.

(c) The United States Energy Information Administration published the following generation and import information for 2019/2020[1]. Recent data from January 2022 is also included.

Maine[2]

i) In 2020, 79% of Maine's electricity net generation came from renewable energy, with hydroelectric power, wind power, and biomass (mostly wood and wood-derived fuels) accounting for 34%, 24%, and 20%, respectively.

[1] *Homepage - U.S. Energy Information Administration (EIA)* (2022). Available at: https://www.eia.gov/
[2] *Maine Profile* (2022). Available at: https://www.eia.gov/state/print.php?sid=ME

ii) 60% of households use fuel oil as their primary heating source.

iii) 2020 net generation – 10,001,870 MWh

- Electric utilities – 2,914 MWh
- Independent Power Producer (IPP) and Combined Heat and Power (CHP) – 9,998,956 MWh

iv) In January 2022, net electricity generation by source was as follows:

- Petroleum-fired – 155,000 MWh
- Natural Gas-fired – 308,000 MWh
- Coal-fired – 5,000 MWh
- Hydroelectric – 256,000 MWh
- Non-hydroelectric renewables – 479,000 MWh

v) In 2019, Maine imported almost 30% of its electricity from Canada.

vi) Net electricity imports consumption: 13.7 trillion British Thermal Units (BTU).

Massachusetts[3]

i) Liquefied natural gas (LNG) is a major generation source in the State, with natural gas fueling approximately 2/3 of in-state electricity net generation in 2020.

ii) In 2020, solar represented 19% of in-state electricity net generation.

iii) More than 50% of households use natural gas as their primary heating source, with another 25% using fuel oil.

iv) 2020 net generation – 18,214,141 MWh

- Electric utilities – 487,991 MWh
- IPP and CHP – 17,726,150 MWh

v) In January 2022, net electricity generation by source was as follows:

- Petroleum-fired – 443,000 MWh

[3] *Massachusetts Profile* (2022). Available at: https://www.eia.gov/state/print.php?sid=MA

- Natural Gas-fired – 1,449,000 MWh
- Hydroelectric – 71,000 MWh
- Non-hydroelectric renewables – 226,000 MWh

vi) Massachusetts consumes almost three times the electricity it generates in-state and more than fifteen times the energy it produces.

vii) Massachusetts is a major importer of out-of-state and internationally sourced natural gas, which is delivered via interstate pipelines and/or import terminals. The LNG terminal in Everett received 60% of the United States' total LNG imports in 2020.

Vermont[4]

i) In 2020, almost 100% of Vermont's electricity generated in-state was derived from renewables (hydroelectric and non-hydroelectric).

ii) Vermont's primary energy source is hydroelectricity which accounts for approximately 58% of utility-scale in-state generation. Five utility-scale wind farms account for approximately 15% of total electricity net generation.

iii) Approximately 60% of households use petroleum as their primary heating source and another 13% use wood as their primary heating source.

iv) Net generation – 2,156,407 MWh

- Electric utilities – 899,954 MWh
- IPP and CHP – 1,256,454 MWh

v) In January 2022, net electricity generation by source was as follows:

- Hydroelectric – 92,000 MWh
- Non-hydroelectric renewables – 100,000 MWh

vi) Vermont consumes more than three times the energy it generates in-state.

[4] *Vermont Profile* (2022). Available at: https://www.eia.gov/state/print.php?sid=VT

vii) More than 50% of the electricity supply is from out-of-state with the largest share thereof in the form of imported Canadian hydroelectric power.

viii) Net electricity import consumption: 48.2 trillion BTU.

(d) Vermont – Energy Efficiency Utility (EEU) funding in Vermont is not fully funded by ratepayers. According to the State of Vermont's Public Utility Commission, EEU funding is comprised of the following three primary sources[5]:

i) The Energy Efficiency Charge (EEC);

ii) Revenues from Vermont's participation in the ISO New England Forward Capacity Market; and

iii) Revenues from Vermont's participation in the cap-and-trade Regional Greenhouse Gas Initiative (RGGI).

Electric and natural gas ratepayers fund a portion of EEU programming via the EEC. Additional EEU funding is sourced from the State's participation in the Forward Capacity Market and cap-and-trade RGGI.

Massachusetts – efficiency programming in Massachusetts is not fully funded by ratepayers. The Department of Public Utilities (DPU) issued an Order on February 2, 2022, approving the 2022-2024 Three-Year Energy Efficiency Plan of the Massachusetts' electric and gas distribution companies and the Cape Light Compact[6]. The Order is included as Attachment 3 of this IR response, namely DPU 21-120 through 21-129.

[5] *EEU Budgets, Performance Goals, and Annual Plans | Public Utility Commission* (2022). Available at: https://puc.vermont.gov/energy-efficiency-utility-program/eeu-budgets-performance-goals-and-annual-plans (Accessed: 22 April 2022).

[6] Department of Public Utilities, 2022. *DPU Approves Massachusetts' Nation-Leading Three Year Energy Efficiency Plan*. Available at: https://www.mass.gov/news/dpu-approves-massachusetts-nation-leading-three-year-energy-efficiency-plan (Accessed 22 April 2022).

Massachusetts' utilities derive funding for energy efficiency programming from several sources, including ratepayers. Per footnote 18 in Attachment 3 of this IR response, the following funding sources were identified:

i) Ratepayers/utility customers via the legislated $0.0025 per kWh System Benefits Charge first established in 1997;
ii) Revenues from the ISO New England Forward Capacity Market;
iii) Revenues from applicable cap-and-trade programs such as RGGI; and
iv) Other sources, which may include additional ratepayer funding through fully reconciling mechanisms (if approved).

Program Administrator first recover costs for their 2022-2024 Plan from other revenue sources but have the ability to seek additional funding from ratepayers through a fully reconciling funding mechanism.

Maine – efficiency programming in Maine is not fully funded by ratepayers. As stated in its FY2021 Annual Report[7], the Efficiency Maine Trust's funding sources include:

i) Ratepayers (both electricity and natural gas customers alike);
ii) Revenue from the cap-and-trade RGGI;
iii) The Maine Power Reliability Program (MPRP) Settlement;
iv) Revenue from the ISO New England Forward Capacity Market
v) Volkswagen Settlements; and
vi) The New England Clean Energy Connect (NECEC) Settlement.

(e) Please see Appendix D of Attachment 1 of this IR reponse, namely State Energy Efficiency Resource Standards, which provides an overview of the legislative/regulatory standards

[7] *FY 2021 Annual Report* (2022). Efficiencymaine.com. Available at: https://www.efficiencymaine.com/docs/FY21-Annual-Report_1.21.2021_final.pdf

that are applicable for each of Maine, Massachusetts and Vermont. Information provided in Appendix D includes but is not limited to:

i) Authority type (Legislative or Regulatory), primary source references, and year of enactment:

a. Maine – Legislative, 2009:

1. Efficiency Maine Triennial Plan (2014–16)
2. Efficiency Maine Triennial Plan (2017–19)
3. Efficiency Maine Triennial Plan (2020–22)
4. HP 1128 – LD 1559

b. Massachusetts – Legislative, 2009:

1. M.G.L. ch. 25, § 21
2. D.P.U. 18-110 through D.P.U. 18- 119 (MA Joint Statewide Three- Year Energy Efficiency Plan for 2019 through 2021)

c. Vermont – Legislative, 2000:

1. 30 V.S.A. § 209
2. Efficiency Vermont Triennial Plan 2018–20
3. Order Re: Quantifiable Performance Indicator Targets for Vermont Gas Systems (12/23/15)
4. EEU-2016-03: PUC Order on 10/12/17 re: Performance Targets

ii) Program applicability as a percentage of sales affected statewide and Mandate:

a. Maine – Efficiency Maine (amounting to 100% applicability), with an all-cost-effective mandate.

b. Massachusetts – includes Investor-owned Utilities (IOUs), Co-operatives, Municipal Utilities, Cape Light Compact (amounting to 85% applicability), with an all-cost-effective efficiency requirement.

c. Vermont – Efficiency Vermont, Burlington Electric (amounting to 98% applicability), with an all-cost-effective energy efficiency requirement.

iii) The corresponding strictness of the standard (Binding, Opt-out, Cost-cap):

a. Maine: Opt-out

b. Massachusetts: Binding

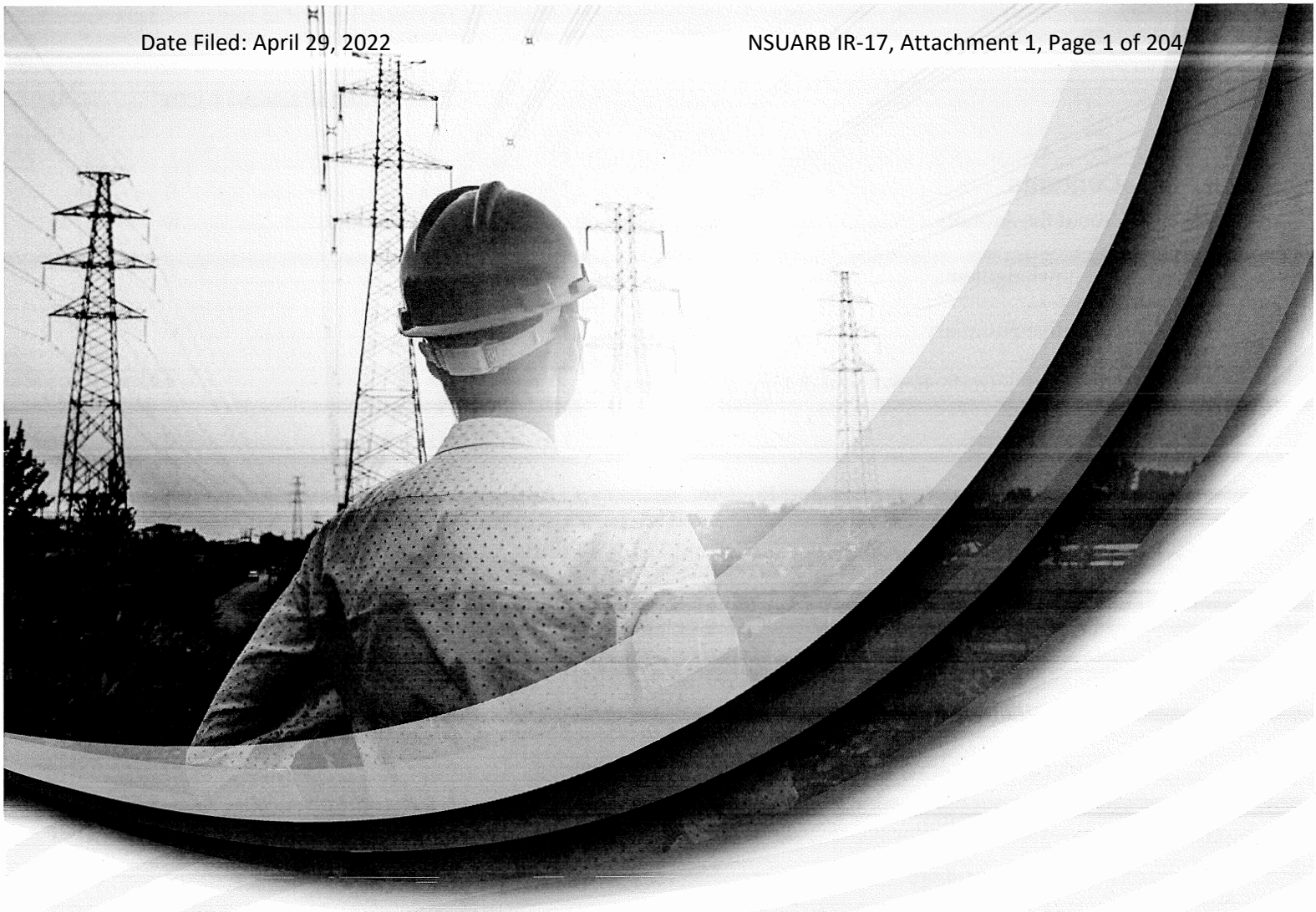
c. Vermont: Binding

iv) Average incremental electric savings target as a percent of retail sales per year (2020–2025):

a. Maine: 1.25% (Gross), 1.0% (Net)

b. Massachusetts: 2.7%

c. Vermont: 2.4%



THE 2020 STATE ENERGY EFFICIENCY SCORECARD

Weston Berg, Shruti Vaidyanathan, Ben Jennings, Emma Cooper, Chris Perry, Marianne DiMascio, and Jack Singletary

RESEARCH REPORT
DECEMBER 2020

ACEEE
American Council for an Energy-Efficient Economy

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Acknowledgments

This report was made possible through the generous support of the Tilia Fund and The JPB Foundation. The authors gratefully acknowledge external reviewers, internal reviewers, colleagues, and sponsors who supported this effort. First and foremost, we thank our many contacts at state energy offices and public utility commissions, too numerous to list here, who provided valuable utility data and information on energy efficiency policies and programs and offered feedback on a draft of this report.

We also thank the peer reviewers from national and regional organizations who have greatly enhanced the *State Scorecard*. These external expert reviewers include, in no particular order, Howard Geller, Tammy Fiebelkorn, Matt Frommer, Kevin Emerson, Travis Madsen, Justin Brant, and Jim Meyers (Southwest Energy Efficiency Project); Emmeline Luck (Southeast Energy Efficiency Alliance); Amy Boyd (Acadia Center); Juliana Williams (National Renewable Energy Laboratory); Chris Herbert and Michael Choate (South-Central Partnership for Energy Efficiency as a Resource); Samantha Caputo and Darren Port (Northeast Energy Efficiency Partnerships); Lara Ettenson, Mohit Chhabra, and Kathy Harris (Natural Resources Defense Council); Jennifer Gunby (U.S. Green Building Council); Stacey Paradis, Nick Dreher, Maddie Wazowicz, Gregory Ehrendreich, Reine Rambert, and Samarth Meddakar (Midwest Energy Efficiency Alliance); Greg Wikler and Serj Berelson (California Efficiency + Demand Management Council); and Montelle Clark (Oklahoma Sustainability Network).

We thank our internal reviewers: Steve Nadel, Maggie Molina, Rachel Gold, Bryan Howard, and Naomi Baum. We also gratefully acknowledge the help of the experts who participated in working groups, including Eric Lacey (Responsible Energy Codes Alliance), Ed Carley (National Association of State Energy Officials), Jim Edelson and Kevin Carbonnier (New Buildings Institute), and Joanna Mauer and Andrew deLaski (Appliance Standards Awareness Project).

Last, we would like to thank Fred Grossberg, Mariel Wolfson, and Mary Robert Carter for developmental editing and managing the editorial process; Elise Marton, Kristin Cleveland, Sean O'Brien, and Roxanna Usher for copy editing; Kate Doughty for assistance with publication and graphic design; and Wendy Koch, Ben Somberg, Maxine Chikumbo, and the Hastings Group for their help in launching this report.

Suggested Citation

Berg, W., S. Vaidyanathan, B. Jennings, E. Cooper, C. Perry, M. DiMascio, and J. Singletary. 2020. *The 2020 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u2011.

Executive Summary

KEY FINDINGS

This report ranks U.S. states on their policy and program efforts to save energy and pursue efficiency as a cost-effective, critical tool for slashing emissions and meeting state clean energy goals.

In a year dramatically impacted by a global pandemic and associated recession, efforts to advance clean energy goals struggled to maintain momentum amid the loss of 400,000 energy efficiency jobs by the summer and disruptions to countless lives. Despite these challenges, some states continued to successfully prioritize energy efficiency as an important resource to help reduce household and business energy bills, create jobs, and reduce emissions.

First place goes to California, which sets the pace in saving energy on multiple fronts with adoption of net-zero energy building codes, stringent vehicle emissions standards, and industry-leading appliance standards. Growing efforts to decarbonize the state's building sector are a cornerstone of its pursuit of a 100% clean energy future. California continues to serve as a leader and standard-setter for the country in fighting climate change. More than a dozen states have adopted California's low-emissions vehicle regulations, and nine states have adopted its zero-emission vehicle program.

Rounding out the top 10 are Massachusetts at #2, followed by Vermont (#3), Rhode Island (#4), New York (#5), Maryland (#6), Connecticut (#7), the District of Columbia (#8), and a tie between Minnesota, and Oregon (#9).

Regional leaders included Massachusetts (#2) in the Northeast, Minnesota (#9) in the Midwest, California (#1) in the West, Colorado (#11) in the Southwest, and Virginia (#25) in the South.

This year's most improved state was Nevada. Last year the governor also signed AB54, adopting federal standards into state law in order to protect against federal efforts to roll back energy-saving light bulb standards. Additionally, the state has adopted the 2018 International Energy Conservation Code (IECC) for residential and commercial buildings, and in June Nevada's environmental agency announced plans to adopt California's vehicle emission standards and Zero-Emission Vehicle (ZEV) mandate.

Other states to watch include Virginia and New Jersey. They are the most recent additions to the list of now 27 states that have adopted a utility-sector energy efficiency resource standard. Stakeholders in both states continue to select and design programs to scale up efficiency offerings to meet the new standards.

Iowa fell the farthest in the rankings, an outcome of 2018 legislation that capped demand-side investment at a low level and enabled customers to opt out of paying for programs, leading to a steep decline in electric and gas savings in 2019.

Savings from ratepayer-funded electric efficiency programs remained fairly level compared with last year's results, totaling approximately 26.9 million megawatt-hours. These savings are equivalent to about 0.70% of total retail electricity sales in the United States in 2019, enough to power almost 2.6 million homes for a year.

Buildings efficiency advocates celebrated the release of the 2021 International Energy Conservation Code (IECC), the most significant advancement in model code efficiency in almost a decade. The code represents a major victory for a broad coalition of stakeholders and International Code Council voting members, including cities and states. The resulting 10% estimated improvement in efficiency will offer U.S. states and cities a great opportunity to save money and reduce GHG emissions from buildings.

The *State Energy Efficiency Scorecard*, now in its 14th edition, ranks states on their policy and program efforts over the past year.[1] It assesses performance, documents best practices, and recognizes leading efficiency strategies deployed in the service of state climate goals. These efficiency policies offer a vital strategy for states to reduce their greenhouse gas (GHG) footprints in a massive way. ACEEE analyses have determined that the United States can slash its projected energy use approximately 50% by 2050 through a suite of energy efficiency measures including zero-energy homes, building retrofits, industrial energy efficiency, and vehicle fuel economy.[2]

Figure ES1 shows the states' rankings, divided into five tiers for ease of comparison. Later in this section, table ES1 provides details of each state's scores.

[1] The report considers programs and policies adopted as of July 2020. However, scores for some performance-based categories, such as those in Chapter 2 (utility programs), were determined by the latest available data from 2019 program years.

[2] S. Nadel. *Pathway to Cutting Energy Use and Carbon Emissions in Half.* Washington, DC: ACEEE, 2016); S. Nadel, and L. Unger. *Halfway There: Energy Efficiency Can Cut Energy Use and Greenhouse Gas Emissions in Half by 2050.* (Washington, DC: ACEEE, 2019).

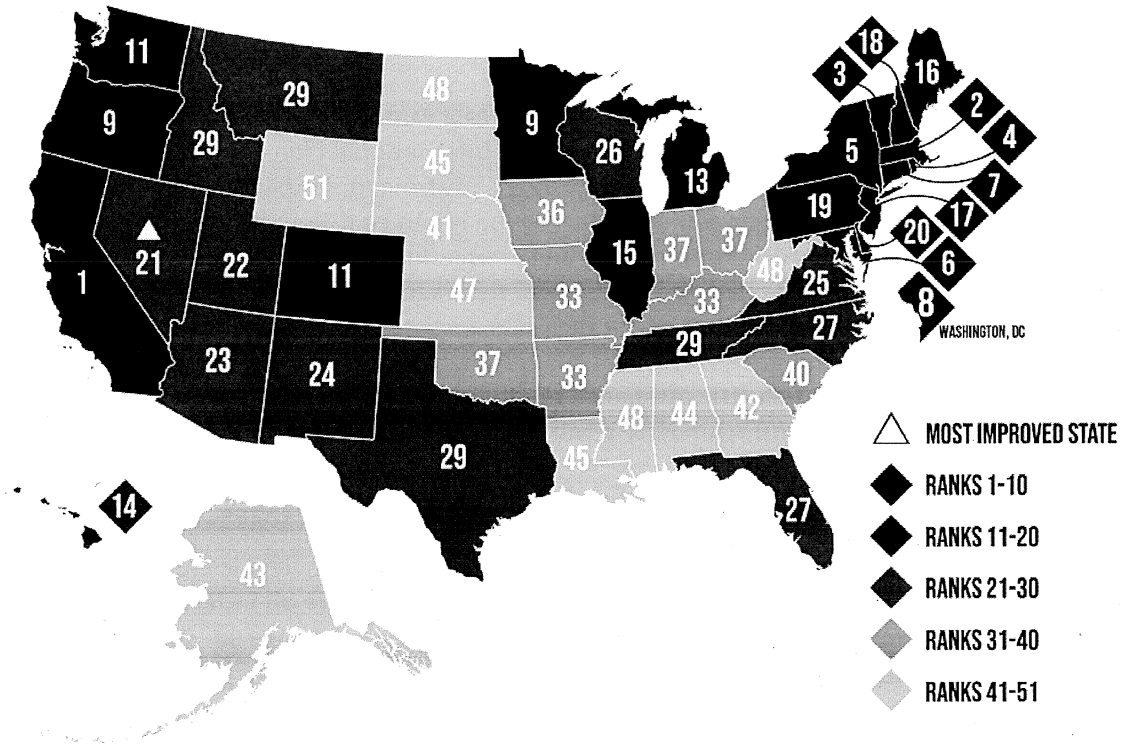

Figure ES1. *2020 State Scorecard* rankings

Following a vibrant 2019 that saw numerous states and utilities adopt ambitious climate goals, clean energy struggled somewhat to maintain a place on the policy agenda in 2020. Governments at all levels had to abruptly shift their focus to mitigate the health and economic impacts of a deadly global pandemic, and by the summer of 2020, COVID-19 had forced more than 600,000 in the clean energy sector out of work, with energy efficiency contractors among those hit hardest, representing about 70% of the total.[3] As states and legislators scrambled to redirect resources and contain both a health and an economic crisis, momentum slowed on many efforts to advance energy-saving policies.

Yet in spite of these challenges, several states celebrated some very promising policy achievements this year, laying the foundations to greatly scale up efficiency programs and slash emissions. These states included Virginia and New Jersey, which have joined 25 other states that have adopted a robust energy efficiency resource standard for their utility power sectors. Major efficiency and climate bills were also in play in Illinois, Maryland, Colorado, and Minnesota; while these stalled amid the pandemic, they are likely to remain on the table

[3] Jordan, P. 2020. *Memorandum: Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis, April 2020*. Wrentham, MA: BW Research Partnership. e2.org/wp-content/uploads/2020/05/Clean-Energy-Jobs-April-COVID-19-Memo-FINAL.pdf.

as advocates and stakeholders continue to champion efficiency's role in meeting carbon goals.

It is also important to recognize that 2020 was a momentous year for buildings sector efficiency, following the release of the 2021 International Conservation Energy Code (IECC). The new codes, which require at least a 10% improvement in efficiency beyond the previous codes, were also a major achievement for the broad coalition of organizations and stakeholders that worked more than a year on education and outreach. These efforts helped spur state and local governments to make their voices heard by voting on and adopting the new codes. The 2021 IECC notably includes a new optional appendix enabling zero-energy performance. Local governments also overwhelmingly voted to include provisions for electric vehicle and electric appliance readiness as well as increased water heater efficiency, though these were unfortunately removed by the ICC Board of Directors upon appeal.

In addition, a growing number of states are embracing California's low- and zero-emission vehicle rules in an effort to maintain momentum on vehicle efficiency at a time when current federal leadership has sought to roll back national vehicle emissions standards. Since late 2019, Minnesota, New Mexico, and Nevada have all indicated plans to adopt these rules—joining more than a dozen others that have already done so—in a growing coalition of states committed to reducing transportation-driven emissions.

State-driven appliance standards also remained extremely important against the backdrop of federal rollback efforts. By establishing minimum efficiency thresholds for common home and office products like lighting, electronic devices, and plumbing fixtures, these state standards have been critical to helping consumers save on utility bills and spurring adoption of stronger national standards. Since our last report, California, New York, and Oregon have each advanced new standards, and Massachusetts, New Jersey, and DC have filed proposed bills still under consideration.

POLICY AREAS

The *Scorecard* compares states across five policy areas:[4]

- Utility and public benefits programs and policies
- Transportation policies
- Building energy efficiency policies
- State government–led initiatives around energy efficiency
- Appliance and equipment standards

Table ES1 provides examples of states that have adopted best-practice policies in each area. For more information about leading states, refer to the *Scorecard* chapter corresponding to the relevant policy area.

[4] The 2020 *State Scorecard* removes our discussion of combined heat and power (CHP) policies. We continue to count savings from CHP in our utility program scoring metrics (Chapter 2).

Table ES1. States adopting best-practice policies

Area	States	Achievements
Utility and public benefits	Rhode Island, Massachusetts, Maryland, Vermont	All have adopted robust energy efficiency resource standards and continue to post electric utility savings above 2% of retail sales, the highest levels in the nation.
Transportation	California, District of Columbia, Massachusetts, Maryland, Oregon, Vermont, Washington	Each of these jurisdictions has adopted California's vehicle emissions standards as well as its Zero-Emission Vehicle (ZEV) program, and each has adopted goals to reduce vehicle miles traveled or transportation-related GHGs.
Building energy efficiency	California, Delaware, Illinois, Oregon, Maryland, Massachusetts, Nebraska, Nevada, New Jersey, New Mexico, New York, Oregon, Washington, Vermont	These states have strengthened efficiency standards for new construction by adopting building energy codes aligned with the 2018 IECC, ASHRAE 90.1-2016, or stronger, in addition to devoting resources to maintaining code compliance.
State government initiatives	California, Connecticut, Delaware, Massachusetts, Rhode Island, Vermont	These states led this year in offering loan and grant programs to spur energy savings, setting efficiency standards for public buildings and fleets, and investing proceeds from carbon pricing policies in efficiency programs.
Appliance/equipment standards	California, Colorado, Nevada, Washington, Vermont, Hawaii, New York	Each of these states passed appliance standards since 2019 that are expected to save consumers hundreds of millions of dollars on utility bills.

SCORES

Table ES2 presents state scores in the five policy areas and their total scores.

Table ES2. State scores in the *2020 State Scorecard*

Rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2019	Change in score from 2019
1	California	16	10.5	7.5	6	3	43	1	-0.5
2	Massachusetts	19.5	10	7	6	0	42.5	-1	-2
3	Vermont	17.5	8.5	6	6	2	40	0	-0.5
4	Rhode Island	19.5	8	6	6	0	39.5	-1	-1
5	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	-0.5
6	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
7	Connecticut	12.5	8.5	6.5	6	0	33.5	-1	-3
8	District of Columbia	9.5	11	8.5	4	0	33	3	4
9	Minnesota	13	7	6.5	5.5	0	32	-1	-0.5
9	Oregon	11	8.5	7	5.5	0	32	0	0
11	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
11	Washington	7.5	8.5	7.5	5	2	30.5	-1	-1
13	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
14	Hawaii	11	6	7	2.5	1.5	28	2	2.5
15	Illinois	12	5	6	4	0	27	-4	-2
16	Maine	9	7.5	4.5	5.5	0	26.5	-1	0.5
17	New Jersey	8.5	7	6.5	3	0	25	0	1
18	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
19	Pennsylvania	4	6.5	6.5	5	0	22	-1	-1.5
20	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
21	Nevada	5	4	6.5	4.5	1	21	5	5.5
22	Utah	6.5	4.5	6	3.5	0	20.5	0	1
23	Arizona	8.5	5	4.5	2	0	20	-4	-1.5
24	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
25	Virginia	1.5	6	5.5	5	0	18	4	3
26	Wisconsin	7.5	2.5	3	4	0	17	-1	1
27	Florida	1.5	5	6	4	0	16.5	-3	0
27	North Carolina	3	4.5	5	4	0	16.5	-1	1
29	Idaho	6	1	5.5	2	0	14.5	1	0
29	Montana	3.5	2.5	5.5	3	0	14.5	7	2
29	Tennessee	1	5	3.5	5	0	14.5	1	0
29	Texas	1	3.5	6.5	3.5	0	14.5	-3	-1
33	Arkansas	7	0	3	3.5	0	13.5	0	-0.5
33	Kentucky	1.5	3	5	4	0	13.5	5	2.5
33	Missouri	2.5	3	4	4	0	13.5	-3	-1
36	Iowa	4	3.5	4	1	0	12.5	-13	-6
37	Indiana	4	3	3	1.5	0	11.5	3	1
37	Ohio	4	0.5	3.5	3.5	0	11.5	-4	-2.5
37	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	-0.5
40	South Carolina	2	2.5	2.5	4	0	11	0	0.5
41	Nebraska	0.5	2	6	2	0	10.5	2	1
42	Georgia	2	1.5	4.5	2	0	10	-4	-1
43	Alaska	1	3.5	1.5	3.5	0	9.5	-3	-1
44	Alabama	0	0.5	5.5	3	0	9	-1	-0.5
45	Louisiana	0.5	3	2	2.5	0	8	3	1.5
45	South Dakota	2	2	3.5	0.5	0	8	1	1
47	Kansas	0.5	2	3.5	1	0	7	-1	0
48	Mississippi	2	0.5	0.5	2.5	0	5.5	-3	-2.5
48	North Dakota	0	2	3	0.5	0	5.5	2	0.5
48	West Virginia	-1	1	4	1.5	0	5.5	0	-1
51	Wyoming	1	0.5	0	2.5	0	4	0	-0.5

REGIONAL HIGHLIGHTS

For the first time, the *2020 State Scorecard* ranks states not only nationally but also regionally, making it possible to compare states that have shared geographies and similar climatic conditions. States can assess how their progress on energy efficiency compares to that of their neighbors. Table ES3 shows the state rankings broken down by region.

Table ES3. Regional rankings in the *2020 State Scorecard*

Regional rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in national rank from 2019	Change in score from 2019
				Midwest					
1	Minnesota	13	7	6.5	5.5	0	32	-1	-0.5
2	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
3	Illinois	12	5	6	4	0	27	-4	-2
4	Wisconsin	7.5	2.5	3	4	0	17	-1	1
5	Missouri	2.5	3	4	4	0	13.5	-3	-1
6	Iowa	4	3.5	4	1	0	12.5	-13	-6
7	Indiana	4	3	3	1.5	0	11.5	3	1
7	Ohio	4	0.5	3.5	3.5	0	11.5	-4	-2.5
9	Nebraska	0.5	2	6	2	0	10.5	2	1
10	South Dakota	2	2	3.5	0.5	0	8	1	1
11	Kansas	0.5	2	3.5	1	0	7	-1	0
12	North Dakota	0	2	3	0.5	0	5.5	2	0.5
				Northeast					
1	Massachusetts	19.5	10	7	6	0	42.5	-1	-2
2	Vermont	17.5	8.5	6	6	2	40	0	-0.5
3	Rhode Island	19.5	8	6	6	0	39.5	-1	-1
4	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	-0.5
5	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
6	Connecticut	12.5	8.5	6.5	6	0	33.5	-1	-3
7	District of Columbia	9.5	11	8.5	4	0	33	3	4
8	Maine	9	7.5	4.5	5.5	0	26.5	-1	0.5
9	New Jersey	8.5	7	6.5	3	0	25	0	1
10	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
11	Pennsylvania	4	6.5	6.5	5	0	22	-1	-1.5
12	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
				South					
1	Virginia	1.5	6	5.5	5	0	18	4	3
2	Florida	1.5	5	6	4	0	16.5	-3	0
2	North Carolina	3	4.5	5	4	0	16.5	-1	1
4	Tennessee	1	5	3.5	5	0	14.5	1	0
4	Texas	1	3.5	6.5	3.5	0	14.5	-3	-1
6	Arkansas	7	0	3	3.5	0	13.5	0	-0.5
6	Kentucky	1.5	3	5	4	0	13.5	5	2.5
8	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	-0.5
9	South Carolina	2	2.5	2.5	4	0	11	0	0.5
10	Georgia	2	1.5	4.5	2	0	10	-4	-1
11	Alabama	0	0.5	5.5	3	0	9	-1	-0.5
12	Louisiana	0.5	3	2	2.5	0	8	3	1.5
13	West Virginia	-1	1	4	1.5	0	5.5	0	-1
13	Mississippi	2	0.5	0.5	2.5	0	5.5	-3	-2.5
				Southwest					
1	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
2	Nevada	5	4	6.5	4.5	1	21	5	5.5

Regional rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in national rank from 2019	Change in score from 2019
3	Utah	6.5	4.5	6	3.5	0	20.5	0	1
4	Arizona	8.5	5	4.5	2	0	20	-4	-1.5
5	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
6	Wyoming	1	0.5	0	2.5	0	4	0	-0.5
				West					
1	California	16	10.5	7.5	6	3	43	1	-0.5
2	Oregon	11	8.5	7	5.5	0	32	0	0
3	Washington	7.5	8.5	7.5	5	2	30.5	-1	-1
4	Hawaii	11	6	7	2.5	1.5	28	2	2.5
5	Idaho	6	1	5.5	2	0	14.5	1	0
5	Montana	3.5	2.5	5.5	3	0	14.5	7	2
7	Alaska	1	3.5	1.5	3.5	0	9.5	-3	-1

This year's regional leaders are Minnesota (Midwest), Massachusetts (Northeast), Virginia (South), Colorado (Southwest), and California (West). In addition to these leaders, we have identified each region's "state to watch," where many promising new policy developments are emerging.

MIDWEST

Leading state: Minnesota ranked first in the region, driven by strong energy savings goals established under the state's 2007 Next Generation Energy Act. Minnesota continues to explore opportunities to advance efficiency in ways that promote building electrification and encourage adoption of electric vehicles. For example, in 2019, Governor Tim Walz called for the creation of Minnesota's Clean Car program, which would adopt California's tailpipe and ZEV standards; plans are ongoing to complete the approval process by the end of 2020.

State to watch: In Michigan, recently approved utility integrated resource plans have set Consumers Energy and DTE Energy, the state's two largest utilities, on paths to achieve savings even higher than those set in the state's statutory goals. With the recent creation of the Michigan Office of Future Mobility and the Council on Mobility and Electrification, the state is setting the stage to further vehicle electrification and sustainable transportation policies. In October 2019, the governor and the state's Public Service Commission launched a multiyear stakeholder initiative and proceeding called MI Power Grid, which will work on new technologies, pilots, and utility business models in order to optimize the transition to a clean energy grid.

NORTHEAST

Leading state: Driven by the strength of a robust policy framework under the state's 2008 Green Communities Act, Massachusetts continues to deliver nation-leading levels of utility savings alongside strong building energy codes that include provisions for solar readiness. In recent years the state has taken major steps to better align energy efficiency with its climate goals. These steps include incentives for homeowners who switch from oil and propane furnaces to electric heat pumps, measures to reduce winter and summer peak

demand, and the creation of a Clean Peak Standard, which gives credits for clean energy delivered during hours of peak demand.

State to watch: New Jersey marked a critical milestone in its efforts to scale up energy efficiency and deliver on robust energy savings goals established under its 2018 Clean Energy Act. The state's Board of Public Utilities issued an order establishing a framework of programs, including five-year targets that ramp up electric and gas savings to some of the highest levels in the nation. This order also seeks to ensure that low-income customers have equitable access to energy efficiency programs by calling for specific provisions and enhanced incentives that serve their communities. These programs, planned for June of 2021, will work in parallel with Governor Phil Murphy's recently released economy-wide Energy Master Plan (EMP), which lays out a pathway to 100% clean energy by 2050.

SOUTH

Leading state: Virginia was among the top energy stories of 2020, creating its first-ever clean energy standard and becoming the first state in the Southeast with a 100% clean electricity goal. The Virginia Clean Economy Act also established an energy efficiency resource standard that sets multiyear electric savings targets for utilities and includes important measures to support low-income customers and reduce energy burdens. The governor also signed HB 981, making Virginia the first southern state to join RGGI, with proceeds going toward energy efficiency, renewable energy, and climate mitigation measures.

State to watch: Although North Carolina ranks about midway down the *Scorecard* (tied for 27th), its utilities report some of the highest levels of electric savings in the Southeast. The state is also exploring new opportunities to strengthen both its energy efficiency programs and its adoption of electric vehicles. In 2019, in partnership with the Nicholas Institute at Duke University, the state released the North Carolina Energy Efficiency Roadmap to help achieve its energy savings potential and the goals of its Clean Energy Plan.

Southwest

Leading state: Utility savings continue to climb higher in Colorado in response to the strong efficiency goals set by Xcel Energy, the state's largest utility. State policymakers have been busy advancing plans that will address statewide climate goals signed last year, which target a 90% reduction in GHGs by 2050 (HB19-1261). These efforts have included new appliance and water efficiency standards, measures to strengthen local building energy codes, and plans to scale up utility investments to promote in EV infrastructure and adoption. In September, Governor Jared Polis released a draft GHG Pollution Reduction Roadmap with near-term actions to meet the state's 2030 and 2050 climate goals.

State to watch: Arizona and its utilities have been regional leaders in energy efficiency, delivering among the strongest levels of savings in the Southwest. However, the state is at an important turning point with its utility efficiency programs: in November 2020, the Arizona Corporation Commission decided to extend and expand the state's current energy efficiency resource standard (EERS) and set a 100% carbon-free electricity standard. The final vote to adopt these new rules is expected in 2021.

WEST

Leading state: California's enduring leadership on building energy codes, vehicle emissions, and appliance standards continues to set the pace in advancing energy efficiency on a variety of fronts at the national level and among other states who model their own policies after California's example. More than a dozen states have adopted California's low-emissions vehicle regulations, and 11 other states have adopted its zero-emissions vehicle program. A September Executive Order signed by Governor Gavin Newsom called for phasing out the sale of gasoline-powered vehicles by 2035, the most ambitious clean-car policy in the United States. In addition, the state's energy code is one of the most aggressive in the country and has been a powerful vehicle for advancing energy efficiency standards for building equipment.

State to watch: Washington made headlines in 2019 by passing an ambitious slate of climate legislation, including a law requiring that 100% of the state's electricity come from clean energy sources by 2045. Electric utilities have set biennial savings targets for the past 10 years, and in 2019 the state passed legislation (HB 1257)—expected to take effect in 2022—to also develop natural gas savings targets. The state legislature passed HB 1257 in 2019, the first statewide adoption of an energy performance standard for large commercial buildings (set to take effect in 2021). In 2019 lawmakers passed HB 1444, a comprehensive set of energy and water efficiency standards, including federal appliance and light bulb standards to protect against rollbacks.

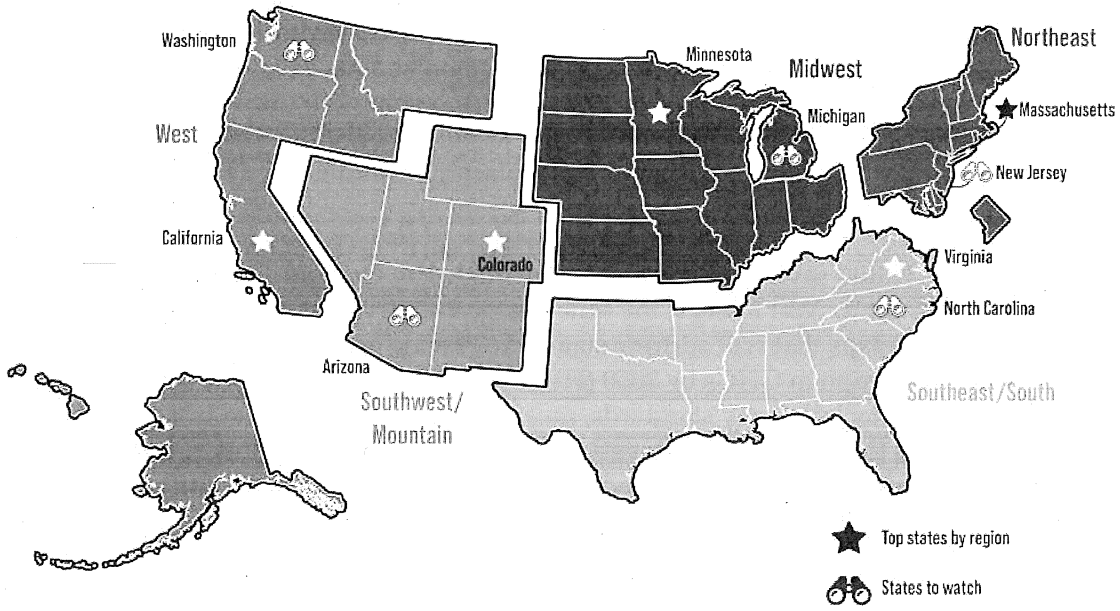

Figure ES2. *2020 State Scorecard* regional rankings

LOOKING AHEAD: EQUITY IN STATE AND UTILITY PLANNING AND PROGRAMS

An integral area of focus for ACEEE is the advancement of social equity principles in clean energy and efficiency planning, policy, and program design. Historically, energy efficiency initiatives have typically failed to adequately serve and represent marginalized groups,

particularly neighborhoods whose residents are predominantly Black, Indigenous, and/or people of color, as well as low-income customers, immigrants, and people with disabilities. These individuals often face disproportionately high energy burdens, meaning they spend a larger percentage of their income on energy bills than do their counterparts.[5] Furthermore, their underrepresentation within clean energy policymaking and planning means that many of the benefits of these policies do not equitably reach all communities.

While the *State Scorecard*'s current scoring methodology considers multiple state policies to address low-income household access to and participation in energy efficiency programs, ACEEE is committed to highlighting and encouraging broader efforts to embed equity in clean energy policymaking. This year we continue to award a point for supportive low-income utility efforts in Chapter 2 (utility policies) and a half-point for policies to address equitable access to public transportation in Chapter 3 (Transportation). Still, states can do much more to ensure that policy and program outcomes are equitable. These efforts are perhaps more important now than ever as states and local communities wrestle with the impact of the COVID-19 pandemic, which has been especially devastating for communities of color. The benefits of energy efficiency, including job creation, reduced energy bills, and healthy homes, will be critical to a successful economic recovery.

In addition to increasing investments in and access to clean energy in historically underinvested low-income communities and communities of color, emerging state efforts are underway also to address equity in community engagement, decision making, and workforce development initiatives. Examples include conducting state-level needs assessments and barrier analyses and establishing internal protocols and metrics to evaluate the equity of policy outcomes. Policymakers and stakeholders can also work to address gaps in worker skills and offer trainings, job placement, and job access strategies to help bring marginalized groups into the clean energy workforce.[6]

To gather information on state efforts to better address the needs of historically overlooked customers, this year's *Scorecard* data collection effort included new questions related to equity in energy planning, decision making, and clean energy job training. While we have yet to formally integrate these data and principles within our scoring framework, we have included this information in a new section in ACEEE's State and Local Policy Database titled "Equity Metrics and Workforce Development."[7] We hope this information can serve as an important resource for policymakers, utilities, and clean energy and community advocates seeking to identify leading examples and help equitably extend the benefits of energy efficiency to all households.

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[5] A. Drehobl, L. Ross, and R. Ayala. 2020. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burdens across the U.S.* (Washington, DC: ACEEE, 2020).

[6] M. Shoemaker and D. Ribeiro. 2018. *Through the Local Government Lens: Developing the Energy Efficiency Workforce.* (Washington, DC: ACEEE, 2018); M., Shoemaker, R. Ayala, and D. York. 2020. *Expanding Opportunity through Energy Efficiency Jobs: Strategies to Ensure a More Resilient, Diverse Workforce.* (Washington, DC: ACEEE, 2020).

[7] See database.aceee.org/state/equity-workforce.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

A variety of policy tools and program designs are available to state officials to scale up energy savings across multiple use sectors, in turn delivering immense carbon savings to help meet U.S. climate goals. These programs also provide an important opportunity to support economic recovery from COVID-19 by helping to reduce home and business energy bills, generate employment, and lessen the need for imported energy fuels. The following list highlights examples of best practices by state policymakers seeking to improve energy efficiency performance by energy utilities, in the buildings and transportation sectors, and through appliance standards. We also highlight best practices that reduce legal and market barriers to investing in energy efficiency and expand participation in programs that achieve savings.

Establish and adequately fund an energy efficiency resource standard (EERS) or similar energy savings target. EERS policies set specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs. They serve as an enabling framework for cost-effective investment, savings, and program activity. As states address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places like Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification and GHG reduction objectives.

Examples: Arkansas, Colorado, Massachusetts, Michigan, Minnesota, New Jersey, New York, Virginia

Adopt California tailpipe emissions standards and set quantitative targets for reducing vehicle miles traveled (VMT). Transportation consumes almost 30% of the total energy used in the United States and therefore offers an important opportunity to reduce carbon emissions.[8] At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. A variety of state-level policy options are available to improve transportation system efficiency. These include codifying targets for reducing VMT and integrating land use and transportation planning to create communities where people have access to multiple modes of travel and need not rely on owning personal vehicles. While federal fuel economy standards are expected to go a long way toward reducing fuel consumption, standards for model years 2022–2025 face an uncertain future following the April 2020 release of federal rollbacks. States that adopt California's tailpipe emissions standards will lead the way by pushing manufacturers to offer a greater variety of low- and zero-emission vehicles and accelerate the transition to EVs.

Examples: California, Colorado, Massachusetts, New York, Oregon

Ensure energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all customers, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in

[8] EPA. "Sources of Greenhouse Gas Emissions," accessed May 2020. epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

clean energy planning and policymaking. States can foster equity in key decision-making processes by ensuring these efforts are inclusive and designed with all communities in mind. These include establishing internal metrics and frameworks that evaluate the degree to which policy and program outcomes are equitable, developing stakeholder processes and community assessments to better understand the needs of marginalized groups, and adopting inclusive workforce development practices to offer new economic and educational opportunities for groups often underrepresented in the energy efficiency workforce. States can also strengthen incentives and programs for income-qualified customers, and to work with utilities and regulators to recognize and value program nonenergy benefits (NEBs), such as health and economic improvements, as a means of expanding these investments. States and public utility commissions (PUCs) can also include goals specific to the low-income sector, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure investments are targeted toward these customers.

Examples: California, New Jersey, Oregon, Pennsylvania, Tennessee, Washington

Adopt updated, energy-efficient building energy codes, improve code compliance, and involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed in the United States, making them an essential target for cutting energy waste and emissions.[9] Routinely updating and strengthening building energy codes for new construction is one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Additional strategies such as energy performance standards for existing buildings, benchmarking and transparency policies, and financing tools to encourage deep retrofits are also critical for improving efficiency in the existing building stock and reducing building carbon emissions.

Examples: California, Illinois, Maryland, Nebraska, New Mexico, District of Columbia, Washington

Expand state government–led initiatives and make them visible. States can establish sustainable funding sources for energy efficiency incentive programs, invest in energy efficiency–related R&D and demonstration centers, and lead by example by incorporating energy efficiency into government operations. Integrating efficiency into their own operations empowers governments to reduce energy use in public buildings and fleets and to use energy savings performance contracts to finance energy-saving projects. States can also work with utilities and community-based organizations to promote and coordinate energy code compliance training and workforce development programs.

Examples: Alaska, Connecticut, New York

Explore and promote innovative financing mechanisms to leverage private capital and lower the up-front costs of energy efficiency measures. Although utilities in many states offer some form of on-bill financing to promote energy efficiency in homes and buildings, expanding lender and customer participation has been an ongoing challenge. States can pass legislation to increase stakeholder awareness and address legal barriers to the

[9] U.S. Energy Information Administration. "How Much Energy Is Consumed in U.S. Buildings," June 15, 2020. eia.gov/tools/faqs/faq.php?id=86&t=1.

implementation of financing programs. A growing number of states are seeking new ways to maximize the impact of public funds and invigorate energy efficiency by attracting private capital through emerging financing models such as Property Assessed Clean Energy programs and green banks.

Examples: Colorado, Connecticut, Minnesota, Missouri, New York, Rhode Island

Adopt cost-effective efficiency standards for appliances, equipment, lighting, and plumbing products. State appliance standards are a proven policy that lowers utility bills for customers and businesses, reduces pollution, and helps spur national standards. Even when standards are not adopted at the federal level, adoption by just a few states can be enough to impact national markets. The Appliance Standards Awareness Project has recently outlined a menu of new or strengthened standards for 47 products that would reduce annual average household utility bills by more than $100 in 2030 and deliver cumulative utility bill savings of $1.1 trillion through 2050 for consumers and businesses.[10]

Examples: California, Colorado, Washington, Hawaii, Nevada, New York, Vermont

[10] Appliance Standards Awareness Project, *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money* (Boston: ASAP, 2020). appliance-standards.org/sites/default/files/Powerful_Priority_Report.pdf.

Chapter 1. Introduction, Methodology, and Results

Author: Weston Berg

The *State Energy Efficiency Scorecard*, now in its 14th edition, ranks states on their policy and program efforts. It assesses performance, documents best practices, and recognizes leadership. The report captures the latest policy developments and state efforts to save energy and highlights opportunities and policy tools available to governors, state legislators, and regulators.

Although prices for renewable electricity continue to decline, energy efficiency remains our nation's least-cost energy resource while delivering a variety of other benefits such as grid reliability and resilience. States reported utility spending on energy efficiency amounting to roughly $8.4 billion in 2019. Electricity savings levels remained fairly consistent with those reported last year, totaling about 26.9 million megawatt-hours (MWh), enough to power almost 2.6 million homes for a year. Many states and utilities reported efforts to grow and adapt program portfolios to look beyond lighting measures, targeting deep energy home retrofits, smart buildings, expansion of electric vehicle infrastructure, zero-energy buildings, and in some cases electrification of space and water heating.

While 2020 savings were not yet available for this report, future data will undoubtedly show the damaging impact that the COVID-19 pandemic had on programs this year, disrupting progress at all levels of policy and causing significant job losses across the clean energy industry. In the months prior to the first impacts of the pandemic, energy efficiency proved to be a strong job creator, supporting at least 2.4 million jobs across the nation. By the summer, however, the pandemic had caused the loss of 400,000 efficiency jobs and created uncertainty across the industry.

Despite these challenges, states from coast to coast made progress on energy efficiency. As regulators and program administrators worked to redirect resources to those hardest hit, work continued on a number of important clean energy bills and rulemakings, including important efficiency-related policy achievements in New Jersey, Virginia, New York, and Massachusetts. Moreover, as the nation remains mired in a global health crisis and its economic impacts, a number of states are recognizing the important role energy efficiency can play in leading the recovery by helping homeowners and businesses reduce costs, by improving living conditions, and by creating jobs, all while supporting increasingly ambitious state and local goals to reduce carbon emissions. This report seeks to capture and highlight those efforts.

The *Scorecard* is divided into seven chapters. This chapter discusses our scoring methodology (including changes made since last year), presents the overall results of our analysis, and introduces several strategies states can use to improve their energy efficiency. It also spotlights leading states, most-improved states, and policy trends underlying the rankings.

Subsequent chapters present detailed results for five major policy areas. Chapter 2 covers utility and public benefits programs and policies. Chapter 3 discusses transportation policies. Chapter 4 deals with building energy code adoption, state code compliance efforts,

and building policies. Chapter 5 deals with state government initiatives, including financial incentives, lead-by-example policies, and energy efficiency–focused research and development (R&D). Chapter 6 discusses appliance and equipment efficiency standards.

The final chapter summarizes major policy highlights and setbacks occurring since the release of the last *Scorecard* and describes data limitations we encountered in our research. We also describe developing trends in energy efficiency we hope to address with new metrics in future *Scorecards*.

SCORING

States are the testing grounds for policies and regulations. To reflect the enormous diversity of the United States, we chose metrics flexible enough to capture the range of policy and program options that states use to encourage energy efficiency. The policies and programs evaluated in the *State Scorecard* aim to reduce end-use energy consumption, set long-term commitments for energy efficiency, and establish mandatory performance codes and standards. They also help to accelerate the adoption of the most energy-efficient technologies; reduce market, regulatory, and information barriers to energy efficiency; and provide funding for efficiency programs.

We evaluated states in the five primary policy areas in which they are pursuing energy efficiency:

- Utility and public benefits programs and policies[1]
- Transportation policies
- Building energy efficiency policies
- State government–led initiatives around energy efficiency
- Appliance and equipment standards

We allocated points among the policy areas to reflect the relative magnitude of energy savings possible through the measures scored. We relied on our analysis of scholarly work and the judgment of ACEEE staff and outside experts about the impact of state policies on energy efficiency in the sectors we covered. A variety of cross-sector potential studies have informed our understanding of the energy savings available in each policy area and have led to ongoing refinements in our scoring methodology (Geller et al. 2007; Neubauer et al. 2009, 2011; Eldridge, Elliott, and Vaidyanathan 2010; Molina et al. 2011; Hayes et al. 2014).

Of the 50 total points possible, we allocated 20 points (40%) to utility and public benefits program and policy metrics, 12 points (24%) to transportation policies and programs, 9 points (18%) to building energy efficiency policies, 6 points (12%) to state-led initiatives (such as lead-by-example programs and state-sponsored incentives), and 3 points (6%) to state appliance and equipment standards.

Within each policy area, we developed a scoring methodology based on a diverse set of criteria that we detail in each policy chapter. We used these criteria to assign a score to each

[1] A public benefits fund provides long-term funding for energy efficiency initiatives, usually through a small surcharge on electricity consumption on customers' bills.

state. The scores were informed by responses to data requests sent to state energy officials, public utility commission (PUC) staff, and experts in each policy area. To the best of our knowledge, policy information included in this report is current as of July 2020. However, some performance-based scoring categories, such as those in Chapter 2 (utility programs), are informed by the latest available data from 2019 program years.

Table 1 outlines the scoring.

Table 1. Scoring by policy area and metrics

Policy areas and metrics	Maximum score	% of total points
Utility and public benefits programs and policies	20	40%
Incremental savings from electricity efficiency programs	7	14%
Incremental savings from natural gas and fuels efficiency programs	3	6%
Spending on electricity efficiency programs	2.5	5%
Spending on natural gas efficiency programs	1.5	3%
Large-customer opt-out programs*	(–1)	NA
Energy efficiency resource standards (EERS)	3	6%
Performance incentives and fixed-cost recovery	2	4%
Support of low-income energy efficiency programs	1	2%
Transportation policies	12	24%
GHG tailpipe emissions standards	1.5	3%
Electric vehicle (EV) registrations	1	2%
EV fees	1	2%
Electric vehicle supply equipment (EVSE)	1	2%
High-efficiency vehicle consumer incentives	0.5	1%
Targets to reduce vehicle miles traveled (VMT)	1	2%
Change in VMT	1	2%
Integration of transportation and land-use planning	1	2%
Complete streets policies	0.5	1%
Transit funding	1	2%
Transit legislation	0.5	1%
Freight system efficiency goals	1	2%
Equitable transportation policies	1	2%
Building energy efficiency policies	9	18%
Level of code stringency	4	8%
Code compliance study	1	2%
Code enforcement activities	1	2%

Policy areas and metrics	Maximum score	% of total points
Energy transparency policies	1	2%
Residential energy labeling	0.5	1%
Existing buildings standards	1	2%
Zero-energy buildings	0.5	1%
State government initiatives	6	12%
Financial incentives	2.5	5%
Lead-by-example efforts in state facilities and fleets	2	4%
Carbon pricing	1.5	3%
Appliance and equipment efficiency standards	3	6%
Maximum total score	50	100%

* We deducted points for programs and policies that are detrimental to energy efficiency.

The *State Scorecard* is meant to reflect the current policy landscape, incorporating changes from year to year. We do not envision that the allocation of points will forever remain the same; rather, we will continue to adjust our methodology to reflect the current energy efficiency policy and program environment. Point allocations can change both within and across policy categories. This year we shifted points to both the transportation and buildings chapters to accommodate new metrics recognizing state progress on electric vehicle adoption and zero-energy buildings, as well as to credit states adopting efficiency standards for existing buildings. As part of this shift, we removed the chapter dedicated to policies addressing combined heat and power (CHP) technologies. This removal is no way intended to diminish the important carbon benefits of CHP, especially with regard to the efficient use of natural gas. We note that CHP savings reported by utility programs continue to be counted in Chapter 2 of the *Scorecard*. In the long run, CHP remains an important tool for displacing fossil fuel emissions; however, its value in reducing emissions varies by state, depending on the grid mix in each. We give further detail on these changes later in this chapter and discuss them in more depth in the relevant policy chapters.

Changes in future editions of the *Scorecard* could include further revisions to point allocations and the addition or subtraction of entire categories of scoring. In making these changes, we seek to faithfully represent states' evolving efforts to realize the potential for energy efficiency in the systems and sectors of their economies.

STATE DATA COLLECTION AND REVIEW

We rely on outreach to state-level stakeholders to verify the accuracy and comprehensiveness of the policy information that we use to score the states. As in past years, we asked each state utility commission to review statewide data for the customer-funded energy efficiency programs presented in Chapter 2. Thirty-five state commissions responded.

We also asked each state energy office to review information on transportation policies (Chapter 3), building energy codes (Chapter 4), and state government initiatives (Chapter 5).

We received responses from energy offices in 38 states. In addition, we gave state energy office and utility commission officials the opportunity to review and submit updates to the material in ACEEE's State and Local Policy Database (ACEEE 2020b).[2] We also asked them to review and provide comments on a draft version of this *Scorecard* prior to publication. We used publicly available data and responses from prior years to evaluate states that did not respond to this year's data request or requests for review.

Best-Practice Policy and Performance Metrics

The scoring framework described above is our best attempt to represent our more than 32 efficiency metrics as a quantitative score. Converting spending data, energy savings data, and policy adoption metrics spanning five policy areas into one score clearly involves some simplification. Quantitative energy savings performance metrics are confined mostly to programs run by utilities and statewide or third-party administrators using ratepayer funds. These programs are subject to strict evaluation, measurement, and verification standards. States engage in many other efforts to encourage efficiency, but such efforts are typically not evaluated with the same rigor, so it is difficult to capture comprehensive quantitative data for these programs.

Although our preference is to include metrics based on energy savings achieved in every sector, the lack of consistent ex post data makes this unrealistic. Therefore, except for utility policies, we have not scored the other policy areas on spending or reported savings attributable to a particular policy action. Instead, we have developed best-practice metrics for scoring the states. In most cases these metrics do not score outcomes directly but rather credit states that are implementing policies likely to lead to gains in energy efficiency. For example, we give credit for *potential* energy savings from improved building energy codes and appliance efficiency standards, since *actual* savings from these policies are rarely evaluated. We have also attempted to reflect outcome metrics to the extent possible; for example, electric vehicle (EV) registrations, reductions in vehicle miles traveled (VMT), and a recently introduced metric for number of publicly available electric vehicle charging stations all represent measurable results of transportation policies. We include a full discussion of the policy and performance metrics in each chapter.

AREAS BEYOND OUR SCOPE: LOCAL AND FEDERAL EFFORTS

Energy efficiency initiatives implemented by actors at the federal or local level or in the private sector (with the exception of investor-owned utilities) generally fall outside the scope of this report. It is important to note that regions, counties, and municipalities have become actively involved in developing energy efficiency programs, a positive development that reinforces state-level efficiency efforts. ACEEE's *City Clean Energy Scorecard* (Ribeiro et al. 2020) captures data on these local actions; we do not specifically track them in the *State Scorecard*. However, a few *State Scorecard* metrics do capture local-level efforts, including the adoption of building codes and land-use policies, as well as state financial incentives for local energy efficiency initiatives. We also include municipal utilities in our data set to the extent that they report energy efficiency data to the U.S. Energy Information Administration

[2] Available at database.aceee.org.

(EIA), state PUCs, or other state and regional groups. As much as possible, however, we focus on state-level energy efficiency activities.

The *State Scorecard* has not traditionally covered private-sector investments in efficient technologies outside of customer-funded or government-sponsored energy efficiency initiatives, codes, or standards. We do recognize the need for metrics that capture the rapidly growing role of private financing mechanisms. We currently track states with active Property Assessed Clean Energy (PACE) programs, green bank financing, and loan programs offered by state agencies. However, incompleteness and variations in reporting program results have made development of a fair and transparent performance-based scoring metric a challenge. Until the reliability and completeness of savings data from these private initiatives improve, we award points for the presence of such programs but stop short of crediting levels of funding or savings. In cases in which this information was made available, we have included it in Appendix L.

THIS YEAR'S CHANGES IN SCORING METHODOLOGY

We updated our scoring methodology in several policy areas this year to reflect the changing policy landscape. Specifically, we recognize increasing efforts by states to support vehicle electrification and promote zero-energy buildings as strategies to improve efficiency and reduce emissions. We should note also that our methodology development and data collection for this report occurred in the winter and spring of 2020 as the initial impacts of the COVID-19 pandemic were still being understood. As a result, our scoring assessment does not directly address changes to efficiency policies or programs or stimulus efforts that states may have made to adapt or strengthen programs in response to the crisis.

Past *Scorecard*s have considered state EV registration rates and have awarded points to the 12 states currently administering California's Zero-Emission Vehicle (ZEV) program. This year we have added two additional EV-related scoring categories to Chapter 3 to capture policies that help accelerate the adoption of electric vehicles. One new metric tracks the number of publicly available charging stations per capita. While states can prioritize various channels and policies to increase investment in EV charging infrastructure, we hope that by using an outcome-based count of available chargers we can provide an objective assessment of state success in this area. The other new scoring category considers the stringency of EV fees assessed by states in an effort to recoup lost gasoline-tax revenues. While it makes sense for all vehicle owners to contribute to the maintenance of the roads they drive on, we deducted points for states with inordinately high surcharges that disincentivize EV uptake.

We have also updated our chapter on buildings policies, with two new metrics that credit states leading the way in targeting energy waste in existing buildings and paving the way for zero-energy buildings (ZEBs). While building energy codes address efficiency in new construction, a number of jurisdictions, particularly at the city level, have set energy performance standards to drive change in the existing building stock. In 2019 Washington State became the first to adopt such a standard at the state level as part of its Clean Buildings Act and is thus the first to earn a point in this important new *Scorecard* metric. Also, a growing number of states, through codes and other incentives, are prioritizing construction of ZEBs—buildings that produce at least as much energy as they consume—as a strategy to rapidly reduce emissions. Using data from the New Buildings Institute, our

other new metric is based on the number of verified and emerging ZEBs constructed in each state. To accommodate these changes, we removed a previous metric that credited states for requiring code officials to complete energy efficiency–related training and certification.

In addition, this year we removed our chapter on CHP-supportive policies. While CHP serves an important energy-saving role, especially in industrial applications, by recovering heat that would be wasted otherwise, our decision was based on feedback from states, some of which noted that the future role of CHP as a clean energy resource has grown more complex and variable depending on local grid energy mixes. The chapter's removal will also avoid penalizing states in which higher levels of zero-emission resources make CHP less attractive as a policy priority. We note, however, that savings from CHP are already counted to some degree in Chapter 2, to the extent that they are captured in utility savings reporting.

In Chapter 6, which evaluates state government–led initiatives, we refined our carbon metric, first introduced last year to recognize states aligning energy efficiency programs with statewide climate and emissions goals. Last year's *Scorecard* credited those states supporting energy efficiency programs through proceeds from carbon pricing policies (primarily through the Regional Greenhouse Gas Initiative and California's cap-and-trade program). We have built on this with two new metrics, one crediting states that are actively tracking greenhouse gas (GHG) emissions avoided through energy efficiency programs, the other crediting those that consider the avoided carbon benefits of efficiency in assessing the cost effectiveness of utility energy savings programs. To accommodate these additions, we retired a previous metric tracking state-sponsored R&D programs with a focus on energy efficiency because most states were earning points and it was no longer a useful differentiator. However, we do continue to include this information in ACEEE's State and Local Policy Database (ACEEE 2020b).

2020 STATE ENERGY EFFICIENCY SCORECARD *RESULTS*

We present the results of the *State Scorecard* in figure 1 and describe them more fully in table 2. In this section, we also highlight some key changes in state rankings, discuss which states are making notable new commitments to energy efficiency, and provide recommendations for states wanting to increase their energy efficiency.

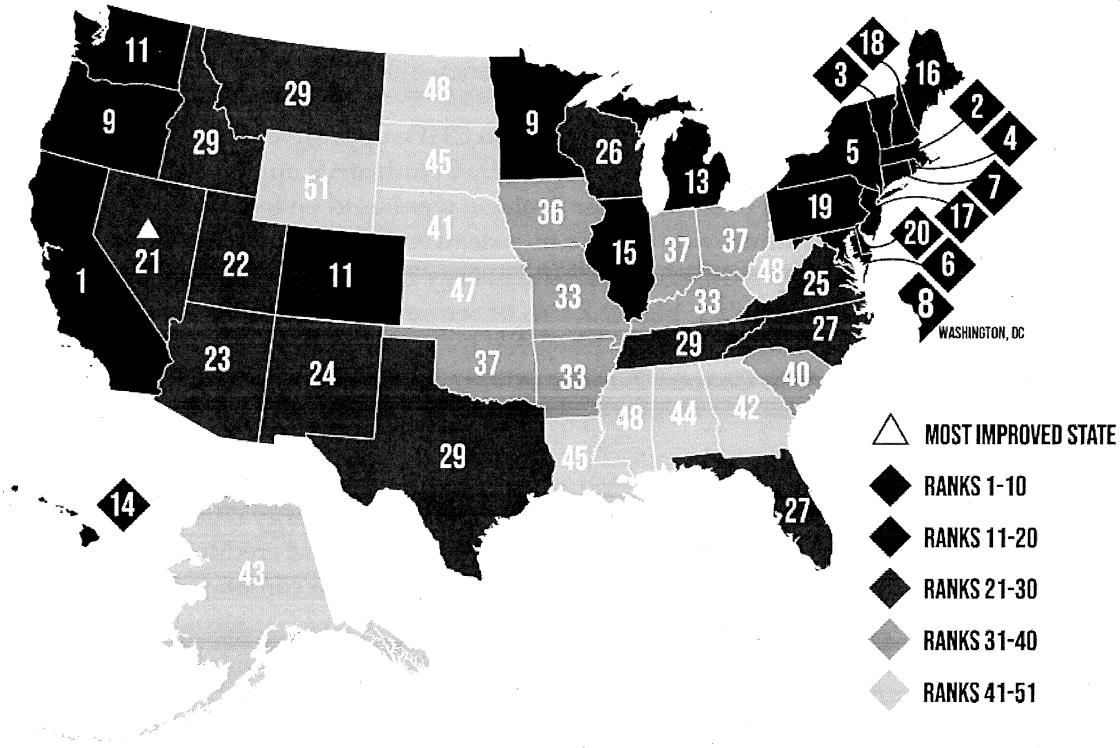

Figure 1. *2020 State Scorecard* rankings

Table 2. Summary of state scores in the *2020 State Scorecard*

Rank	State	Utility and public benefits programs & policies (20 pts.)	Trans-portation policies (12 pts.)	Building energy efficiency policies (9 pts.)	State government initiatives (6 pts.)	Appliance efficiency standards (3 pts.)	**TOTAL SCORE (50 pts.)**	Change in rank from 2019	Change in score from 2019
1	California	16	10.5	7.5	6	3	43	1	-0.5
2	Massachusetts	19.5	10	7	6	0	42.5	-1	-2
3	Vermont	17.5	8.5	6	6	2	40	0	-0.5
4	Rhode Island	19.5	8	6	6	0	39.5	-1	-1
5	New York	13.5	10.5	6.5	5.5	0.5	36.5	0	-0.5
6	Maryland	13.5	9.5	6	5.5	0	34.5	1	0
7	Connecticut	12.5	8.5	6.5	6	0	33.5	-1	-3
8	District of Columbia	9.5	11	8.5	4	0	33	3	4
9	Minnesota	13	7	6.5	5.5	0	32	-1	-0.5
9	Oregon	11	8.5	7	5.5	0	32	0	0
11	Colorado	9.5	7.5	6	5.5	2	30.5	3	3.5
11	Washington	7.5	8.5	7.5	5	2	30.5	-1	-1
13	Michigan	13	5.5	6.5	3.5	0	28.5	0	0
14	Hawaii	11	6	7	2.5	1.5	28	2	2.5
15	Illinois	12	5	6	4	0	27	-4	-2
16	Maine	9	7.5	4.5	5.5	0	26.5	-1	0.5
17	New Jersey	8.5	7	6.5	3	0	25	0	1
18	New Hampshire	10	3.5	5.5	5.5	0	24.5	2	3.5
19	Pennsylvania	4	6.5	6.5	5	0	22	-1	-1.5
20	Delaware	3.5	6.5	5.5	6	0	21.5	1	1
21	Nevada	5	4	6.5	4.5	1	21	5	5.5
22	Utah	6.5	4.5	6	3.5	0	20.5	0	1
23	Arizona	8.5	5	4.5	2	0	20	-4	-1.5
24	New Mexico	6.5	3.5	4.5	4	0	18.5	9	4.5
25	Virginia	1.5	6	5.5	5	0	18	4	3
26	Wisconsin	7.5	2.5	3	4	0	17	-1	1
27	Florida	1.5	5	6	4	0	16.5	-3	0
27	North Carolina	3	4.5	5	4	0	16.5	-1	1
29	Idaho	6	1	5.5	2	0	14.5	1	0
29	Montana	3.5	2.5	5.5	3	0	14.5	7	2
29	Tennessee	1	5	3.5	5	0	14.5	1	0
29	Texas	1	3.5	6.5	3.5	0	14.5	-3	-1
33	Arkansas	7	0	3	3.5	0	13.5	0	-0.5
33	Kentucky	1.5	3	5	4	0	13.5	5	2.5
33	Missouri	2.5	3	4	4	0	13.5	-3	-1
36	Iowa	4	3.5	4	1	0	12.5	-13	-6
37	Indiana	4	3	3	1.5	0	11.5	3	1
37	Ohio	4	0.5	3.5	3.5	0	11.5	-4	-2.5
37	Oklahoma	4	3.5	1.5	2.5	0	11.5	0	-0.5
40	South Carolina	2	2.5	2.5	4	0	11	0	0.5
41	Nebraska	0.5	2	6	2	0	10.5	2	1
42	Georgia	2	1.5	4.5	2	0	10	-4	-1
43	Alaska	1	3.5	1.5	3.5	0	9.5	-3	-1
44	Alabama	0	0.5	5.5	3	0	9	-1	-0.5
45	Louisiana	0.5	3	2	2.5	0	8	3	1.5
45	South Dakota	2	2	3.5	0.5	0	8	1	1
47	Kansas	0.5	2	3.5	1	0	7	-1	0
48	Mississippi	2	0.5	0.5	2.5	0	5.5	-3	-2.5
48	North Dakota	0	2	3	0.5	0	5.5	2	0.5
48	West Virginia	-1	1	4	1.5	0	5.5	0	-1
51	Wyoming	1	0.5	0	2.5	0	4	0	-0.5

How to Interpret Results

Although we provide individual state scores and rankings, the differences among the states are most instructive when considered in tiers of 10. Relatively few points separate states' total scores in the middle tiers: just 6.5 points in the third tier and 2.5 points in the fourth. These middle tiers also have a significant number of states tied in the rankings. For example, in the third tier, Idaho, Montana, Tennessee, and Texas are tied for 29th. Small improvements in energy efficiency will likely have a significant effect on the rankings of states in the middle tiers. Conversely, idling states will easily fall behind as other states in this large group ramp up their efficiency efforts.

The top tier exhibits more variation in scoring, stretching across an 11-point range. California, Massachusetts, and Vermont were the only states scoring 40 or more points this year. Others in the top tier are also well-established high scorers. Generally speaking, the highest-ranking states have all made broad, long-term commitments to energy efficiency, indicated by their staying power at the top of the *State Scorecard* over the past decade. However, it is important to note that retaining one's spot in the lead pack is no easy task; all of these states must embrace new, cutting-edge strategies and programs to remain at the top.

2020 Leading States

California returned to first place this year, its fifth time taking the top spot since the *Scorecard*'s inception in 2007 and a feat it last accomplished in 2016, when it tied with Massachusetts. For its part, the Bay State followed just a half-point behind to take second place. Massachusetts continues to lead on multiple fronts, including with advanced efforts to integrate efficiency with state electrification and decarbonization strategies, currently seen in only a handful of states.

California's enduring leadership on building energy codes, vehicle emissions, and appliance standards continues to set the pace in advancing energy efficiency on a variety of fronts—not just within the state's borders but at the national level. Other states have modeled their own policies after California's example, with more than a dozen states adopting its low-emissions vehicle regulations and 11 implementing its zero-emission vehicle program. Together with California, these states have created an important unified front against ongoing federal efforts to revoke states' ability to set stricter vehicle standards. California's other pivotal achievements this year included expanded investment in high-efficiency heat pump water heaters (HPWHs), along with updates to the state's building energy code to award compliance credits to builders for adoption of smart HPWHs in recognition of their unique benefits toward slashing emissions and providing demand flexibility. The state also continued to maintain progress on important appliance standards, notably expanding the scope of its strong light bulb standards last November in the face of federal efforts to reverse course on similar national standards.

Driven by the strength of a robust policy framework under the state's 2008 Green Communities Act, **Massachusetts** continues to deliver nation-leading levels of utility savings alongside comprehensive programs and policies to strengthen efficiency in the buildings and transportation sectors. Among these policies are incentives for electric vehicles and strong building energy codes based on the 2018 International Energy Conservation Code (IECC), including strengthening amendments for solar readiness. In

recent years the state has taken major steps to better align energy efficiency with emissions reduction goals under its Global Warming Solutions Act. For instance, it has made policy revisions to enable strategic electrification through measures that switch homeowners from oil and propane furnaces to electric heat pumps, and it has launched incentives to reduce winter and summer peak demand. Other major policy advances this year include instituting a Clean Peak Standard, crediting clean energy delivered during hours of peak demand.

Vermont continued its now seven-year streak in the *Scorecard* top five. The state's energy efficiency resource standard is among the strongest in the nation, consistently delivering utility savings exceeding 2% of sales. Vermont is also among the states that have passed legislation (H 410) putting national appliance and light bulb standards into state law in order to protect against federal rollbacks. In addition, H 410, signed in 2018, established efficiency standards for 16 appliances not covered at the federal level, which are expected to cumulatively save consumers $210 million by 2035 and help meet the state's carbon emissions goals. The Green Mountain State has also maintained progress on buildings efficiency, adopting the 2018 IECC and ASHRAE Standard 90.1-2016 as part of an update to its residential and commercial building energy standards, which took effect this year.

Rhode Island ranks fourth this year, thanks to the success of its nation-leading utility savings targets and a mandate to procure all cost-effective energy efficiency.[3] Building decarbonization has been a growing priority for the state in recent years, with the introduction of voluntary stretch codes for construction and renovation projects in 2018 and ongoing support of zero-energy buildings. The state is also targeting energy efficiency among delivered-fuels customers, an often overlooked sector, and this year released a heating sector transformation report identifying solutions to reduce emissions through renewable fuels and a transition to electric ground source or air source heat pumps.[4] The state has also leveraged utility-led efficiency programs as a means to enhance the workforce through targeted training and recruitment opportunities, helping to increase the state's clean energy workforce by 25% since 2015. Rhode Island has also collaborated with Northeast Energy Efficiency Partnerships to increase the visibility of home energy data. In addition, the state leads by example with clear energy goals established for state agencies.

New York rounds out the top five for the second straight year. The state's utilities and energy community worked to update policies and programs to meet ambitious goals to achieve a net-zero carbon economy under the 2019 Climate Leadership and Community Protection Act (CLCPA). In January the state's Public Service Commission issued an order setting ambitious energy efficiency and building decarbonization targets in pursuit of the state goal to achieve 185 TBtus of savings by 2025. The state's efficiency goals are notable for being among the first in a next generation of fuel-neutral energy efficiency resource standards that integrate beneficial electrification and include a separate heat pump target.

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[3] "All cost-effective" requirements call on utilities to determine and invest in the maximum amount of cost-effective efficiency feasible. States use a variety of methods and assumptions for determining cost effectiveness, which will influence calculations of potential savings.

[4] Delivered fuels include fuel oil, kerosene, propane, and wood. Also referred to as "unregulated fuels," these are commonly not subject to utility energy efficiency rules, and savings associated with delivered fuels have historically not been tracked in most cases.

Also going into effect this year was NYStretch Energy Code 2020—the state's first voluntary, locally adoptable stretch code, providing savings of roughly 11% over the state's base code. Other recent achievements include the release of a new state freight plan with efficiency performance measures, as well as the signing of a bill in late 2019 strengthening efficiency standards for faucets, showerheads, and other plumbing fixtures.

States rounding out the top 10 are Maryland, Connecticut, the District of Columbia, Minnesota, and Oregon. Each has established strong policy structures, incentives, and standards to drive savings through utility programs, efficient new construction, and improved sustainability in the transportation sector.

Table 3 shows the number of years that states have been in the top 5 and top 10 spots in the *State Scorecard* rankings since their inception in 2007.

Table 3. Leading states in the *State Scorecard*, by years at the top

State	Years in top 5	Years in top 10
California	14	14
Massachusetts	13	14
Vermont	12	14
Oregon	10	14
New York	9	14
Connecticut	6	14
Rhode Island	8	13
Washington	1	13
Minnesota	0	13
Maryland	0	10
Illinois	0	2
Maine	0	2
New Jersey	0	2
District of Columbia	0	1
Wisconsin	0	1

Since the first edition of the *State Scorecard,* eight states have occupied the top 5 spots, and 14 and the District of Columbia have appeared somewhere in the top 10. California is the only state to have earned a spot among the top 5 in all 14 years, followed by Massachusetts for 13 years and Vermont for 12. New Jersey, Washington, Wisconsin, Illinois, and Maine have all placed in the top 10 in the past, but none scored high enough to rank in the top tier this year.

Changes in Results Compared with *The 2019 State Energy Efficiency Scorecard*

Overall, 20 states and the District of Columbia had higher total scores and 23 states had lower total scores this year compared with last year's *Scorecard*. Seven states had no change in score.[5] Table 4 shows point gains and losses in greater detail.

Table 4. Number of states gaining or losing points compared with 2019, by policy area

Policy category	States gaining points		No change		States losing points	
Utility and public benefits	14	27%	22	43%	15	29%
Transportation*	41	80%	3	6%	7	14%
Building energy codes	21	41%	21	41%	9	18%
State government initiatives	14	27%	21	41%	16	31%
Appliance standards	2	4%	47	92%	2	4%
Total score	21	41%	7	14%	23	45%

Percentages may not total 100 due to rounding. *Due to an adjustment to the scoring methodology that reallocated points from the discontinued CHP chapter to transportation and buildings policies, a relatively high number of states saw significant point gains in these categories.

The fact that 23 states lost points this year should not necessarily be interpreted as a sign that they are losing ground. Given the number of metrics in the *State Scorecard* and states' varying efforts, movement should be expected. The landscape for energy efficiency is in constant flux, and changes in state scores reflect a variety of factors. These include adjustments to our *Scorecard* methodology this year to reflect emerging state policies such as those supporting expansion of electric vehicle charging infrastructure, zero-energy construction, and alignment of efficiency policies with broader state decarbonization goals.

Leaving aside methodology, the number of states losing points this year does not indicate a lack of nationwide progress. On the contrary, several states, including Massachusetts, New Jersey, New Mexico, New York, and Virginia, have renewed, extended, or strengthened energy efficiency targets to help lay the groundwork for future savings. As mentioned earlier, savings from electric efficiency programs administered in 2019 totaled approximately 26.9 million MWh, equivalent to about 0.70% of total retail electricity sales in the United States. And this does not include ongoing savings from energy efficiency measures installed in earlier years that continue to save energy. Those savings amounted to more than 270 million MWh in 2019, approximately 7% of electricity consumption. More information on state scores for utility programs is included in Chapter 2.

Most-Improved States

Relative to last year, this year's most-improved state was **Nevada**. Also showing major improvement were New Mexico, Colorado, New Hampshire, the District of Columbia, and Virginia. All of these states added at least 3 points to their scores to move up in the rankings. Table 5 shows changes in points and rank compared with last year for these states.

[5] The *State Scorecard* looks at all 50 states and the District of Columbia, which is treated as a state under DOE Program Rule 10 CFR Part 420–State Energy Program.

Table 5. Changes from 2019 for most-improved states

	Change in score	Change in rank	2020 ranking	2019 ranking
Nevada	+5.5	+5	21	26
New Mexico	+4.5	+9	24	33
District of Columbia	+4	+4	8	11
Colorado	+3.5	+3	11	14
New Hampshire	+3.5	+2	18	20
Virginia	+3	+4	25	29

Following 2017 state legislation mandating energy efficiency savings targets, **Nevada** has advanced energy efficiency on multiple policy fronts. The governor also signed AB54 last year, adopting federal standards into law in order to protect against the current presidential administration's efforts to roll back energy-saving light bulb standards. The state has adopted the 2018 IECC for residential and commercial buildings, and it works with local governments to increase adoption and compliance. In June the state's environmental agency announced plans to adopt California's vehicle emission standards and Zero-Emission Vehicle (ZEV) mandate. The state also passed legislation in 2019 setting a goal for 100% carbon-free electricity by 2050.

The **District of Columbia** maintains a diverse suite of strong energy efficiency policies that helped propel it into the *Scorecard*'s top 10 this year. In 2019 the District passed the Clean Energy DC (CEDC) Act, the most ambitious renewable portfolio standard in the nation, with a commitment to transition to 100% renewable energy by 2032. The bill also expanded building benchmarking, created energy performance standards for existing buildings, and added funding to the District's new green bank. DC is also working to produce a Transportation Electrification Roadmap per the CEDC to shift its transportation sector from traditional fossil fuels to high-efficiency zero-emission vehicles and align with the District's overarching goal of becoming carbon neutral by 2050.

New Mexico moved forward on a number of important efficiency initiatives in the wake of a pivotal 2019 in which lawmakers signed the Energy Transition Act, committing public utilities to a zero-carbon electricity goal by 2045. Utilities are also strengthening efficiency programs in response to HB-291, which set a new 2025 target to achieve savings of 5% relative to 2020 sales, raised the cap on efficiency spending, and enabled decoupling, in effect removing the disincentive for utilities to save energy. Additionally, an executive order issued by the governor last year moved the state to replace its long-outdated energy codes for new construction with the latest 2018 IECC model codes, turning the corner for buildings sector efficiency. The governor has also called for the state's adoption of stronger fuel economy standards in 2020. And 2019 legislation requires public utilities to submit electric vehicle infrastructure plans by 2021.

Colorado continues to deliver strong levels of utility energy savings in response to more ambitious efficiency goals for Xcel Energy in recent years. Last year the state took a major step forward in strengthening efficiency in new construction with the adoption of HB 19-1260. The law requires local governments to adopt and enforce, at a minimum, one of the three most recent versions of International Code Council energy codes upon updating any other building code. Colorado has also adopted strict vehicle emissions standards aligned with those of California, joining 13 other states that have already done so and helping Colorado move toward its target of cutting greenhouse gas (GHG) emissions 26% by 2025. The state also has comprehensive appliance standards, which include protection against a federal rollback of lighting standards.

In **New Hampshire**, utility-sector savings have gradually ramped up in recent years since the state established its first energy efficiency resource standard in 2016. New Hampshire is also a member of the Regional Greenhouse Gas Initiative (RGGI), the regional cap-and-trade program designed to reduce emissions, and has directed roughly half of its RGGI auction proceeds toward energy efficiency since 2009. As of November 2020, utilities have also proposed significantly higher savings goals for 2021–2023, which could be approved by state regulators in December.

In **Virginia**, the governor's signing of the Virginia Clean Economy Act (VCEA) was a major contributor to the state's 3-point improvement. The VCEA is among the top energy stories of 2020, creating the commonwealth's first clean energy standard and making it the first state in the Southeast with a 100% clean electricity goal. The VCEA also established an energy efficiency resource standard that sets multiyear electric savings targets for utilities. To support low-income customers, it includes measures to reduce energy burdens and also establishes a Percentage of Income Payment Program (PIPP), which caps the monthly electric payment of low-income participants at 6% of income for those with gas heat or 10% for those with electric heat (Virginia General Assembly 2020). The governor also signed HB 981 to make Virginia the first southern state to join RGGI, with proceeds going toward energy efficiency, renewable energy, and climate mitigation measures. As the state's utilities design and administer new customer demand-side offerings to meet VCEA goals, we anticipate the state's *Scorecard* performance will continue to improve alongside the accrual of future savings.

States Losing Ground

Twenty-one states fell in the rankings this year due to factors such as greater progress by other states and changes to the scoring methodology in several categories, including the shifting of points toward the buildings and transportation categories. This loss of ground indicates the complex relationship between changes in total score and changes in rank. Of the 23 states that lost points, 16 fell in the rankings, 6 did not change, and 1 state, California, improved to first place despite a half-point loss. The fall in rank of several states may appear incommensurate with their relatively minor loss of points relative to last year. But given the number of metrics covered in the *State Scorecard* and states' differing efforts, relative movement among the states should be expected. As mentioned earlier, the difference among states' total scores, particularly in the middle tiers of the *State Scorecard*, is small; as a result, idling states can easily fall behind in the rankings as others ramp up efforts to become more energy efficient.

Iowa lost 6 points, falling 13 positions to 36th place, the steepest point loss and fall in rankings in 2020. Previously ranked 15th as recently as 2016, the Hawkeye State felt the impact of 2018 legislation that imposes a stifling spending cap on demand-side investment and allows customers to opt out of paying for programs that fail to pass the Ratepayer Impact Measure, a cost-effectiveness test that fails to account for societal savings benefits. The result was a steep drop-off in utility-reported electric and gas savings in 2019, moving Iowa into the bottom half of the *Scorecard*.

In general, we see three trends among the states losing ground in the *State Scorecard*. First, many of those falling behind are not increasing energy savings year after year and are therefore being outpaced as other states ramp up programs to meet higher savings targets. States losing ground typically have not fully implemented changes to the utility business model that encourage utilities to take full advantage of energy efficiency as a resource, including through decoupling, performance incentives, and energy savings targets.

Second, opt-out provisions have been approved in many of the states falling behind in the *State Scorecard* rankings. These provisions allow large customers to avoid paying into energy efficiency programs, forcing other customers to subsidize them while limiting savings achieved by utilities.

Finally, a handful of states, particularly Iowa and Ohio, have passed damaging legislation that has weakened or rolled back energy efficiency programs. For example, Ohio's HB 6, signed in 2019, effectively ended the state's energy efficiency resource standard and prohibits utility cost recovery for efficiency programs. This has led to the anticipated termination of energy efficiency programs statewide by the end of 2020, with the exception of some low-income weatherization programs. Ohio fell four places in this year's rankings, from 33rd to 37th place.

STRATEGIES FOR IMPROVING ENERGY EFFICIENCY

A variety of policy tools and program designs are available to state officials to strengthen efforts to save energy across multiple use sectors. The following list highlights examples of best practices by state policymakers seeking to improve energy efficiency performance by energy utilities, in the buildings and transportation sectors, and through appliance standards. We also highlight best practices that reduce legal and market barriers to investing in energy efficiency and expand participation in programs that achieve savings.

Establish and adequately fund an energy efficiency resource standard (EERS) or similar energy savings target. EERS policies set specific energy savings targets that utilities or independent statewide program administrators must meet through customer energy efficiency programs. They serve as an enabling framework for cost-effective investment, savings, and program activity. As states address evolving priorities such as decarbonization, cost, equity, and grid value, regulators in places like Massachusetts and New York are adjusting targets to incorporate multiple goals (e.g., fuel-neutral savings) that better align efficiency programs with electrification and GHG reduction objectives.

Examples: Arkansas, Colorado, Massachusetts, Michigan, Minnesota, New Jersey, New York, Virginia

Adopt California tailpipe emissions standards and set quantitative targets for reducing VMT. Transportation consumes almost 30% of the total energy used in the United States (EPA 2020b). At the state level, a comprehensive approach to transportation energy efficiency must address both individual vehicles and the entire transportation system. A variety of state-level policy options are available to improve transportation system efficiency. These include codifying targets for reducing VMT and integrating land use and transportation planning to create sustainable communities with access to multiple modes of travel. While federal fuel economy standards are expected to go a long way toward reducing fuel consumption, standards for model years 2022–2025 face an uncertain future following the April 2020 release of federal rollbacks. States that adopt California's tailpipe emissions standards will lead the way toward clean, fuel-efficient vehicles.

Examples: California, Colorado, Massachusetts, New York, Oregon

Ensure energy efficiency and clean energy investments and opportunities are inclusive and that benefits accrue to all customers, especially households overburdened by energy costs. Historically marginalized groups have been underserved and underrepresented in clean energy planning and policymaking. States can foster equity in key decision-making processes by ensuring these efforts are inclusive and designed with all communities in mind. These include establishing internal metrics and frameworks that evaluate the degree to which policy and program outcomes are equitable, developing stakeholder processes and community assessments to better understand the needs of marginalized groups, and adopting inclusive workforce development practices to offer new economic and educational opportunities for groups often underrepresented in the energy efficiency workforce. States can also strengthen incentives and programs for income-qualified customers, and to work with utilities and regulators to recognize and value program nonenergy benefits (NEBs), such as health and economic improvements, as a means of expanding these investments. States and public utility commissions (PUCs) can also include goals specific to the low-income sector, either within an EERS or as a stand-alone minimum acceptable threshold, to ensure investments are targeted toward these customers.

Examples: California, New Jersey, Oregon, Pennsylvania, Tennessee, Washington

Adopt updated, more stringent building energy codes, improve code compliance, and involve efficiency program administrators in code support. Buildings use more than 40% of the total energy consumed in the United States, making them an essential target for energy savings. Adopting mandatory building energy codes is one way to ensure a minimum level of energy efficiency for new residential and commercial buildings. Strategies such as energy performance standards, benchmarking and transparency policies, and financing tools to encourage deep retrofits are also critical for addressing efficiency in the existing building stock.

Examples: California, Illinois, Maryland, Nebraska, New Mexico, District of Columbia, Washington

Expand state government–led initiatives and make them visible. States can establish sustainable funding sources for energy efficiency incentive programs, invest in energy efficiency–related R&D and demonstration centers, and lead by example by incorporating

energy efficiency into government operations. In the latter area, they can reduce energy use in public buildings and fleets and use energy savings performance contracts (ESPCs) to finance energy-saving projects. States can also work with utilities and community-based organizations to promote and coordinate energy code compliance training and workforce development programs.

Examples: Alaska, Connecticut, New York

Explore and promote innovative financing mechanisms to leverage private capital and lower the up-front costs of energy efficiency measures. Although utilities in many states offer some form of on-bill financing program to promote energy efficiency in homes and buildings, expanding lender and customer participation has been an ongoing challenge. States can increase stakeholder awareness and pass legislation to address legal barriers to the implementation of financing programs. A growing number of states are seeking new ways to maximize the impact of public funds and invigorate energy efficiency by attracting private capital through emerging financing models such as PACE programs and green banks.

Examples: Colorado, Connecticut, Minnesota, Missouri, New York, Rhode Island

Adopt cost-effective efficiency standards for appliances, equipment, lighting, and plumbing products. State appliance standards are a proven policy that lowers utility bills for customers and businesses, reduces pollution, and helps spur national standards. Even when standards are not adopted at the federal level, adoption by just a few states can be enough to impact national markets. The Appliance Standards Awareness Project has recently outlined a menu of new or strengthened standards for 47 products that would reduce annual average household utility bills by more than $100 in 2030 and deliver cumulative utility bill savings of $1.1 trillion through 2050 for consumers and businesses.[6]

Examples: California, Colorado, Washington, Hawaii, Nevada, New York, Vermont

[6] Appliance Standards Awareness Project, *A Powerful Priority: How Appliance Standards Can Help Meet U.S. Climate Goals and Save Consumers Money* (Boston: ASAP, 2020). appliance-standards.org/sites/default/files/Powerful_Priority_Report.pdf.

Chapter 2. Utility and Public Benefits Programs and Policies

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INTRODUCTION

The utility sector is critical to implementing energy efficiency. Electric and natural gas utilities and independent statewide program administrators deliver a substantial share of electricity and natural gas efficiency programs in the United States.[17] These programs, funded by utility customers through utility rates and statewide public benefits funds, encourage customers to use efficient technologies and thereby reduce their energy waste. Energy efficiency is a resource—just as power plants, wind turbines, and solar panels are.

Utilities and administrators have been delivering energy efficiency programs and market transformation initiatives to customers for decades in some states, often driven by regulations from state utility commissions setting specific savings targets for residential, commercial, industrial, and income-qualified customers. And as a growing number of states have adopted increasingly ambitious clean energy goals, many are deploying energy efficiency integrated with controls as an important demand response and grid optimization resource to complement and facilitate the growing integration of renewable energy. ACEEE has also found that by scaling up energy efficiency across multiple end-use sectors, the United States can cut energy use and greenhouse gas emissions in half by 2050 (Ungar and Nadel 2019).

Utilities and administrators implement energy efficiency programs in all 50 states and the District of Columbia. Program approaches include financial incentives, such as rebates and loans; technical services, such as audits, retrofits, and training for architects, engineers, and building owners; behavioral strategies; and educational campaigns about the benefits of energy efficiency improvements. Utilities and administrators also continue to develop new and creative ways of delivering energy efficiency to their customers, including some customer segments that have been more difficult to serve, such as small businesses and multifamily housing occupants.

METHODOLOGY

For this chapter, we gathered statewide data on the following:

- Utility energy sales (electricity and natural gas) to customers in 2018 and 2019
- Utility revenues from retail energy sales in 2018 and 2019
- Number of residential natural gas customers in 2018
- Budgets for electricity and natural gas energy efficiency programs in 2019 and 2020
- Actual spending for electricity and natural gas energy efficiency programs in 2018 and 2019

[17] Other major programs, run by state governments, are discussed in Chapter 6. In addition, the U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP), started in 1976, provides weatherization services to approximately 35,000 homes every year using DOE funds. More than $200 million was dedicated annually to the program in both FY 2016 and FY 2017, though these are not considered within the *State Scorecard* given the report's state-level policy scope.

- Incremental net and gross electricity and natural gas energy efficiency program savings in 2018 and 2019[18]
- Incremental net and gross energy savings of unregulated fuels including fuel oil, kerosene, wood, and propane, where available, in 2018 and 2019
- Policies and regulations to encourage utility investment in energy efficiency
- Utility policies and programs related to large customers, including self-direct and opt-out provisions
- Policies and levels of spending related to utility investment in low-income energy efficiency programs
- Data access policies and provisions[19]

We sourced our data from information requests completed by state utility commissions and from the EIA (EIA 2020a, 2020c, 2020d). We also gathered information from regional efficiency groups.[20] We sent the data we gathered, along with last year's *State Scorecard* data, to state utility commissions and independent administrators for review. Table 6 shows overall scores for utility programs and policies. Tables 8, 10, 12, and 14 provide data on electricity and natural gas efficiency program savings and spending in the most recent years for which data were available.

SCORING AND RESULTS

This chapter reviews and ranks the states on the basis of their performance in implementing utility-sector efficiency programs and enabling policies that are evidence of a commitment to energy efficiency. The eight utility scoring metrics are

- Incremental electricity program savings as a percentage of retail sales (7 points)[21]
- Incremental natural gas and unregulated fuels program savings as a percentage of residential and commercial sales (3 points)
- Electricity program spending as a percentage of statewide electric utility revenues (2.5 points)
- Natural gas program spending per residential gas customer (1.5 points)

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[18] Gross savings are those expected from an energy efficiency program, crediting all installed efficiency measures, including those that would have been installed in the absence of the program. Net savings are those attributable to the program, typically estimated by subtracting savings from free riders (program participants who would have implemented or installed the measures without the incentive, or with a lesser incentive), and adding in estimates of savings from free drivers (program nonparticipants who implemented or installed the measures due to the program). States differ in how they define, measure, and account for free ridership and other components of the net savings calculation (Haeri and Khawaja 2012).

[19] We used this information from state responses to present best practices, not to develop scores.

[20] The six regional energy efficiency organizations (REEOs) are the Midwest Energy Efficiency Alliance (MEEA), Northeast Energy Efficiency Partnerships (NEEP), Northwest Energy Efficiency Alliance (NEEA), Southeast Energy Efficiency Alliance (SEEA), South-Central Partnership for Energy Efficiency as a Resource (SPEER), and Southwest Energy Efficiency Project (SWEEP). The REEOs work through funded partnerships with the U.S. DOE and with various stakeholders, such as utilities and advocacy groups, to provide technical assistance to states and municipalities in support of efficiency policy development, program design, and program implementation.

[21] ACEEE defines incremental savings as new savings from programs implemented in a given year. Incremental savings are distinct from cumulative savings, which are the savings in a given program year from all the measures implemented under the programs in that year and in prior years that are still saving energy.

- Opt-out provisions for large customers (–1 point)
- EERS for utilities and statewide program administrators (3 points)
- Utility business models that encourage energy efficiency, including performance incentives and revenue decoupling (2 points)
- Policies and utility funding in support of low-income energy efficiency programs (1 point)

In this category, a state could earn up to 20 points, or 40% of the 50 total points possible in the *State Scorecard*. We set this point allocation because the savings potential of utility and public benefits programs is approximately 40% of the total energy savings potential of all policy areas scored. Studies suggest that electricity programs typically achieve at least three times the primary energy savings of natural gas programs (Geller et al. 2007; Elliott et al. 2007a, 2007b; Eldridge et al. 2009). Utility-sector potential studies generally indicate significant untapped possible savings for natural gas efficiency programs (GDS 2013; Mosenthal et al. 2014; Nadel 2017; Minnesota DOC 2018). Therefore, we allocated 9.5 points to metrics for electricity programs measuring annual savings and spending and 4.5 points to metrics for natural gas and unregulated fuels programs measuring annual savings and spending. In an effort to recognize state policies and programs aimed at strengthening energy efficiency for low-income households—a sector that has historically experienced underinvestment due to policies of systemic social and economic exclusion—we introduced in the *2017 State Scorecard* a 1-point scoring category to capture these state efforts.

Hawaii consumes almost no natural gas (EIA 2019c), so it aims energy efficiency efforts at electricity only. To avoid penalizing the state for this, we awarded Hawaii points for natural gas efficiency spending, savings, and regulatory structures equivalent to the proportion of points it earned for corresponding electricity programs and policies.

We continue our practice of reporting programs' incremental energy savings (savings from measures installed in a given year) rather than their total annual energy savings (those achieved in a year from measures installed that year and in prior years) or cumulative savings. We report incremental savings in the *State Scorecard* for two reasons. First, basing our scoring on total annual savings or cumulative energy savings would involve levels of complexity that are beyond the scope of the *State Scorecard*, including identifying the start year for the cumulative series and accurately accounting for the life of energy efficiency measures and the persistence of savings. Second, the *State Scorecard* aims to provide a snapshot of states' current energy efficiency programs, and incremental savings give a clearer picture of recent efforts.

There are some other possible metrics we did not use for scoring. For instance, we did not attempt to include program cost effectiveness or level of spending per unit of energy savings. All states have cost-effectiveness requirements for energy efficiency programs (York, Cohn, and Kushler 2020). However, the wide diversity of measurement approaches across states makes comparison less than straightforward. Also, several states require program administrators to pursue all cost-effective efficiency. Although some states have prioritized low acquisition costs and encouraged maximizing the *degree* of cost effectiveness, promoting larger *amounts* of marginally cost-effective energy savings is another valid approach. We also

did not adjust savings for variations in avoided costs of energy across states, as there are examples of achieving deep energy savings in both high- and low-cost states.

Note that scores are for states as a whole and therefore may not be representative of the specific efforts of each utility within a state. A single utility or a small set of utilities may do very well in terms of energy efficiency programs and associated metrics (spending and savings), but when all utilities in a state are viewed cumulatively, such efforts can be masked in the *State Scorecard* by other utilities with lower performance. For more information on the energy savings performance of individual utilities, refer to *The 2020 Utility Energy Efficiency Scorecard* (Relf, Cooper, and Gold 2020), published by ACEEE.

Table 6 lists states' overall utility scores. Explanations of each metric follow.

Table 6. Summary of state scores for utility and public benefits programs and policies

State	2019 electricity program savings (7 pts.)	2019 natural gas and fuels program savings (3 pts.)	2019 electricity EE spending (2.5 pts.)	2019 gas program spending (1.5 pts.)	2020 opt-out provision (–1 pt.)	2020–2025 energy efficiency resource standard (3 pts.)	2020 performance incentives and fixed-cost recovery (2 pts.)	2019 low-income energy efficiency programs (1 pt.)	2020 total score (20 pts.)
Massachusetts	7	2.5	2.5	1.5	0	3	2	1	19.5
Rhode Island	7	2.5	2.5	1.5	0	3	2	1	19.5
Vermont	7	1	2.5	1.5	0	2.5	2	1	17.5
California	6	3	1.5	1	0	1.5	2	1	16
Maryland	7	0.5	1.5	0.5	0	2	1	1	13.5
New York	4	1.5	1.5	1	0	2.5	2	1	13.5
Michigan	4.5	2.5	1	1	0	1.5	1.5	1	13
Minnesota	3.5	2.5	1	1	0	2	2	1	13
Connecticut	4	1	1.5	1.5	0	1.5	2	1	12.5
Illinois	5	1.5	1.5	0.5	–1	2.5	1	1	12
Hawaii	4	2	0.5	0.5	0	1	2	1	11
Oregon	3.5	1.5	1.5	1	0	1.5	1	1	11
New Hampshire	3	0.5	1	1.5	0	1.5	1.5	1	10
Colorado	3	1	1	0.5	0	2	1.5	0.5	9.5
District of Columbia	4	2	0.5	0.5	0	0	1.5	1	9.5
Maine	3.5	0.5	1	1	0	1.5	0.5	1	9
Arizona	3	1	0.5	0	0	2.5	1	0.5	8.5
New Jersey	2	0.5	0.5	1	0	2	1.5	1	8.5
Washington	3	0.5	1	0.5	0	1	1	0.5	7.5
Wisconsin	2	1.5	0.5	0.5	0	1	1	1	7.5

State	2019 electricity program savings (7 pts.)	2019 natural gas and fuels program savings (3 pts.)	2019 electricity EE spending (2.5 pts.)	2019 gas program spending (1.5 pts.)	2020 opt-out provision (–1 pt.)	2020–2025 energy efficiency resource standard (3 pts.)	2020 performance incentives and fixed-cost recovery (2 pts.)	2019 low-income energy efficiency programs (1 pt.)	2020 total score (20 pts.)
Arkansas	2	1.5	0.5	0.5	–1	1.5	1.5	0.5	7
New Mexico	1.5	0.5	0.5	0.5	0	1	1.5	1	6.5
Utah	2	2	0.5	0.5	0	0	1	0.5	6.5
Idaho	3	0	1.5	0.5	0	0	0.5	0.5	6
Nevada	2	0	0.5	0	0	1	0.5	1	5
Indiana	2	0.5	0.5	0.5	–1	0	1	0.5	4
Iowa	2	0.5	0.5	0.5	–1	1	0	0.5	4
Ohio	3	0	0.5	0	–1	0	1	0.5	4
Oklahoma	1	0.5	0.5	0.5	–1	0	1.5	1	4
Pennsylvania	2	0	0.5	0	0	0.5	0	1	4
Delaware	0.5	0.5	0.5	1	0	0	0	1	3.5
Montana	1.5	0	0.5	0.5	0	0	0	1	3.5
North Carolina	2	0	0.5	0	–1	0	1	0.5	3
Missouri	2	0	0.5	0	–1	0	0.5	0.5	2.5
Georgia	0.5	0	0	0	0	0	1	0.5	2
Mississippi	0	0.5	0	0.5	0	0	0.5	0.5	2
South Carolina	1.5	0	0.5	0	–1	0	0.5	0.5	2
South Dakota	0.5	0	0	0	0	0	1.5	0	2
Florida	0	0	0	1	0	0	0	0.5	1.5
Kentucky	0.5	0	0	0	–1	0	1.5	0.5	1.5
Virginia	0	0	0	0	–1	1	0.5	1	1.5
Alaska	0	0	0	0	0	0	0	1	1
Tennessee	0	0	0	0	0	0	0.5	0.5	1
Texas	0.5	0	0	0	–1	0	0.5	1	1
Wyoming	0.5	0	0	0	0	0	0.5	0	1
Kansas	0	0	0	0	0	0	0	0.5	0.5
Louisiana	0	0	0	0	0	0	0.5	0	0.5
Nebraska	0.5	0	0	0	0	0	0	0	0.5
Alabama	0	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0	0
West Virginia	0	0	0	0	–1	0	0	0	–1

DISCUSSION

History of Utility and Public Benefits Programs and Policies

The structure and delivery of customer-funded electric energy efficiency programs have changed dramatically over the past three decades, mostly in conjunction with electric industry restructuring efforts.[22] In the 1980s and 1990s, such programs were almost exclusively the domain of utilities, but efforts in the mid-1990s to restructure and deregulate the electric utilities led numerous states to implement public benefits charges as a new source of funding for efficiency. These public benefits approaches established new structures under which utilities—or, in some states, separate efficiency utilities or other third parties—were tasked with administering and delivering energy efficiency, renewable energy, and low-income programs.[23]

Despite such public benefits programs, restructuring still resulted in a precipitous decline in funding for energy efficiency programs in the late 1990s, primarily due to regulatory uncertainty and the expected loss of cost-recovery mechanisms for those programs.[24] Generally, utilities did not see customer-funded energy efficiency programs as being compatible with competitive retail markets.

After restructuring efforts slowed in some states, utility commissions renewed their focus on energy efficiency programs. From their low point in 1998, annual investments in electricity programs had increased more than fourfold by 2010, from approximately $900 million to $3.9 billion. However, growth in efficiency investments has slowed in recent years. In 2019 total spending for electric efficiency increased about 2.9% to $6.84 billion. Adding natural gas program spending of $1.53 billion, we estimate total efficiency program spending of approximately $8.37 billion in 2019 (see figure 2), an increase of about 3.8% compared with 2018.

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[22] By *customer-funded energy efficiency programs*—also known as *ratepayer-funded energy efficiency programs*—we mean energy efficiency programs funded through charges wrapped into customer rates or appearing as some type of fee on customer utility bills. This includes both utility-administered programs and public benefits programs administered by other entities. We do not include data on separately funded low-income programs, load management programs, or energy efficiency R&D.

[23] States that have established nonutility administration of efficiency programs include Delaware, District of Columbia, Hawaii, Maine, New Jersey, New York, Oregon, Vermont, and Wisconsin.

[24] Under traditional regulatory structures, utilities do not have an economic incentive to help their customers become more energy efficient because their revenues and profits decline in line with falling energy sales resulting from energy efficiency programs. To address this disincentive, state regulators allow utilities to recover, at a minimum, the costs of running energy efficiency programs through charges on customer bills. For more on this issue, see York and Kushler (2011).

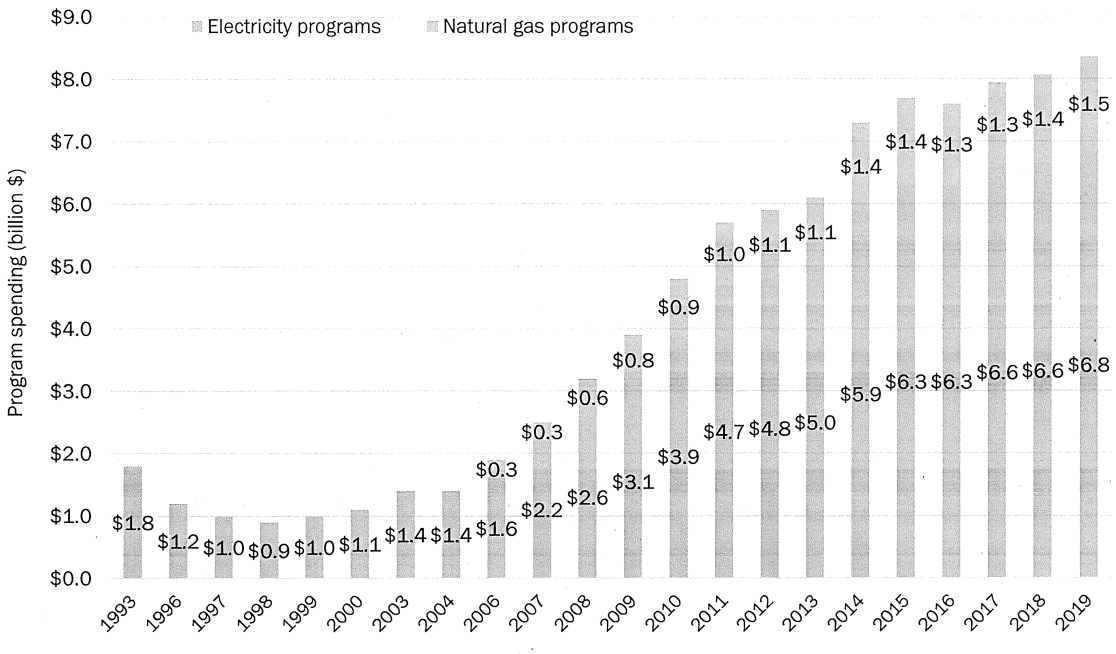

Figure 2. Annual electric and natural gas energy efficiency program spending. Natural gas spending is not available for the years 1993–2004. *Sources:* Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; CEE 2012, 2013, 2014, 2015, 2016, 2017, 2018; Gilleo et al. 2015b; Berg et al. 2016, 2017, 2018, 2019.

Nationwide reported savings from utility and public benefits electricity programs in 2019 totaled 0.70% of sales, or 26.9 million MWh, a 0.75% decrease from 2018. However, the total annual impact of efficiency programs continues to grow, since most efficiency measures generate savings for residents and businesses for years after they are installed. As figure 3 shows, the total impact of ratepayer-funded energy efficiency programs was a savings of almost 273 million MWh in 2019: the 26.9 million MWh of incremental savings plus savings still accruing from measures implemented in prior years.[25] These large-scale savings are equivalent to approximately 7.07% of 2019 electricity consumption.

[25] Based on annual *State Scorecard* data as cited in figure 2. Assumes an average measure life of 10 years.

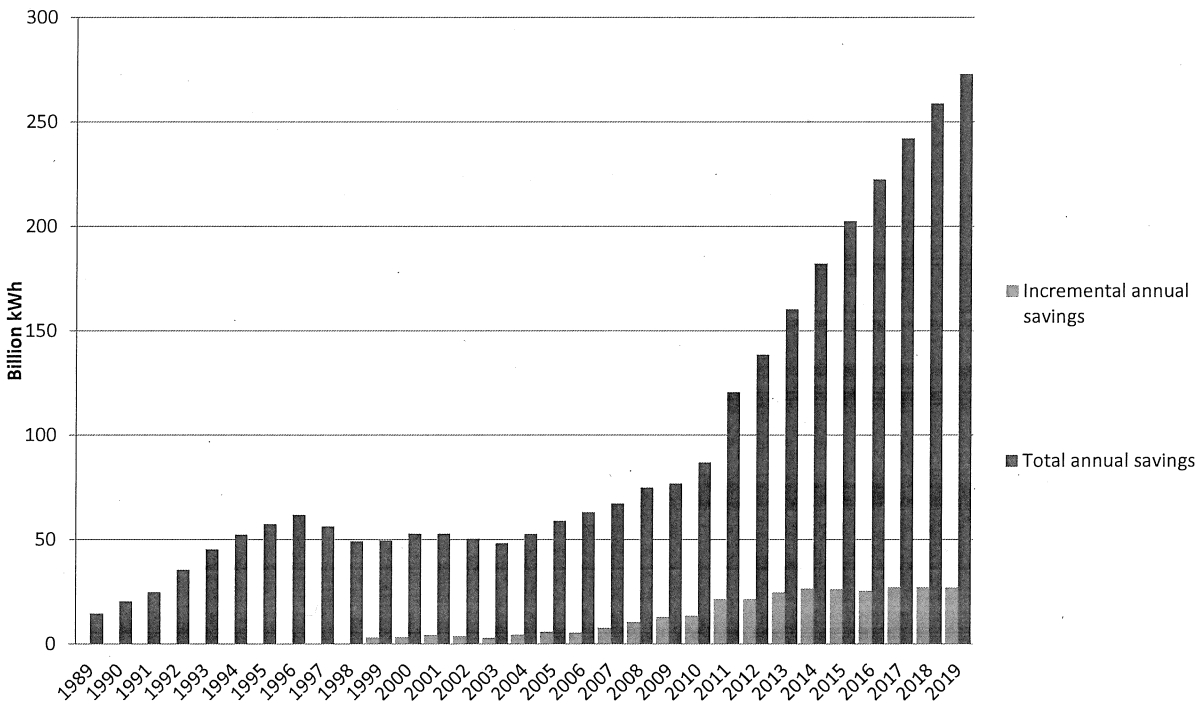

Figure 3. Electric savings from utility-sector energy efficiency programs, by year

Regional Highlights from State Utility Policies and Programs

Though COVID-19 hampered efforts in many states to enact clean energy rules and legislation, there remained numerous examples of important utility reforms advanced or achieved by lawmakers and regulators amid the pandemic.

NORTHEAST

Home to many of the *Scorecard*'s leading states, the Northeast continued to see progress in advancing efficiency in the utility sector. In New Jersey, following months of work by stakeholders, the utilities commission, and staff, the Board of Public Utilities produced an order in June setting ambitious goals to ramp up annual savings to 2.15% of electric use and 1.1% of gas use; these exceed even the respective 2% and 0.75% electric and gas goals initially called for in the state's 2018 Clean Energy Act. The order also transitions the utilities to a more central role in program delivery, establishes a performance-based recovery mechanism to encourage utilities to maximize customer savings, and strengthens stakeholder engagement processes with an added focus on equity and workforce development, all signaling a new era for efficiency in New Jersey.

In January the New York Public Service Commission also issued a major new efficiency order. It calls for the achievement of 185 TBtus of savings by 2025 per the state's Climate Leadership and Community Protection Act (CLCPA), translating to nation-leading annual goals of 3% electric savings and 1.3% natural gas savings. The order also includes a 3.6 TBtu carve-out target for savings from heat pumps, alongside a $454 million combined budget with $30

million set aside for low-to-moderate-income heat pump adoption. Shortly afterward, Con Edison announced a $1.5 billion initiative tripling efficiency investments in 2025 with a focus on heat pump deployment.

There is a growing movement among a number of states to better integrate fuel switching and electrification within efficiency portfolios, and Massachusetts continued to pursue policy designs at the leading edge of this trend. In the Bay State these efforts have been spurred in part by 2018 legislation redefining energy efficiency to include strategic electrification, aligning with the state's decarbonization goals. The current 2019–2021 efficiency plan now reflects a more holistic approach to measuring overall energy use, including an all-fuel efficiency savings metric in MMBtu with a focus on fuel switching. In March 2020, a study was completed to refine the methodology for calculating all-fuel energy savings; this will likely be further reviewed as part of the 2022–2024 planning process (Molina et al. 2020). Later in the year, the state also instituted a first-of-its-kind Clean Peak Energy Standard that provides incentives to promote the use of clean energy during periods of peak electricity demand.

MIDWEST

As across much of the United States, legislative sessions in the Midwest convened on a limited basis during 2020. While lawmakers in Illinois and Minnesota sought to advance significant clean energy bills early in the year, these efforts stalled amid competing legislative priorities, though efforts are ongoing for revival in future sessions. These included proposed bills in Minnesota that would transition the state to carbon-free electricity by 2050, raise efficiency targets, and expand efficiency portfolios to allow the inclusion of beneficial electrification and load management measures. Similarly, in Illinois, the proposed Clean Energy Jobs Act would greatly expand efficiency programs and standards across the state and set a strengthened goal of 100% renewable energy by 2050. Though the bill was not called to a vote in earlier legislative sessions, in August the governor announced plans to restart working group discussions with an eye toward potentially adopting the legislation later in the year.

Promising efforts were also underway in Michigan, where the governor and Public Service Commission launched MI Power Grid in October 2019. The multiyear stakeholder initiative will undertake work on new technologies, pilots, and utility businesses models in order to optimize the transition to a clean energy grid (State of Michigan 2019). In addition, state energy reforms passed in 2016 continue to push Michigan's regulated utilities to strengthen long-term planning, with an emphasis on clean energy and efficiency. Both major utilities, Consumers Energy and DTE, recently adopted integrated resource plans scaling up efficiency savings to 2% of annual electricity sales by 2021, far exceeding the 1% minimum statutory savings goals.

SOUTHEAST

A major victory for efficiency in the Southeast came out of Virginia this year, where lawmakers passed the Virginia Clean Economy Act. In addition to putting the state on a path to 100% clean electricity, the bill establishes the state's first-ever energy efficiency resource standard, making it one of only two states in the region, alongside Arkansas, with a mandatory EERS. Virginia's EERS stipulates that by 2025, Dominion must achieve at least 5% energy efficiency savings and that Appalachian Power Company must reach 2% savings. This

translates to an average statewide incremental annual goal of 1.2% savings each year. The bill also sets up a process to strengthen the EERS after 2025, with the State Corporation Commission adjusting savings targets every three years thereafter. Importantly, utilities will have to prove they are achieving those targets before they are permitted to build new fossil fuel plants.

While state commitments to ramp up clean energy have been less of a priority across the rest of the Southeast region, some utilities, such as Dominion Energy, Duke Energy, and Southern Company, have stepped up recently to announce net-zero carbon emissions goals to be achieved by midcentury. These pledges, while a positive sign, will need to be matched by tangible long-term resource planning decisions that phase out fossil fuels and shift toward renewable sources in the very near future. In September Duke filed its integrated resource plan (IRP) for the next 15 years in the Carolinas. It shows a promising increased emphasis on efficiency as part of its pathway to net zero, although much uncertainty remains (Duke Energy 2020).

WEST

In a year of record-breaking wildfires, California's 100% zero-carbon electricity goals took on added urgency as regulators looked for ways to accelerate action. In late 2019, months after the state PUC's issuance of updated 10-year utility savings targets, the California Energy Commission released its *2019 California Energy Efficiency Action Plan*, charting progress toward statewide SB 350 goals to double efficiency by 2030 (Kenney, Bird, and Rosales 2019). While the CEC currently anticipates a shortfall in meeting ambitious 2030 targets due to a variety of factors, it also makes supplemental recommendations for increasing program participation and stimulating new market activity. These recommendations include expanding funding beyond ratepayer portfolios, strengthening collection and sharing of energy data, and better understanding and incorporating demand flexibility into building and appliance standards, to name just a few.

In Colorado, following a wave of important clean energy legislation signed in 2019—including a 90% economy-wide GHG reduction goal—the state PUC got to work on related legislated calls to reform utility distribution system planning and business models. These efforts have included an investigation into a performance-based regulation (PBR) model to potentially include performance metrics and corresponding financial incentives aligned with public benefits goals like safety, cost efficiency, and emissions reductions (Colorado Energy Office 2019). The PUC plans to submit a report on its findings and recommendations to the legislature in November 2020.

Other states pursuing new PBR frameworks to better align utility investments with state energy goals include Hawaii and Nevada. The Hawaii PUC concluded Phase 1 of its PBR proceeding in 2019 by issuing an order establishing a new utility regulatory framework; Phase 2, focusing on development of revenue adjustment mechanisms and performance incentives, is expected to produce a PUC order by the end of 2020 (Hawaii PUC 2019). Similarly, Nevada took important steps to implement SB 300, signed in 2019, which requires the utilities commission to adopt regulations enabling utilities to seek approval of alternative ratemaking plans intended to promote renewable energy, energy efficiency, and other flexible grid resources. During the summer the commission issued a series of concept papers building

toward a framework for development of goals and outcomes and outlining future work to be undertaken by stakeholders (State of Nevada Public Utilities Commission 2020).

In Arizona, the state Corporation Commission (ACC) laid the groundwork this year for a new clean energy future with a 4–1 vote approving a 100% carbon-free electricity standard. It was also a pivotal year for energy efficiency, with the ACC approving a new demand-side management (DSM) plan for the Arizona Public Service Company (APS) that restores funding for a number of energy efficiency programs. In addition, the new carbon-free standard approved in November includes an important extension and expansion of the state's existing EERS—which was scheduled to expire this year—ushering in a new era of utility energy savings programs. The vote kicks off a rulemaking and hearing process and will require a final vote by the new commission next year. The coming months will be critical as the utilities and regulators determine which direction to take in the next iteration of efficiency programs.

Savings from Electricity and Natural Gas Efficiency Programs

We assess the overall performance of electricity and natural gas energy efficiency programs by the amount of energy saved. Utilities and nonutility program administrators pursue numerous strategies to achieve energy efficiency savings. Program portfolios may initially concentrate on the most cost-effective and easily accessible measure types, such as energy-efficient lighting and appliances. As utilities gain experience, as technologies mature, and as customers become aware of the benefits of energy efficiency, the number of approaches increases. Utilities estimate program energy savings, which are then subject to internal or third-party evaluation, measurement, and verification (EM&V) and are typically reported to the public utility commission on a semiannual or annual basis.

In states ramping up funding in response to aggressive EERS policies, programs typically shift focus from widget-based approaches (e.g., installing new, more efficient water heaters) to comprehensive deep-savings strategies that seek to generate greater energy efficiency savings per program participant by conducting whole-building or system retrofits. Some deep-savings approaches also draw on complementary efficiency efforts, such as utility support for full implementation of building energy codes (Nowak et al. 2011; Misuriello et al. 2012). Deep-savings approaches may also promote grid-interactive efficient buildings (GEBs) and comprehensive changes in systems and operations by including behavioral elements that empower customers.

We should note that while we consider electric and natural gas savings separately for the purposes of this report, our research has found that a handful of states—particularly those with aggressive clean energy and GHG reduction goals—have begun considering savings on a combined fuel-neutral basis. Such an approach allows states the flexibility to better account for savings from resources with competing profiles. For instance, switching homes from fossil fuel heating to electric air-source heat pumps may increase electric demand, but it will also reduce overall energy use on a total Btu basis and lower GHG emissions in regions with a relatively high penetration of renewable energy resources. This approach to accounting is still in its infancy, but as more states prioritize beneficial electrification as a decarbonization

strategy, we expect to see this practice become more commonplace and will adjust our *Scorecard* methodology as appropriate.[26]

SCORES FOR INCREMENTAL SAVINGS IN 2019 FROM ELECTRIC EFFICIENCY PROGRAMS

We report 2019 statewide net energy efficiency savings as a percentage of 2018 retail electricity sales, scoring the states on a scale of 0 to 7. We relied primarily on states to provide these data. Thirty-five states and the District of Columbia completed some or all of our data request form. Where no data for 2019 were available, we used the most recent savings data obtainable, either state-reported 2018 savings from the *2019 State Scorecard* or information from the EIA (2020b).

As we have since 2015, we awarded full points to states that achieved savings of at least 2% of electricity sales. We continue to see examples of states exceeding the 2% mark. Table 7 lists the scoring for each level of savings.

Table 7. Scoring of utility and public benefits electricity savings

2019 savings as % of sales	Score
2% or greater	7
1.86–1.99%	6.5
1.72–1.85%	6
1.58–1.71%	5.5
1.44–1.57%	5
1.30–1.43%	4.5
1.16–1.29%	4
1.02–1.15%	3.5
0.88–1.01%	3
0.74–0.87%	2.5
0.60–0.73%	2
0.46–0.59%	1.5
0.32–0.45%	1
0.18–0.31%	0.5
Less than 0.18%	0

Table 8 shows state results and scores. Nationwide reported savings from utility and public benefits electricity programs in 2019 totaled 26.92 million MWh, equivalent to 0.70% of sales.

[26] Among the states currently measuring savings on a total MMBtu basis are Massachusetts, Wisconsin, and New York, although no states have yet to abandon fuel-specific electric and natural gas goals for an exclusively fuel-neutral goal.

This is approximately 0.8% less than the 27.13 million MWh (0.73% of sales) reported last year.

Table 8. 2019 net incremental electricity savings by state

State	2019 net incremental savings (MWh)	% of 2018 retail sales	Score (7 pts.)
Rhode Island	190,159	2.51%	7
Massachusetts	1,199,409	2.25%	7
Maryland	1,327,930	2.14%	7
Vermont	117,289	2.12%	7
California†	4,447,063	1.74%	6
Illinois	2,061,135	1.44%	5
Michigan	1,474,105	1.41%	4.5
New York	1,939,971	1.29%	4
District of Columbia	139,560	1.23%	4
Connecticut	349,772	1.21%	4
Hawaii†	110,774	1.19%	4
Minnesota†	729,734	1.06%	3.5
Oregon†	523,590	1.06%	3.5
Maine†	127,786	1.03%	3.5
Washington†*	880,976	0.98%	3
Arizona†*	763,855	0.97%	3
Colorado†‡	535,056	0.95%	3
Ohio†*	1,447,594	0.95%	3
New Hampshire†*	103,111	0.93%	3
Idaho†	210,216	0.88%	3
Nevada†	277,469	0.73%	2
Pennsylvania	1,068,377	0.72%	2
Iowa†‡	360,095	0.70%	2
Utah	201,850	0.65%	2
North Carolina	890,940	0.64%	2
Wisconsin	455,118	0.64%	2
Missouri†*	515,242	0.63%	2
Arkansas	311,006	0.63%	2
Indiana†*	650,482	0.62%	2
New Jersey†	469,560	0.62%	2
New Mexico	134,209	0.56%	1.5
Montana†	82,161	0.55%	1.5
South Carolina†*	426,283	0.52%	1.5
Oklahoma*	288,417	0.45%	1
Nebraska†‡	74,428	0.24%	0.5
South Dakota†	30,359	0.24%	0.5
Georgia†	322,918	0.23%	0.5
Wyoming†	38,484	0.23%	0.5
Texas†	826,884	0.19%	0.5
Delaware	22,447	0.19%	0.5
Kentucky†*	135,912	0.18%	0.5
Mississippi	79,460	0.16%	0
West Virginia	52,221	0.16%	0
Louisiana†‡	118,281	0.13%	0
Virginia†*	133,322	0.11%	0
Florida†	251,346	0.11%	0
Tennessee	16,727	0.02%	0
North Dakota†	3,002	0.01%	0
Alabama†*	8,647	0.01%	0
Alaska†*	247	0.00%	0
Kansas†*	265	0.00%	0
U.S. total	**26,925,246**	**0.70%**	
Median	**277,469**	**0.64%**	

Savings data are from public service commission staff as listed in Appendix A, unless noted otherwise. Sales data are from EIA Form 861 (2020b).
* For states where we were unable to obtain savings data from commission staff, we relied on 2019 adjusted gross savings data from EIA-861 (2020). † At least a portion of savings were reported as gross. We adjusted the gross portion by a net-to-gross factor of 0.825 to make it comparable to net savings figures reported by other states. ‡ Includes both state-reported IOU data and some portion of EIA-reported savings for municipal utilities and co-ops.

States use different methodologies for estimating energy savings, and this can produce inequities when making comparisons (Sciortino et al. 2011). A state's EM&V process plays a key role in determining how savings are quantified. This is particularly true of a state's treatment of free ridership (savings attributed to a program that would have occurred even in the absence of the program) and spillover (savings *not* attributed to a program that would *not* have occurred without it). States report energy savings as either net or gross, with net savings accounting for free riders and free drivers, and gross savings not accounting for these.[27] The *State Scorecard* specifically focuses on net savings.

In a national survey of evaluation practices, ACEEE researchers found that, of the 42 states responding, 8 reported gross savings, 16 reported net, and 18 reported both (York, Cohn, Kushler 2020). This finding points to several important caveats regarding the electric program savings data. A number of states do not estimate or report net savings. In these cases, we applied a standard factor of 0.825 to convert gross savings to net savings (a net-to-gross ratio).[28] Doing so allows a more straightforward comparison with states that report net electricity savings. It also should be noted that different states and utilities may define net savings in different ways and adopt different calculation methods.

SCORES FOR INCREMENTAL SAVINGS IN 2019 FROM NATURAL GAS AND UNREGULATED FUELS EFFICIENCY PROGRAMS

Utilities are increasing the number and size of natural gas programs in their portfolios. However, data on savings resulting from these programs are still limited. In this category we awarded points to states that were able to track savings from their natural gas and unregulated fuels efficiency programs and realized savings of at least 0.17% of sales in the residential and commercial sectors. We relied on data from state utility commissions. Table 9 lists scoring criteria for natural gas and unregulated fuels program savings. We awarded a maximum of 3 points to states reporting savings of at least 1.00% of sales.

Consistent with the methodology we adopted in 2018 for tracking heating fuel efficiency, we combined natural gas data with data for consumption and savings associated with the most widely used unregulated fuels into a single thermal fuels energy savings metric. This approach is a consistent way to measure energy efficiency efforts and performance across states with different fuel mixes and policies. Previously, direct comparison of natural gas savings as a percentage of sales across states was complicated by the varying percentage of customers with access to natural gas, incomplete data on unregulated fuels, and varying levels of energy efficiency program funding based on regulated energy sources. These issues are most common in the Northeast, where some states have a larger share of residential and commercial customers using fuel oil and other unregulated fuels for heating.

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[27] Free drivers are utility customers who install energy efficiency measures as a result of a program but are not themselves participants in the energy efficiency program.

[28] We based the 0.825 net-to-gross factor used this year on the median net-to-gross ratio calculated from those jurisdictions that reported figures for both net and gross savings in this year's data request. These were Colorado, Connecticut, Delaware, District of Columbia, Illinois, Maryland, Missouri, Montana, Nevada, New York, North Carolina, Pennsylvania, Oklahoma, Oregon, Tennessee, Utah, West Virginia, and Wisconsin. We applied this conversion factor to all states reporting only gross savings. We determined savings to be gross on the basis of responses to our survey of public utility commissions.

To integrate unregulated fuels, we collected 2019 savings data on fuel oil, kerosene, propane, and wood from public service commissions and added these to the natural gas savings reported for each state. Similarly, we obtained consumption data by state for each fuel type from the EIA and combined this with natural gas energy sales for residential and commercial customers. We converted all energy units to MMBtus and divided savings by sales to create the common metric.

Table 9. Scoring of natural gas and unregulated fuel program savings

Savings as % of sales	Score
1.00% or greater	3
0.84–0.99%	2.5
0.67–0.83%	2.0
0.50–0.66%	1.5
0.34–0.49%	1
0.17–0.33%	0.5
Less than 0.17%	0

Table 10 shows states' scores for natural gas and unregulated fuel program savings.[29]

[29] As we did with electric savings, we applied a net-to-gross (NTG) factor to all states reporting only gross natural gas savings. In this case, the NTG factor was 0.846 based on states that reported figures for both net and gross natural gas savings in this year's data request. These were Connecticut, Delaware, District of Columbia, Maryland, Massachusetts, Montana, Oklahoma, Oregon, Pennsylvania, and Wisconsin.

Table 10. State scores for 2019 natural gas and fuel efficiency program savings

State	2019 net incremental fuel savings (MMBtu)*	% of commercial and residential retail sales**	Score (3 pts.)
California	8,330,145	1.05%	3
Massachusetts†	3,364,493	0.91%	2.5
Rhode Island†	503,186	0.91%	2.5
Michigan	5,731,629	0.90%	2.5
Minnesota	2,832,660	0.84%	2.5
Utah	960,000	0.76%	2
District of Columbia	239,000	0.72%	2
Hawaii**	—	—	2
Illinois	4,330,000	0.58%	1.5
Wisconsin	1,829,486	0.55%	1.5
New York†	5,725,989	0.53%	1.5
Oregon	590,418	0.51%	1.5
Arkansas	560,000	0.50%	1.5
Arizona*	344,501	0.40%	1
Colorado	849,314	0.38%	1
Connecticut†	701,650	0.35%	1
Vermont†	195,036	0.34%	1
Maryland	686,791	0.33%	0.5
New Hampshire†*	255,487	0.30%	0.5
Maine†	297,040	0.30%	0.5
Iowa	477,761	0.28%	0.5
Oklahoma	370,000	0.27%	0.5
Delaware	98,788	0.27%	0.5
Indiana*	718,893	0.26%	0.5
Washington*	507,600	0.25%	0.5
New Jersey	1,137,484	0.24%	0.5
Mississippi	110,868	0.19%	0.5
New Mexico	150,000	0.18%	0.5
North Carolina	160,000	0.08%	0
Idaho	44,900	0.06%	0
South Dakota	22,830	0.06%	0
Florida	64,947	0.06%	0
Montana	43,708	0.06%	0
Pennsylvania	226,060	0.04%	0
Alabama	—	0.00%	0
Alaska	—	0.00%	0
Georgia	—	0.00%	0
Kansas	—	0.00%	0
Kentucky	—	0.00%	0
Louisiana	—	0.00%	0
Missouri	—	0.00%	0
Nebraska	—	0.00%	0
Nevada	—	0.00%	0
North Dakota	—	0.00%	0
Ohio	—	0.00%	0
South Carolina	—	0.00%	0
Tennessee	—	0.00%	0
Texas	—	0.00%	0
Virginia	—	0.00%	0
West Virginia	—	0.00%	0
Wyoming	—	0.00%	0
U.S. total	**42,460,661**	**0.38%**	
Median	**160,000**	**0.19%**	

Savings data were reported by contacts at public utility commissions as listed in Appendix A, unless otherwise noted. All sales data are from EIA Form 176 (EIA 2020d) and EIA's State Energy Data System (SEDS) (EIA 2019e). * States for which we did not have 2019 savings data were scored on 2018 state-reported savings. ** Hawaii uses very limited natural gas and therefore earned points commensurate with its electric efficiency savings scores. † At least a portion of natural gas savings were reported as gross; we adjusted the gross portion by a net-to-gross factor of 0.846 to make it comparable to net savings figures reported by other states. ‡ These states reported some level of unregulated fuel savings.

Electricity and Natural Gas Efficiency Program Funding

In this category, we scored states on 2019 electricity and natural gas efficiency program spending for customer-funded energy efficiency programs. These programs are funded through charges included on utility customers' bills.[30] Our data include spending by investor-owned, municipal, and cooperative utilities; public power companies or authorities; and public benefits program administrators. We did not collect data on federal grant allocations received by states through DOE's Weatherization Assistance Program. We did include revenues from the Regional Greenhouse Gas Initiative (RGGI), which contributes to customer-funded energy efficiency program portfolios of member states and to energy efficiency programs funded through AB 32 and Proposition 39 in California.[31] Where RGGI funds were channeled to energy efficiency initiatives implemented by state governments, we included them in Chapter 6, "State Government–Led Initiatives."

For states that did not provide data for 2019 spending on energy efficiency programs for electric or natural gas utilities, we used expenditure data from EIA-861 or information supplied by our state contacts in their 2018 utility data request responses.

Spending data are subject to variation across states, and this poses an ongoing challenge to our efforts to equitably score states based on a common and reliable metric. Several states report performance incentives paid to utilities or other program administrators as part of utility efficiency program spending, resulting in higher spending numbers. While most performance incentives are based on shared net benefits—viewed as an expense—the relative amounts of the incentives are in the range of 5–15% of program spending (Nowak et al. 2015). For this reason, we asked states to disaggregate program spending from these incentives. We did not credit this spending in our scoring in an effort to more accurately reflect funds directly dedicated to energy efficiency measures. As in past years, we sent spending data gathered from the above sources to state utility commissions for review. Tables 12 and 14 below report electricity and natural gas efficiency program spending, respectively.

SCORES FOR ELECTRIC PROGRAM SPENDING

States could receive up to 2.5 points for their energy efficiency spending as a percentage of 2018 electric utility revenues, with the threshold for the maximum achievable points set at 5.0% of revenues.[32] For every 1.05 percentage points less than 5%, a state's score decreased by 0.5 points. Table 11 lists the scoring bins for each spending level.

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[30] Some of these programs target unregulated fuels or are fuel-blind to household heating sources. Spending for this type of program is typically captured in our electric efficiency spending metric.

[31] AB 32 is California's GHG reduction bill that resulted in a cap-and-trade program. Proposition 39 grants significant funding to energy efficiency programs targeting schools. Both programs are subject to evaluation, measurement, and verification at least as stringent as the EM&V for utility programs.

[32] Statewide revenues are from EIA Form 861 (EIA 2020b). We measure spending as a percentage of revenues to normalize the level of energy efficiency spending. Blending utility revenues from all customer classes gives a more accurate measure of utilities' overall spending on energy efficiency than does expressing budgets per capita, which might skew the data for utilities that have a few very large customers. Statewide electric energy efficiency spending per capita is presented in Appendix B.

Table 11. Scoring of electric efficiency program spending

2019 spending as % of revenues	Score
5.00% or greater	2.5
3.95–4.99%	2
2.90–3.94%	1.5
1.85–2.89%	1
0.80–1.84%	0.5
Less than 0.80%	0

Table 12 shows state-by-state results and scores for this category.

Table 12. 2019 electric efficiency program spending by state

State	2019 elec. spending ($ million)	% of statewide elec. revenues	Score (2.5 pts.)
Rhode Island	104.1	7.58%	2.5
Vermont	55.2	6.59%	2.5
Massachusetts	620.4	6.29%	2.5
Maryland	275.6	3.84%	1.5
Oregon	161.5	3.70%	1.5
California	1516.4	3.58%	1.5
Illinois	433.8	3.17%	1.5
Idaho	61.4	3.16%	1.5
Connecticut	161.4	3.04%	1.5
New York	645.2	2.90%	1.5
Maine	45.9	2.76%	1
Washington*	190.7	2.65%	1
New Hampshire*	48.6	2.59%	1
Minnesota	157.0	2.20%	1
Michigan	250.7	2.10%	1
Colorado	108.0	1.91%	1
Utah	47.1	1.84%	0.5
Arkansas	68.0	1.76%	0.5
Iowa*	75.6	1.65%	0.5
Hawaii	42.0	1.54%	0.5
Delaware	17.9	1.44%	0.5
New Mexico	31.7	1.41%	0.5
Nevada	45.3	1.38%	0.5
Oklahoma	68.6	1.31%	0.5
Pennsylvania	197.5	1.31%	0.5
New Jersey	123.0	1.22%	0.5
Ohio*	175.0	1.15%	0.5
North Carolina	145.8	1.14%	0.5
District of Columbia	15.4	1.13%	0.5
Montana	14.4	1.09%	0.5
Indiana*	107.3	1.06%	0.5
Missouri	85.8	1.05%	0.5
Wisconsin	79.0	1.05%	0.5
Arizona*	86.2	1.01%	0.5
South Carolina*	64.0	0.81%	0.5
Wyoming	10.2	0.75%	0
Texas	196.2	0.55%	0
Florida	105.4	0.43%	0
Georgia	57.0	0.42%	0
Kentucky*	27.2	0.42%	0
Mississippi	17.1	0.37%	0
South Dakota	4.7	0.37%	0
Louisiana	24.6	0.34%	0
Virginia*	31.7	0.28%	0
West Virginia	7.6	0.26%	0
Nebraska	7.1	0.25%	0
Tennessee	19.2	0.19%	0
Alabama*	7.7	0.09%	0
North Dakota*	0.2	0.01%	0
Kansas*	0.3	0.01%	0
Alaska*	0.0	0.00%	0
U.S. total	**6,841.6**	**1.68%**	
Median	**64.0**	**1.22%**	

2018 statewide revenues are from EIA Form 861 (EIA 2020b). Spending data are from public service commission staff as listed in Appendix A.
* Where 2019 spending was not available from states, we substituted 2019 spending as reported by EIA-861 (EIA 2020d).

SCORES FOR NATURAL GAS PROGRAM SPENDING

We scored states on natural gas efficiency program spending by awarding up to 1.5 points based on 2019 program spending data gathered from a survey of state utility commissions and independent statewide administrators. To directly compare spending data among the states, we normalized spending by the number of residential natural gas customers in each state in 2018, as reported by EIA (2020e).[33] Table 13 shows scoring bins for natural gas program spending. As in last year's *State Scorecard*, states posting spending of at least $50 per customer were awarded the maximum number of points.

Table 13. Scoring of natural gas utility and public benefits spending

2019 gas spending per customer	Score
$50 or greater	1.5
$27.50–49.99	1
$5.00–27.49	0.5
Less than $5.00	0

After a significant uptick in 2014, natural gas program spending levels have remained relatively flat in recent years. In 2019, spending totaled $1.5 billion, comparable to 2018 levels. Natural gas efficiency spending remains significantly lower than spending for electricity energy efficiency programs. Table 14 shows states' scores.

[33] We used spending per residential customer for natural gas because reliable natural gas revenue data are sparse, and use of per capita data unfairly penalizes states that offer natural gas service to only a portion of their population (such as Vermont). State data on the number of residential customers are from EIA (2020e).

Table 14. 2019 natural gas efficiency program spending by state

State	2019 gas spending ($ million)	$ per 2018 residential customer	Score (1.5 pts.)
Massachusetts	279.5	$182.35	1.5
Rhode Island	30.1	$123.59	1.5
Connecticut	44.9	$80.58	1.5
New Hampshire*	7.9	$73.20	1.5
Vermont	3.1	$66.85	1.5
Minnesota	65.7	$42.56	1
New York	177.4	$39.22	1
Oregon	28.7	$38.14	1
Maine	1.3	$37.28	1
Florida	26.7	$35.14	1
California	385.5	$34.96	1
Delaware	6.0	$33.87	1
New Jersey	89.5	$31.77	1
Michigan	96.0	$29.12	1
Arkansas	14.7	$26.51	0.5
Utah	23.6	$24.83	0.5
District of Columbia	3.8	$24.72	0.5
Washington*	27.3	$22.86	0.5
Iowa	20.1	$21.59	0.5
Illinois	75.9	$19.34	0.5
Oklahoma	16.6	$17.54	0.5
Wisconsin	20.0	$11.27	0.5
Colorado	20.0	$11.23	0.5
Idaho	4.3	$10.65	0.5
New Mexico	6.0	$10.12	0.5
Montana	2.4	$8.62	0.5
Indiana*	13.6	$7.77	0.5
Maryland	7.7	$6.67	0.5
Mississippi	2.3	$5.06	0.5
Arizona*	5.5	$4.35	0
Pennsylvania	11.4	$4.06	0
South Dakota	0.8	$4.04	0
Missouri	5.6	$3.97	0
North Carolina	2.0	$1.56	0
Nevada	1.2	$1.38	0
Alabama	0.0	$0.00	0
Alaska	0.0	$0.00	0
Georgia	0.0	$0.00	0
Hawaii**	0.0	$0.00	0.5
Kansas	0.0	$0.00	0
Kentucky	0.0	$0.00	0
Louisiana	0.0	$0.00	0
Nebraska	0.0	$0.00	0
North Dakota	0.0	$0.00	0
Ohio	0.0	$0.00	0
South Carolina	0.0	$0.00	0
Tennessee	0.0	$0.00	0
Texas	0.0	$0.00	0
Virginia	0.0	$0.00	0
West Virginia	0.0	$0.00	0
Wyoming	0.0	$0.00	0
U.S. total	**1,526.8**		
Median	**5.5**		

Spending data are from public service commission staff as listed in Appendix A, unless noted otherwise. * Where 2019 spending data were not available, we substituted 2018 spending as reported by public service commission staff. ** Hawaii was awarded points commensurate with points received for electricity spending.

Opt-Out Provisions for Large Customers

As we have since the *2014 State Scorecard*, we provide an assessment of opt-out and self-direct provisions for large customers. In many cases large customers seek to opt out of utility energy efficiency programs, asserting that they have already captured all the energy efficiency that is cost effective. However, this is seldom the case (Chittum 2011). Opt-out differs from self-direct in that customers who opt out do not have to pay into energy efficiency funds at all; self-direct allows some customers to spend their efficiency fees internally, within their own business operations. Some state policies go beyond opt-out to fully exempt customers from participating in utility energy efficiency programs. In these cases, the customers are excluded and may not opt in.

Opt-out and exemption policies have several negative consequences. Failure to include large-customer programs in an energy efficiency portfolio increases the cost of energy savings for all customers and reduces the benefits (Baatz, Relf, and Kelly 2017). In effect, allowing large customers to opt out forces other consumers to indirectly subsidize them: Those who have opted out share some of the system benefits, but only the smaller customers are paying to support energy efficiency programs. It also prevents utilities from capturing all highly cost-effective energy savings; this can contribute to higher overall system costs through the use of more expensive supply resources. While the ideal solution is for utilities to offer programs that respond to the needs of these large consumers, ACEEE's research suggests that this does not always happen (Chittum 2011). When it does not, we suggest giving these customers the option of self-directing their energy efficiency program dollars.[34] This option provides a path for including large-customer energy efficiency in the state's portfolio of savings. We provide examples of self-direct programs in Appendix C.

SCORES FOR LARGE-CUSTOMER OPT-OUT PROVISIONS

We include opt-out as a category in which states may lose rather than gain points. We subtracted 1 point for states that allow electric or natural gas customers, or both, to opt out of energy efficiency programs.[35]

We did not subtract points for self-direct programs. When implemented properly, these programs can effectively meet the needs of large customers. Self-direct programs vary from state to state, with some requiring more stringent measurement and verification of energy savings than others (Chittum 2011). In the future, we may examine these programs with a more critical eye and subtract points from states that lack strong evaluation and measurement. Table 15 shows states with opt-out programs.

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[34] Self-direct programs allow some customers, usually large industrial or commercial ones, to channel energy efficiency fees usually paid on utility bills directly into energy efficiency investments in their own facilities instead of into a broader, aggregated pool of funds. These programs should be designed to include comparable methods to verify and measure investments and energy savings. For more information, see aceee.org/sector/state-policy/toolkit/industrial-self-direct.

[35] By default, most large gas customers already are opted out because they take wholesale delivery (frequently directly from transmission) and are thus outside the purview of state government. We did not subtract points in these cases.

Table 15. States allowing large customers to opt out of energy efficiency programs

State	Opt-out description	Score
Arkansas	Under Act 253, passed in 2013, customers with more than 1 MW or 70,000 MMBtu in monthly demand may opt out. Large manufacturers that file under Act 253 do not have to offer documentation of planned or achieved savings. However, large commercial and industrial (C&I) customers not meeting the definition of manufacturing and customers that have filed under Section 11 of the state's Rules for Conservation and Energy Efficiency Programs must file an application showing how savings have been or will be achieved. More than 50 large customers have opted out, constituting a significant share of overall sales that varies by utility. In 2017, HB 1421 added state-supported higher-education institutions to the list of customers eligible to opt out.	-1
Illinois	Illinois specifically exempts large customers under recent electric savings targets passed in SB 2814. These exemptions remove an estimated 10% of ComEd's and 25% of Ameren's load from programs. The exemption weakens participation even more than an opt-out policy in that these electric utility customers cannot participate in programs even if they wish to. Under 220 ILCS 5 8-104(m) there was also a self-direct/opt-out for certain large natural gas customers. However, this sunsets in 2020 per 220 ILCS 5 8-104(n).	-1
Indiana	Opt-out applies to the five investor-owned electric utilities. Eligible customers are those that operate a single site with at least one meter constituting more than 1 MW demand for any one billing period within the previous 12 months. Documentation is not required. No evaluation is conducted. Approximately 70–80% of eligible load has opted out.	-1
Iowa	Iowa Code § 476.6(15)(a)(1)(b) allows any customer of any rate-regulated utility to request an exemption from participation in the five-year energy efficiency plan if the cumulative cost effectiveness of the combined energy efficiency and demand response plan does not pass the Ratepayer Impact Measure (RIM) test. This applies to all customers, not only large ones. Utilities must allow the exemption (opt-out) beginning in the year following the year in which the request was made. Utilities may request modifications of their energy efficiency plans due to reductions in funding resulting from customer exemptions.*	-1
Kentucky	Opt-out is statewide for the industrial rate class. Documentation is not required. Approximately 80% of eligible load has opted out, with the remaining 20% made up primarily of TVA customers.	-1
Missouri	Opt-out is statewide only for investor-owned electric utilities. Eligibility requires one account greater than 5 MW, or aggregate accounts greater than 2.5 MW and demonstration of the customer's own demand-side savings. Also, interstate pipeline pumping stations of any size are eligible to opt out. To maintain opt-out status, documentation is required for customers whose aggregate accounts are greater than 2.5 MW. The staff of the Missouri Public Service Commission perform a desk audit of all claimed savings and may perform a field audit. No additional EM&V is required.	-1
North Carolina	All industrial-class electric customers are eligible to opt out. Also, by Commission Rule R8-68 (d), large commercial-class operations with 1 million kWh of annual energy consumption are eligible to opt out. Customers electing to opt out must notify utilities that they have implemented or plan to implement energy efficiency. Opted-out load represents approximately 40–45% of industrial and large commercial load.	-1

State	Opt-out description	Score
Ohio	Ohio Senate Bill 310 (2014) allowed certain large customers to opt out of energy efficiency programs entirely if they receive service above the primary voltage level (e.g., sub-transmission and transmission rate schedules) or are a C&I with more than 45 million kWh usage per year. HB 6, signed in 2019, expanded the opt-out to include any C&I customer that uses more than 700 MWh annually or is part of a national account involving multiple facilities in one or more states. A written request is required to register as a self-assessing purchaser pursuant to section 5727.81 of the Revised Code.	-1
Oklahoma	All transportation-only gas customers are eligible to opt out. For electric utilities, all customers whose aggregate usage (which may include multiple accounts) is at least 15 million kWh annually may opt out. Some 90% of eligible customers opt out.	-1
South Carolina	Industrial, manufacturing, and retail commercial customers with at least 1 million kWh annual usage are eligible to opt out. Only self-certification is required. Approximately 50% of eligible companies opt out, representing roughly 50% of the eligible load.	-1
Texas	In Texas, for-profit customers that take electric service at the transmission level are not allowed to participate in utilities' energy efficiency programs and therefore do not contribute to them. Manufacturers that qualify for a tax exemption under Tax Code §151.317 may also apply to opt out for three years, and opt-out status can be renewed.	-1
Virginia	The Virginia Clean Economy Act (2020) replaces a previous automatic opt-out for industrial customers above 500 kW with a process enabling industrial customers using more than 1 MW to opt out after demonstrating that they are achieving energy savings through their own energy efficiency measures. The VCEA directs the commission, no later than June 30, 2021, "to adopt rules or regulations (a) establishing the process for large general service customers to apply for such an exemption, (b) establishing the administrative procedures by which eligible customers will notify the utility, and (c) defining the standard criteria that shall be satisfied by an applicant in order to notify the utility, including means of evaluation measurement and verification and confidentiality requirements."	-1
West Virginia	Opt-out is developed individually by utilities. Customers with demand of 1 MW or greater may opt out. Participants must document that they have achieved similar or equivalent savings on their own to retain opt-out status. Claims of energy and/or demand reduction are certified to utilities, with future evaluation by the Public Service Commission to take place in a later proceeding. The method has not been specified. Twenty large customers have opted out.	-1

Maine does not require large electricity customers to pay into energy efficiency programming through rates, and thus these customers are ineligible for incentives from Efficiency Maine Trust's Electric Efficiency Procurement funds. The 1-point penalty has been removed for Maine this year given that efficiency incentives for these customers are funded with Forward Capacity Market (FCM) revenues and RGGI funds. Until recently, Maine's largest natural gas customers were also exempt from contributing to the Natural Gas Efficiency Procurement. However, in the spring of 2017, the legislature amended the law codifying the inclusion of large, non-generator users.* The RIM test treats reduced energy sales as a cost, which means that the more energy a measure saves, the less cost effective it is. It is likely that the plans will not meet this impact measure, raising the possibility that many customers will opt out and thereby reduce efficiency funding by the amount they otherwise would have paid.

Energy Efficiency Resource Standards

Energy efficiency targets for utilities, often called EERS, are critical to encouraging savings over the near and long terms. States with an EERS policy in place have shown average energy

efficiency spending and savings levels approximately four times as high as those in states without such a policy (ACEEE 2019). Savings from states with EERS policies in place accounted for approximately 80% of all utility savings reported across the United States in 2016 and 2017 (Gold et al. 2019). There are 27 states with EERS policies establishing specific energy savings targets that utilities and program administrators must meet through customer energy efficiency programs. This is one more than the 26 reported in the *2019 State Scorecard*, following the April 2020 signing of the Virginia Clean Economy Act, making the state the second in the Southeast—alongside Arkansas—with mandatory multiyear savings targets.

EERS policies set multiyear targets for electricity or natural gas savings, such as 1% or 2% incremental savings per year or 20% cumulative savings by 2025.[36] They differ from state to state, but each is intended to establish a sustainable, long-term role for energy efficiency in the state's overall energy portfolio. ACEEE considers a state to have an EERS if it has a policy in place that

- Sets clear, long-term (3+ years) targets for utility-sector energy savings
- Makes targets mandatory
- Includes sufficient funding for full implementation of programs necessary to meet targets

Several states mandate all cost-effective efficiency, requiring utilities and program administrators to determine and invest in the maximum amount of cost-effective efficiency feasible.[37] ACEEE considers states with such requirements to have EERS policies in place once these policies have met all the criteria listed above.

EERS policies aim explicitly for quantifiable energy savings, reinforcing the idea that energy efficiency is a utility system resource on par with supply-side resources. These standards help utility system planners more clearly anticipate and project the impact of energy efficiency programs on utility system loads and resource needs. Energy savings targets are generally set at levels that push efficiency program administrators to achieve higher savings than they otherwise would, with goals typically based on analysis of the energy efficiency savings potential in the state to ensure that the targets are realistic and achievable. EERS policies maintain strict requirements for cost effectiveness so that efficiency programs are guaranteed to provide overall benefits to customers. These standards help to ensure a long-term

[36] *Multiyear* is defined as spanning three or more years. EERS policies may set specific targets as a percentage of sales, as specific gigawatt-hour energy savings targets without reference to sales in previous years, or as a percentage of load growth.

[37] The seven states that require all cost-effective efficiency are California, Connecticut, Maine, Massachusetts, Rhode Island, Vermont, and Washington. Connecticut sets budgets first, then achieves all cost-effective efficiency within that limit, which is a lower savings target. New Hampshire's EERS sets forth a long-term goal of achieving all cost-effective efficiency, which is anticipated to be met through planning and goal-setting in future implementation cycles.

commitment to energy efficiency as a resource, building essential customer engagement as well as the workforce and market infrastructure necessary to sustain the high savings levels.[38]

States are increasingly seeking strategies to meet GHG reduction goals, for example through grid decarbonization and the electrification of buildings and vehicles. These efforts bring opportunities to adapt EERS policies to encourage resource-specific savings while also promoting technologies that may increase grid demand but result in net reductions in emissions. Redesigning goals and establishing new targets can help meet multiple policy objectives in these cases. Examples include establishing peak demand targets and fuel-neutral goals. These remove prohibitions on fuel switching to provide more flexibility and enable energy efficiency from beneficial electrification.

SCORES FOR ENERGY EFFICIENCY RESOURCE STANDARDS

A state could earn up to 3 points for its EERS policy. As table 16 shows, we scored states according to their electricity savings targets. States could earn an additional 0.5 points if natural gas was included in their savings goals.

Some EERS policies contain cost caps that limit spending, thereby reducing the policy's effectiveness. This year, we did not subtract points for the existence of a cost cap, although we do note whether a cost cap is in place in the results below (table 17). Most of the states with these policies in place have found themselves constrained. As a result, regulators have approved lower energy savings targets. In these cases, we score states on the lower savings targets approved by regulators that take the cost cap into account, rather than on the higher legislative targets.

In an effort to distinguish states pushing the boundaries of innovation in energy efficiency with ambitious goals, in 2017 we raised the threshold for the highest number of points to energy savings targets of 2.5% of sales or greater. Multiple states have proved that long-term savings of more than 2% are feasible and cost effective.

Table 16. Scoring of energy savings targets

Electricity savings target	Score
2.5% or greater	2.5
2–2.49%	2
1.5–1.99%	1.5
1–1.49%	1
0.5–0.99%	0.5
Less than 0.5%	0

Additional consideration	Score
EERS includes natural gas	+0.5

To aid in comparing states, we estimated an average annual savings target over the period specified in the policy. For example, in a June 2020 order New Jersey's Board of Public

[38] The ACEEE report *Next-Generation Energy Efficiency Standards* analyzed current trends in EERS implementation and found that utilities in 20 out of the 25 states examined met or exceeded their savings targets in 2017 (Gold et al. 2019).

Utilities called for electric savings targets of 1.1% beginning in 2022 and ramping up to 1.45%, 1.8%, and 2.15% in each subsequent year, translating to an average incremental savings target of 1.6% over that time span.

States with pending targets had to be on a clear path toward establishing a binding mechanism to earn points in this category. Examples of a clear path include draft decisions by commissions awaiting approval within six months and agreements among major stakeholders on targets.

Leadership, sustainable funding sources, and institutional support are required for states to achieve their long-term energy savings targets. Several states currently have (or in the past have had) EERS-like structures in place but have lacked one or more of these enabling elements and thus have undercut the achievement of their savings goals. Florida, for example, sets relatively low voluntary goals and does not earn points in this category.[39] Most states with EERS policies or other energy savings targets have met their goals and are on track to meet future goals (Gold et al. 2019).

At the same time, some states, such as Maine, have fallen short of EERS targets. We have scored these states on the basis of their policies, not on current performance, because they are losing points in other metrics such as spending and savings. We may change our scoring methodology in the future to reduce points allocated if a state does not hit savings targets.

EERS policies can vary widely with regard to the portion of statewide sales that they regulate. In several states, such as Colorado and New Mexico, an EERS may apply only to investor-owned utilities, meaning that smaller municipal utilities and electric cooperatives are exempt from meeting savings targets. While our scoring does not currently account for this variation in EERS coverage, we may revise our methodology to do so in the future. Table 17 lists scores, and Appendix D includes full policy details.

Table 17. State scores for energy efficiency resource standards

State	% of sales covered within EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas	Score (3 pts.)
Massachusetts	85%	2.7%		•	3
Rhode Island	99%	2.5%		•	3
Vermont	98%	2.4%		•	2.5
Arizona†	56%	2.1%		•	2.5
New York†	100%	2.0%		•	2.5
Illinois	89%	2.0%	•	•	2.5
Colorado	56%	1.7%		•	2

[39] In 2014 Florida utilities proposed reducing electric efficiency efforts from 2010 levels by at least 80%. The Florida Public Service Commission approved this proposal.

State	% of sales covered within EERS policy	Approximate average annual electric savings target for 2020–2025	Cost cap	Natural gas	Score (3 pts.)
New Jersey	100%	1.6%		•	2
Marylandt	97%	1.6%			1.5
Californiat	73%	1.4%		•	1.5
New Hampshire	100%	1.3%		•	1.5
Arkansas	50%	1.2%		•	1.5
Minnesotat	97%	1.2%		•	1.5
Oregont	61%	1.2%		•	1.5
Connecticut	93%	1.1%		•	1.5
Mainet	100%	1.0%		•	1.5
Michigan	100%	1.0%		•	1.5
Hawaii	100%	1.4%			1
Virginia	87%	1.2%			1
Nevada	88%	1.1%			1
New Mexico	69%	1.0%			1
Iowat	75%	0.9%	•	•	1
Washingtont	83%	0.9%		•	1
Wisconsin	100%	0.7%	•	•	1
Pennsylvania	96%	0.6%	•		0.5
North Carolina	100%	0.4%			0
Texast	74%	0.2%	•		0

States with voluntary targets are not listed in this table. Targets in states with cost caps reflect the most recent approved savings levels under budget constraints. See Appendix D for details and sources.

Utility Business Model and Energy Efficiency: Earning a Return and Fixed-Cost Recovery

Under traditional regulatory structures, utilities do not have an economic incentive to promote energy efficiency. They typically have a disincentive because falling energy sales from energy efficiency programs reduce utilities' revenues and profits—an effect referred to as *lost revenues* or *lost sales*. Because utilities' earnings are usually based on the total amount of capital invested in certain asset categories—such as transmission and distribution infrastructure and power plants—and the amount of electricity sold, the financial incentives are very much tilted in favor of increased electricity sales and expanding supply-side systems.

This dynamic has led industry experts to devise ways of addressing the possible loss of earnings and profit from customer energy efficiency programs and thereby removing utilities' financial disincentive to promote energy efficiency. Three key policy approaches properly

align utility incentives and remove barriers to energy efficiency. The first is to ensure that utilities can recover the direct costs associated with implementing energy efficiency programs. This is a minimum threshold requirement for utilities and related organizations to fund and offer efficiency programs; every state meets it in some form. Given the wide acceptance of program cost recovery, we do not address it in the *State Scorecard*.

The other two mechanisms are fixed-cost recovery (which comes in two general forms: full revenue decoupling and lost revenue adjustment mechanisms) and performance incentives. Revenue decoupling—the dissociation of a utility's revenues from its sales—aims to make the utility indifferent to decreases or increases in sales, removing what is known as the *throughput incentive*. Although decoupling does not necessarily make the utility more likely to promote efficiency programs, it removes or reduces the disincentive for it to do so.[40] Additional mechanisms for addressing lost revenues include modifications to customers' rates that permit utilities to collect these revenues, through either a lost-revenue adjustment mechanism (LRAM) or other ratemaking approach. LRAM allows the utility to recover lost revenues from savings resulting from energy efficiency programs while simultaneously increasing sales overall. LRAM does not eliminate the throughput incentive. ACEEE prefers the decoupling approach for addressing the throughput incentive and considers LRAM appropriate only as a short-term solution.

Performance incentives are financial incentives that reward utilities (and in some cases nonutility program administrators) for reaching or exceeding specified program goals. These may be based on achievement of energy savings targets or based on spending goals. Of the two, ACEEE recommends incentives based on achievement of energy savings targets. As table 19 shows, a number of states have enacted mechanisms that align utility incentives with energy efficiency.[41]

SCORES FOR UTILITY BUSINESS MODEL AND ENERGY EFFICIENCY

A state could earn up to 2 points in this category: up to 1 point for implementing performance incentive mechanisms and up to 1 point for implementing full revenue decoupling for its electric and natural gas utilities. We give only partial credit to LRAM policies for the reason discussed above. Table 18 describes our scoring methodology. Information about individual state decoupling policies and financial incentive mechanisms is available in ACEEE's State and Local Policy Database (ACEEE 2020b).

[40] Straight fixed variable (SFV) rate design is sometimes considered a simple form of decoupling that collects all costs regarded as fixed in a fixed monthly charge and collects all variable costs in volumetric rates. However, SFV collects the same monthly charge (and fixed costs) for all customers within a class, regardless of customer size. ACEEE discourages the use of SFV as it is not cost-based and sends poor price signals to customers to conserve electricity. For this reason, the *Scorecard* does not recognize SFV in its scoring methodology in this section.

[41] For a detailed analysis of performance incentives, see Nowak et al. (2015). For a detailed analysis of LRAM, see Gilleo et al. (2015a).

Table 18. Scoring of utility financial incentives

Decoupling	Score
Decoupling is in place for at least one major utility for both electric and natural gas.	1
Decoupling is in place for at least one major utility, either electric *or* natural gas. There is an LRAM or ratemaking approach for recovery of lost revenues for at least one major utility for both electric and natural gas.	0.5
No decoupling policy has been implemented, although the legislature or commission may have authorized one. An LRAM or ratemaking approach for recovery of lost revenues has been established for a major utility for either electric or natural gas.	0
Performance incentives	**Score**
Performance incentives have been established for a major utility (or statewide independent administrator) for both electric and natural gas.	1
Performance incentives have been established for a major utility (or statewide independent administrator) for either electric *or* natural gas.	0.5
No incentive mechanism has been implemented, although the legislature or commission may have authorized or recommended one.	0

This year, 29 states offer a performance incentive for at least one major electric utility, and 17 states have incentives for natural gas energy efficiency programs. Some states with third-party program administrators have performance incentives for the administrator rather than for the utilities. Thirty-two states have addressed disincentives for investment in energy efficiency for electric utilities. Of these, 15 have a lost revenue adjustment mechanism and 17 have implemented decoupling, with the most recent addition to the latter being New Mexico. For natural gas utilities, 7 states have implemented an LRAM and 25 have a decoupling mechanism. Table 19 outlines these policies.

Table 19. Utility efforts to address lost revenues and financial incentives

	Decoupling or LRAM			Performance incentives			
State	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Score (1 pt.)	Total score (2 pts.)
California	Yes	Yes	1	Yes	Yes	1	2
Connecticut	Yes	Yes	1	Yes	Yes	1	2
Hawaii [a]	Yes	—	1	Yes	—	1	2
Massachusetts	Yes	Yes	1	Yes	Yes	1	2
Minnesota	Yes	Yes	1	Yes	Yes	1	2
New York	Yes	Yes	1	Yes	Yes	1	2
Rhode Island	Yes	Yes	1	Yes	Yes	1	2

State	Decoupling or LRAM			Performance incentives			Total score (2 pts.)
	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Score (1 pt.)	
Vermont	Yes	Yes	1	Yes	Yes	1	2
Arkansas	Yes†	Yes†	0.5	Yes	Yes	1	1.5
Colorado	Yes	Yes†	0.5	Yes	Yes	1	1.5
District of Columbia	Yes	No	0.5	Yes	Yes	1	1.5
Kentucky	Yes†	Yes†	0.5	Yes	Yes	1	1.5
Michigan	No	Yes	0.5	Yes	Yes	1	1.5
New Hampshire	Yes†	Yes*	0.5	Yes	Yes	1	1.5
New Jersey	Yes[b]	Yes	1	Yes	No	0.5	1.5
New Mexico	Yes	Yes	1	Yes	No	0.5	1.5
Oklahoma	Yes†	Yes	0.5	Yes	Yes	1	1.5
South Dakota	Yes†	Yes†	0.5	Yes	Yes	1	1.5
Arizona	Yes†	Yes*	0.5	Yes	No	0.5	1
Georgia	No	Yes	0.5	Yes	No	0.5	1
Illinois	No	Yes	0.5	Yes	No	0.5	1
Indiana	Yes†	Yes	0.5	Yes	No	0.5	1
Maryland	Yes	Yes	1	No	No	0	1
North Carolina	Yes†	Yes	0.5	Yes	No	0.5	1
Ohio	Yes*	No	0.5	No	Yes	1	1
Oregon	Yes	Yes	1	No	No	0	1
Utah	No	Yes	0.5	Yes	No	0.5	1
Washington	Yes	Yes	1	No	No	0	1
Wisconsin	No	No	0	Yes	Yes	1	1
Idaho	Yes	No	0.5	No	No	0	0.5
Louisiana	Yes†	No	0	Yes	No	0.5	0.5
Maine	Yes	No	0.5	No	No	0	0.5
Mississippi	Yes†	Yes†	0.5	No	No	0	0.5
Missouri	Yes†	No	0	Yes	No	0.5	0.5
Nevada	Yes†	Yes	0.5	No	No	0	0.5
South Carolina	Yes†	No	0	Yes	No	0.5	0.5
Tennessee	No	Yes	0.5	No	No	0	0.5
Texas	No	No	0	Yes	No	0.5	0.5
Virginia	No	Yes	0.5	No	No	0	0.5
Wyoming	No	Yes	0.5	No	No	0	0.5
Alabama	No	No	0	No	No	0	0
Alaska	No	No	0	No	No	0	0
Delaware	No	No	0	No	No	0	0
Florida	No	No	0	No	No	0	0

State	Decoupling or LRAM			Performance incentives			Total score (2 pts.)
	Electric	Natural gas	Score (1 pt.)	Electric	Natural gas	Score (1 pt.)	
Iowa	No	No	0	No	No	0	0
Kansas	Yes†	No	0	No	No	0	0
Montana	No	No	0	No	No	0	0
Nebraska	No	No	0	No	No	0	0
North Dakota	No	No	0	No	No	0	0
Pennsylvania	No	No	0	No	No	0	0
West Virginia	No	No	0	No	No	0	0

* Both decoupling and lost revenue adjustment mechanism in place. † No decoupling, but lost revenue adjustment mechanism in place. A *yes* with neither asterisk nor dagger indicates that only decoupling is in place. [a] Hawaii received full points for both gas and electric because it uses minimal amounts of natural gas. [b] New Jersey allows for LRAM or limited decoupling, through a Conservation Incentive Program (CIP), a weather-normalized, symmetrical decoupling mechanism that includes a variable margin test and a supply capacity cost reduction test (as approved for PSE&G).

Utility Low-Income Energy Efficiency Programs

Low-income communities have historically experienced policies of systemic racial discrimination, which has led to disenfranchisement from income and wealth-building opportunities, especially for Black, Indigenous, and Hispanic communities. These policies also impact housing affordability, with research finding that low-income households tend to live in less efficient housing while devoting a greater proportion of their income to utility bills than do higher-income households (Bednar, Reames, and Keoleian 2017). ACEEE research finds that low-income, Black, Native American, and Hispanic people, as well as older adults, renters, and those residing in older buildings, spent a greater proportion of their income on energy bills (Drehobl, Ross, and Ayala 2020). Nationally, 67% of low-income households spend more than 6% of their income on their energy bills, compared with 25% of all households nationally (Drehobl, Ross, and Ayala 2020).

The legacy of historic and current systemic economic and social exclusion has led to a variety of factors that exacerbate home energy burdens. Some of these factors include racial segregation, high unemployment, high poverty rates, poor housing conditions, high rates of certain health conditions, lower educational opportunity, and barriers to accessing financing and investment (Jargowsky 2015; Cashin 2004). In addition, research has found that these factors also show up in the energy sector, as lower-income households and communities of color are more likely to live in older, poorly insulated homes with older, inefficient heating systems (Cluett, Amann, and Ou 2016). In addition, people living in rental properties may lack control over heating and/or cooling systems and appliances, which makes it difficult to influence decisions that might improve the efficiency of their homes.

ACEEE research has found that low-income weatherization and energy efficiency retrofits can reduce household energy burden by 25% on average (Drehobl, Ross, and Ayala 2020). Beyond simply lowering energy bills—thereby providing families with more disposable income for other necessities beyond energy—efficiency upgrades can also improve health and comfort. In fact, in its evaluation of the Weatherization Assistance Program, DOE found that the value of nonenergy benefits greatly exceeded the value of energy savings (Tonn et al. 2014).

Efforts to improve the reach of energy efficiency programs that serve income-qualified customers face several unique barriers and challenges. A 2019 study found that 11 large investor-owned utilities across six states had distributional disparities in low-income investments, meaning that they did not spend energy efficiency dollars in proportion to the size of low-income customer populations (Reames, Stacey, and Zimmerman 2019). Additionally, a 2018 report found that only 6% of U.S. energy efficiency spending in 2015 was dedicated to low-income programs (EDF 2018). Low-income households may face prohibitive up-front costs for energy efficiency investments and therefore benefit from low-income-focused programs that address this. Another barrier for low-income customers—who are more likely to be renters—is the so-called split incentive between renters and landlords. Simply put, there is a lack of motivation for landlords to invest in efficiency upgrades when they do not themselves pay for utilities. To help overcome these challenges, regulators can play a key role in encouraging or requiring utilities to carefully consider and expand the role of income-qualified energy efficiency programs within their portfolios.

In recognition of the efforts undertaken by states to strengthen utility-led low-income energy efficiency programs, we added an additional scoring metric beginning with the *2017 State Scorecard* to highlight examples of effective policy drivers that we continue to score, including:

- The adoption of state legislation, regulations, or commission orders establishing a savings goal or minimum required level of spending on low-income energy efficiency programs
- The development of cost-effectiveness rules that account for the additional benefits that energy efficiency delivers to income-qualified customers, such as NEB quantification, adders, or exemption of these programs from cost-effectiveness testing.

States can utilize a variety of policy mechanisms to ensure that levels of investment in or savings from income-qualified energy efficiency programs meet a minimum threshold. In the case of Pennsylvania, the public utility commission has incorporated a savings target specific to low-income programs within the state's EERS. It requires each utility to obtain a minimum of 5.5% of its total consumption reduction target from the low-income sector.

In most cases, however, low-income program requirements take the form of a legislative spending set-aside, through either the creation of a separate fund that receives a minimum annual contribution from ratepayers or a requirement that utilities spend a minimum amount or percentage of their revenues on low-income programs. For example, the Future Energy Jobs Act (SB 2814) passed in Illinois in December 2016 directed ComEd and Ameren Illinois to invest $25 million and $8.35 million per year, respectively, on low-income energy efficiency measures. Similarly, in August 2016, New Hampshire's public utilities commission, in an approved settlement agreement establishing a statewide EERS, increased the minimum low-income share of the overall energy efficiency budget from 15.5% to 17%. Minnesota legislation requires municipal gas and electric utilities to spend at least 0.2% of their gross operating revenue from residential customers on income-qualified programs, and investor-owned natural gas utilities must spend 0.4% of their gross operating revenue from residential customers on such programs. In other states, such as Connecticut and Michigan, utilities are simply required to see that budgets allocated to low-income programs are proportional to the revenues they expect to collect from that sector. Descriptions of state rules and regulations

establishing minimum levels of investment in low-income energy efficiency can be found in Appendix M.

Our scoring metric also recognizes public utility commissions that encourage investment in low-income energy efficiency programs by adapting cost-effectiveness screening and testing to give added consideration to the multiple important nonenergy benefits these programs produce, such as health and safety improvements. In some states, such as Illinois, Iowa, and Michigan, regulations clearly state that low-income programs are exempt from cost-effectiveness tests; in other states these exemptions may be granted in practice without being clearly stated or codified. Given the variation in policies and practices treating the cost effectiveness of income-qualified programs, some of which are established implicitly rather than explicitly within commission orders, we have tried to exercise flexibility in assigning points within this category.

Other approaches taken by program administrators to accommodate the higher costs and unique benefits of low-income programs include lowering the cost-effectiveness threshold for such programs or incorporating a percentage adder to approximate the nonenergy benefits that may otherwise be lost in a given cost–benefit calculation (as in Colorado and Vermont). In other cases, states have established methods to measure and calculate specific nonenergy benefits for inclusion in program screening. Still other states take a hybrid approach, utilizing an adder as well as incorporating NEBs that are easy to measure. Descriptions of each state's utility cost-effectiveness rules specific to low-income programs can be found in Appendix N.

SCORES FOR SUPPORT OF LOW-INCOME ENERGY EFFICIENCY PROGRAMS

In ACEEE's data request to states and utility commissions, we asked for information about the policy instruments discussed above. We also asked for specific levels of spending on low-income energy efficiency programs by states and utilities. This is distinct from funding provided by federal sources, such as DOE grant allocations for the Weatherization Assistance Program.

A state could earn up to 1 point in this category. To earn full credit, a state must have a legislative or regulatory requirement establishing minimum spending and/or savings levels for efficiency programs aimed specifically at low-income households, as well as established cost-effectiveness screening practices that accommodate or recognize the multiple nonenergy benefits of low-income energy efficiency programs. Alternatively, a state could earn full credit by demonstrating that utility spending for such programs equaled or exceeded $13 per income-qualified resident, based on the number of state residents below 200% of the federal poverty level according to the U.S. Census Bureau and Bureau of Labor Statistics.

States could earn 0.5 points if they had in place at least one of the two aforementioned policy instruments, or if they demonstrated that spending on low-income programs equaled or exceeded $6.50 per income-qualified resident.

Table 20 describes the scoring methodology.

Table 20. Scoring of support of low-income energy efficiency programs

Scoring criteria for low-income energy efficiency programs	Score
Legislative/regulatory requirements have established minimum spending or savings levels for low-income energy efficiency programs, *and* utility cost-effectiveness rules or exceptions have been established to provide flexibility for low-income programs. or Levels of spending on low-income energy efficiency equal or exceed $13 per income-qualified resident.	1
Legislative/regulatory requirements have established minimum spending or savings levels for low-income energy efficiency programs, *or* utility cost-effectiveness rules or exceptions have been established to provide flexibility for low-income programs. or Levels of spending on low-income energy efficiency are between $6.50 and $12.99 per income-qualified resident.	0.5

Table 21 shows the results of ACEEE's analysis, including levels of ratepayer-funded spending on low-income energy efficiency programs for states that provided this information through the *Scorecard* data request. These amounts are distinct from bill assistance programs and refer specifically to programs designed to improve energy efficiency through weatherization and/or energy-efficient retrofit programs that include measures such as home energy assessments, insulation, and air sealing. These amounts are also separate from federal funding, such as federal Weatherization Assistance Program (WAP) grant allocations. However, where utility or state funds have been deployed to support or supplement WAP programs or projects, we do include these in table 21.

It is important to note that states rely on a variety of funding sources to support energy efficiency measures in low-income households; these include both ratepayer dollars and government funds. For example, although Alaska reports little utility funding for low-income programs, state investment in weatherization on a per capita basis is among the highest in the nation, thanks to appropriations by the state legislature administered through the Alaska Housing Finance Corporation. In order to credit these efforts within the *State Scorecard* and avoid penalizing states that draw from diverse funding streams, any state-subsidized low-income funds reported by state energy offices in their answers to our data request have been combined with ratepayer funding for low-income programs and annotated accordingly in table 21.

Table 21. State scores for support of low-income energy efficiency programs

State	Requirements for minimum level of state or utility support of low-income programs	Special cost-effectiveness screening provisions or exceptions for low-income programs	2019 utility spending on low-income programs	2019 state spending on low-income programs per income-qualified resident*	Score (1 pt.)
Massachusetts	Yes[a]	Yes[d]	$130,302,412	$90.49	1
Rhode Island	No	Yes[d]	$19,829,994†	$75.98	1
Vermont	Yes[a]	Yes[g]	$10,300,000†	$72.54	1
Connecticut	Yes[abc]	Yes[e]	$31,144,990	$38.93	1
California	Yes[c]	Yes[f]	$415,883,884	$34.64	1
New Hampshire	Yes[a]	Yes[e]	$7,615,050‡	$32.54	1
Hawaii	No	No	$9,000,000	$30.10	1
Pennsylvania	Yes[bc]	Yes[e]	$92,176,986	$27.78	1
Illinois	Yes[a]	Yes[e]	$85,341,000	$26.95	1
Alaska	No	No	$4,700,000†	$23.04	1
Maryland	No	Yes[e]	$25,431,357†	$21.09	1
District of Columbia	Yes[a]	Yes[g]	$4,037,174†	$19.99	1
Montana	Yes[a]	Yes[e]	$5,298,163†	$16.87	1
Maine	Yes[a]	Yes[d]	$5,318,643†	$15.69	1
New Jersey	No	Yes[e,g]	$28,020,341	$15.29	1
Michigan	Yes[a]	Yes[e]	$37,835,679	$14.39	1
Minnesota	Yes[a]	Yes[e]	$17,732,767	$14.31	1
Oregon	Yes[a]	Yes[e]	$14,350,187	$13.09	1
Delaware	Yes[a]	Yes[d]	$2,568,774†	$11.62	1
New York	Yes[a]	Yes[e]	$62,757,043	$11.09	1
Oklahoma	Yes[a]	Yes[f]	$9,190,764	$7.41	1
Nevada	Yes[a]	Yes[e]	$4,719,105†	$5.15	1
New Mexico	Yes[a]	Yes[g]	$2,655,991	$3.15	1
Texas	Yes[a]	Yes[e]	-	-	1
Virginia	Yes[a]	Yes[e]	-	-	1
Wisconsin	Yes[a]	Yes[e]	-	-	1
Missouri	No	Yes[e]	$15,117,217	$8.91	0.5
Colorado	No	Yes[g]	$11,284,525†	$8.84	0.5
Iowa	No	Yes[e]	$4,595,799	$6.23	0.5

State	Requirements for minimum level of state or utility support of low-income programs	Special cost-effectiveness screening provisions or exceptions for low-income programs	2019 utility spending on low-income programs	2019 state spending on low-income programs per income-qualified resident*	Score (1 pt.)
Idaho	No	Yes[g]	$3,297,658	$6.08	0.5
Utah	No	Yes[g]	$4,093,339†	$5.77	0.5
Washington	No	Yes[e]	$7,500,000†	$4.50	0.5
Tennessee	No	Yes[e]	$9,225,752	$4.48	0.5
North Carolina	No	Yes[e]	$6,822,616	$1.97	0.5
Florida	No	Yes[e]	$7,215,685	$1.05	0.5
Georgia	No	Yes[e]	$2,959,612	$0.82	0.5
Arizona	No	Yes[e]	-	-	0.5
Arkansas	No	Yes[e]	-	-	0.5
Indiana	No	Yes[e]	-	-	0.5
Kansas	No	Yes[e]	-	-	0.5
Kentucky	No	Yes[e]	-	-	0.5
Mississippi	No	Yes[e]	-	-	0.5
Ohio	No	Yes[e]	-	-	0.5
South Carolina	No	Yes[e]	-	-	0.5
West Virginia	No	No	$712,183	$1.14	0
Nebraska	No	No	$342,784†	$0.72	0
Louisiana	No	No	$1,065,933	$0.63	0
Wyoming	No	No	$16,023	$0.10	0
Alabama	No	No	-	-	0
North Dakota	No	No	-	-	0
South Dakota	No	No	-	-	0

* 2018 low-income population based on number of residents below 200% of the federal poverty level, according to U.S. Census Bureau and Bureau of Labor Statistics 2019 Current Population Survey (CPS) Annual Social and Economic (ASEC) Supplement. † At least a portion of spending includes non-ratepayer/state-subsidized program funds. ‡ 2018 ratepayer funds. [a] A required level of spending on low-income energy efficiency has been established. [b] A required savings goal for low-income energy efficiency has been established. [c] A customer participation goal has been established. [d] Quantifiable low-income NEBs are included in cost–benefit calculations. [e] Low-income programs are not required to pass, or are exempted from passing, cost-effectiveness tests. [f] Cost-effectiveness threshold is lowered to accommodate low-income programs. [g] Multiplicative adder is applied to approximate low-income NEBs.

Leading and Trending States: Low-Income Energy Efficiency Programs

Virginia. The state has taken significant steps in recent years to strengthen efficiency offerings for low-income customers, including provisions in the 2018 Grid Transformation & Security Act (GTSA), which called upon the state's investor-owned utilities to greatly ramp up overall efficiency spending and established minimum funding levels for programs benefiting low-income customers. The Virginia Clean Economy Act, signed in April 2020, includes additional measures to reduce the low-income energy burden, including raising minimum funding levels from 5% to 15% for programs for low-income, elderly, or disabled individuals as well as veterans. The VCEA also establishes a percentage of income payment program (PIPP) to cap monthly electric utility payments for such ratepayers at 6% or 10% (for those with electric heat). Other environmental justice measures call for considering low-income areas, areas near fossil fuel infrastructure, and historically disadvantaged communities when planning new renewable projects, energy programs, and job training.

New York. In mid-2020, the New York State Energy Research and Development Authority (NYSERDA) and the state's investor-owned utilities (IOUs) introduced a new framework that will invest $880 million through 2025 to improve access to energy efficiency and clean energy solutions for low-to-moderate-income (LMI) households and affordable multifamily buildings. The plan will help to provide an enhanced and more coordinated and consistent approach to LMI services across the state. The framework will more than double the number of these households and buildings receiving energy efficiency services and increase the outreach, education, and community-based support programs for efficiency improvements. The initiative will also expand ongoing efforts to advance buildings electrification via research and analysis of institutional barriers for LMI communities. The plan will support the state's Climate Leadership and Community Protection Act while ensuring that its goals are reached in a just and equitable manner (New York Office of the Governor 2020).

Colorado. Xcel Energy's Low-Income Program provides a range of weatherization services and other energy efficiency measures for income-qualified customers through a multipronged approach and partnership with several nonprofit organizations. As administrator, Xcel Energy performs engineering analysis to determine cost effectiveness and approve rebates. The utility works with Energy Outreach Colorado (EOC), an independent nonprofit created by the state. EOC leverages multiple funding sources to create and expand low-income energy assistance programs. For example, Xcel and EOC developed a single-family program serving households making up to 80% of area median income to reach previously ineligible participants. Since 2009 the partnership among Xcel, EOC, and other participants has served 38,000 households, leveraged $5 million in outside funding, and saved 45 GWh and 5 million therms.

District of Columbia. The DC Council's adoption of the Clean and Affordable Energy Act of 2008 authorized the DC Sustainable Energy Utility (DCSEU) to establish a separate Energy Assistance Trust Fund (EATF). The EATF was to be used solely to fund low-income programs in the amount of $3.3 million annually. For the 2017–2021 program cycle, the low-income spending requirement was raised to 20% of expenditures ($3.9 million), with the addition of an annual low-income goal to save 46,556 MMBtus in electricity and natural gas. DCSEU's Low-Income Multifamily Custom Program, which began in October 2017, has already shown success, providing improvements to 20 properties comprising 1,770 housing units in its first year while building a strong network of key multifamily stakeholders (Samarripas and York 2019).

Massachusetts. According to Massachusetts's 2008 Green Communities Act, a minimum of 10% of electric utility budgets and 20% of gas utility budgets must serve income-qualified residents. These programs are delivered by the Low-Income Energy Affordability Network (LEAN), an association of community action agencies. LEAN coordinates administration of government- and utility-funded energy efficiency services to income-qualified customers, leveraging multiple funding sources and standardizing various program rules and eligibility requirements. LEAN also regularly hosts meetings in which utilities and nonprofit agencies discuss program and funding consistency and review potential new measures.

State policies enabling fuel switching and beneficial electrification in buildings

The past several years have seen a surge in states setting or strengthening clean energy goals, with almost half of the states now pledging to reduce greenhouse gas emissions and more than a dozen aiming for 100% carbon-free or net-zero electricity (NRDC 2020). To meet these goals, program administrators in several states are promoting electrification of space and water heating as an important building decarbonization tool. Policies of this type enable incentives for technologies like air and ground source heat pumps to displace direct fossil fuel use and can reduce emissions by shifting end uses onto the electric grid as it grows cleaner alongside a higher penetration of renewable energy sources.

While regulators in a handful of states have taken proactive steps to create or clarify rules and guidelines surrounding fuel switching, striking a balance among policy levers addressing energy efficiency in order to reduce power sector emissions, strategic electrification is a still-emerging field. Typically state energy efficiency policies address fuel types in isolation without considering the net societal and participant benefits of fuel-switching technologies. Sometimes fuel-switching programs are expressly prohibited by state rules; in other states, uncertainty or lack of state guidance has also impeded electrification efforts.

ACEEE research has begun to track the details of the current state policy landscape as it pertains to fuel switching in order to inform efforts by regulators and program administrators to design fuel-switching programs that are beneficial—i.e., that transition from higher-cost, higher-emitting fuel sources for heating to lower-cost, lower-emitting fuel sources (ACEEE 2020c). Generally we have found that state policies fall into five categories:

- Fuel switching is addressed through guidelines or fuel-neutral goals. Note that a state in this category may have set goals but may not yet have adjusted other factors like cost-effectiveness testing and potential studies.
- Supportive policies are in in place, with additional specific guidance or rules pending.
- There is no policy, but utilities or program administrators have received approval for fuel switching or substitution programs in certain cases.
- Fuel switching or substitution is prohibited or discouraged.
- No fuel-switching or substitution policies or programs are in place.

Table 22 below captures our current classification of state fuel switching policies, or lack thereof, as of July 2020. In on our ongoing effort to align the *State Scorecard* with emerging best practices, we are exploring ways to introduce a new scoring metric that recognizes the work of leading states to harmonize energy efficiency rules with electrification in a way that maximizes their public benefit by reducing costs and meeting climate goals. As one can see, more than half of states have no relevant policy in place, while 11 explicitly prohibit or discourage fuel-switching measures. For the few leading states—mostly located in the

Northeast—more details can be found in ACEEE's April 2020 policy brief on state fuel switching rules, which we plan to update as new practices emerge.[42]

Table 22. Fuel-switching policy status by state

Policy status	West	Midwest	South	Northeast
Fuel switching is addressed through guidelines or fuel-neutral goals (5 states)	Alaska, California		Tennessee	Massachusetts, Vermont
Supportive policies are in place, with additional specific guidance or rules pending (5 states)	Colorado			Connecticut, Maine, New Jersey, New York
No policy, but utilities have received approval for fuel substitution programs in certain cases (8 states and DC)		Illinois, Michigan, Wisconsin	Alabama, Georgia	Delaware, District of Columbia, New Hampshire, Rhode Island
Fuel switching or substitution is prohibited or discouraged (11 states)	Arizona, Washington	Kansas, Minnesota, Oklahoma	Arkansas, Louisiana, South Carolina, Texas, West Virginia	Pennsylvania
No policy is in place (21 states)	Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Wyoming	Indiana, Iowa, Missouri, Nebraska, North Dakota, Ohio, South Dakota	Florida, Kentucky, Mississippi, North Carolina, Virginia	Maryland

[42] The brief can be found at aceee.org/policy-brief/2020/04/state-policies-and-rules-enable-beneficial-electrification-buildings-through.

Chapter 3. Transportation Policies

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INTRODUCTION

The transportation sector is the largest source of GHG emissions in the United States and accounts for approximately 28% of economy-wide GHG emissions (EPA 2020b). At the federal, state, and local levels, a comprehensive approach to transportation GHG emissions includes addressing the energy efficiency of both individual vehicles and the transportation system as a whole, particularly its interrelationship with land-use policies. Starting with the Energy Independence and Security Act of 2007, the federal government has addressed vehicle energy use through joint GHG and fuel economy standards for light- and heavy-duty vehicles. However, the federal government has recently rolled back federal light-duty standards, putting a spotlight on the role of states in maintaining progress on fuel efficiency. States and local governments continue to lead the way in creating policies for other aspects of transportation efficiency and GHG reduction.

Scores for the transportation category reflect state actions that go beyond federal policies to achieve a more energy-efficient transportation sector. These may be measures to improve the efficiency of vehicles purchased or operated in the state, policies to promote more efficient modes of transportation, or steps to integrate land-use and transportation planning in order to reduce the need to drive. To accommodate recent trends in state policy, we have added two new metrics this year that reflect action on the deployment of electric vehicles. We now score states on whether or not they have additional registration or road fees for EVs in place, and on the number of available charging locations per capita.

SCORING AND RESULTS

At the national level, the current administration's recent rollback of the light-duty fuel economy and GHG standards calls for a 1.5% nominal annual increase in fuel efficiency instead of the 4-5% improvement that would have taken effect for model year 2021–2026 vehicles. As a result, the states' role in ensuring continued progress toward high-efficiency vehicles is all the more critical.[43]

We awarded states that have adopted California's vehicle-emissions standards 1 point. Washington State is the most recent state to adopt these standards, and Nevada, New Mexico, and Minnesota have signaled their intention to adopt. Given the efficiency gains achievable through vehicle electrification, we gave states that also adopted California's light-duty Zero-Emission Vehicle (ZEV) program 0.5 points. States with more than 30 registered EVs per 100,000 people qualified for an additional 0.5 points, and those with more than 70 EVs per 100,000 earned 1 full additional point. Similarly, states with 15 public charging stations per 100,000 people earned 1 point, and those with more than eight public charging locations per 100,000 people earned 0.5 points. The only chargers we counted were non-brand-specific L2 and DCFC chargers with CHAdeMO, CCS, or J1772 compatibility that were installed and publicly

[43] Fuel economy standards adopted for model years 2022–2025 were provisional, and both fuel economy and GHG emissions standards for these model years, as well as for MY 2021, are currently under review.

available for use as of October 25, 2020.[44] We also evaluated state fees for electric vehicles and awarded 1 point to states that have no EV fee or a fee that is less than or equal to 100% of the annual average gasoline tax revenue from the average individual driver. States where the EV fee is from 101% to 125% of gasoline tax revenues earned no points, and those with an EV fee greater than 125% of gasoline revenues lost 1 point. We awarded 0.5 points to states with consumer incentives for the purchase of high-efficiency vehicles.

States can also lead the way in improving the efficiency of transportation systems more broadly. This includes taking steps to promote the use of less energy-intensive transportation modes. States that have a dedicated revenue stream for public transit earned 0.5 points in this year's *State Scorecard*. Twenty-five states have statutes that provide sustainable funding sources for transit-related capital and/or operating expenses. For details, see Appendix H. States also received points based on the magnitude of their transit spending. Per capita spending of $100 or more received 1 point, while expenditures of $20 or more but below $100 per capita received 0.5 points.

Policies that promote compact development and ensure the accessibility of major destinations are essential to reducing transportation energy use in the long term. States with smart growth statutes earned 1 point. Twenty-three states earned points in this category. These statutes include the creation of zoning overlay districts, such as the New Hampshire RSA 9-B program, as well as various other incentives to encourage development patterns that reduce the need to drive.

States that adopted reduction targets for vehicle miles traveled (VMT) or transportation-specific GHG reduction goals statewide were also eligible for 1 point. Only nine states earned points in this category. We also calculated the percentage change in VMT per capita over a 10-year period for three time frames (2007–2016, 2008–2017, and 2009–2018) and averaged them to evaluate a given state's trend in VMT growth. We awarded 1 point to states whose average 10-year VMT per capita figure fell by 5% or more between 2016 and 2018. A reduction of 1% or more but below 5% earned 0.5 points. One state, New York, as well as the District of Columbia, earned the full point for this metric. We also awarded 0.5 points to states with complete streets statutes, which ensure adequate attention to the needs of pedestrians and cyclists in all road projects.

Regarding freight system efficiency, we changed our methodology this year so that states could earn 0.5 points if the objectives of their freight plans specifically include reducing GHG emissions or energy consumption or shifting modes to more efficient forms of freight movement. They could earn an additional 0.5 points if their freight plans included an energy intensity, GHG reduction, or mode share goal. California is the only state to earn that credit, for its freight-related GHG reduction goal.

We also evaluated state policies that encourage equitable access to efficient transportation options. States earned 0.5 points if they have policies in place to encourage inclusion of low-income housing in transit-oriented neighborhoods and an additional 0.5 points if they use

[44] L2 and DCFC chargers are different forms of EVSE chargers. L2 chargers have a minimum voltage of 240 volts and DCFC chargers have a minimum voltage of 480 volts. CHAdeMO, CCS, and J1772 fittings were the only style of charger fitting that we considered scoring for this year's scorecard.

distance from transit facilities as a criterion for awarding federal low-income tax credits to qualifying property owners.

Table 23 shows state scores for transportation policies. ACEEE recognizes that due to variations in states' geography and urban/rural composition, some states cannot feasibly implement some of the policies mentioned in this chapter. Nevertheless, every state can make additional efforts to reduce its transportation energy use, and this chapter illustrates several approaches. Additional details on incentives for the purchase of high-efficiency vehicles, state transit funding, and transportation legislation are included in Appendixes G, H, and I.

Date Filed: April 29, 2022

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Table 23. Transportation policies by state

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (1 pt.)[2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.)[6]	Average % change in VMT per capita (1 pt.)[7]	Integration of transportation and land-use planning (1 pt.)[8]	Complete streets legislation (0.5 pt.)[9]	Transit funding (1 pt.)[10]	Dedicated transit revenue stream statutes (0.5 pts.)[11]	Freight system efficiency goals (1 pt.)[12]	Equitable access (1 pt.)[13]	Total score (12 pts.)
District of Columbia	1.5	1	1	1	0.5	1	1	1	0.5	1	0	0.5	1	11
California	1.5	1	1	1	0.5	1	0	1	0.5	0.5	0.5	1	1	10.5
New York	1.5	1	1	0.5	0.5	1	1	1	0.5	1	0.5	0.5	0.5	10.5
Massachusetts	1.5	1	1	0.5	0.5	1	0	1	0.5	1	0.5	0.5	1	10
Maryland	1.5	1	1	0.5	0	1	0	1	0.5	1	0.5	0.5	1	9.5
Connecticut	1.5	1	1	0.5	0.5	0	0	1	0.5	1	0	0.5	1	8.5
Oregon	1.5	1	1	0.5	0.5	1	0	1	0.5	0	0.5	0.5	0.5	8.5
Vermont	1.5	1	1	1	0.5	1	0.5	1	0.5	0	0	0.5	0	8.5
Washington	1.5	1	1	0.5	0.5	1	0.5	1	0.5	0	0.5	0	0.5	8.5
Rhode Island	1.5	1	1	0.5	0	0	0.5	1	0.5	0.5	0	0.5	1	8
Colorado	1.5	1	1	1	0.5	0	0.5	0	0.5	0	0.5	0.5	0.5	7.5
Maine	1.5	1	1	0.5	0.5	0	0	1	0.5	0	0.5	0.5	0.5	7.5
Minnesota	0.5	1	1	0	0	1	0.5	0	0.5	0.5	0.5	0.5	1	7
New Jersey	1.5	1	1	0	0.5	0	0	1	0.5	0.5	0	0.5	0.5	7
Delaware	1	1	1	0	0.5	0	0	1	0.5	1	0	0.5	0	6.5
Pennsylvania	1	1	1	0	0.5	0	0.5	0	0.5	1	0.5	0.5	0	6.5
Hawaii	0	1	1	1	0	0	0	1	0.5	0	0.5	0.5	0.5	6
Virginia	0	1	1	0	0.5	0	0.5	1	0.5	0.5	0.5	0	0.5	6
Michigan	0	1	1	0	0	0	0	1	0.5	0.5	0.5	0.5	0.5	5.5
Arizona	0	1	1	0	0.5	0	0.5	1	0	0	0	0.5	0.5	5

State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (1 pt.)[2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.)[6]	Average % change in VMT per capita (1 pt.)[7]	Integration of transportation and land-use planning (1 pt.)[8]	Complete streets legislation (0.5 pt.)[9]	Transit funding (1 pt.)[10]	Dedicated transit revenue stream statutes (0.5 pts.)[11]	Freight system efficiency goals (1 pt.)[12]	Equitable access (1 pt.)[13]	Total score (12 pts.)
Florida	0	1	1	0	0	0	0.5	0	0.5	0	0.5	0.5	1	5
Illinois	0	1	0	0	0	0	0	1	0.5	1	0.5	0.5	0.5	5
Tennessee	0	1	1	0	0	0	0	1	0.5	0	0.5	0.5	0.5	5
North Carolina	0	1	1	0	0	0	0	1	0.5	0	0.5	0.5	0	4.5
Utah	0	1	1	0.5	0.5	0	0	0	0.5	0	0.5	0.5	0	4.5
Nevada	0.5	1	1	0	0	0	0	0	0.5	0	0	0.5	0.5	4
Alaska	0	1	1	0	0	0	0.5	0	0	1	0	0	0	3.5
Iowa	0	0.5	1	0	0	0	0	1	0	0	0.5	0.5	0	3.5
New Hampshire	0	1	1	0	0	0	0	1	0	0	0	0.5	0	3.5
New Mexico	0.5	1	1	0	0	0	0	0	0	0	0	0.5	0.5	3.5
Texas	0	1	1	0	0.5	0	0	0	0.5	0	0	0.5	0	3.5
Oklahoma	0	1	1	0	0.5	0	0.5	0	0	0	0	0.5	0	3.5
Indiana	0	1	0	0	0	0	0	0	0.5	0	0.5	0.5	0.5	3
Kentucky	0	0.5	1	0	0	0	0	0	0	0	0	0.5	1	3
Louisiana	0	0.5	1	0	0.5	0	0	0	0.5	0	0	0.5	0	3
Missouri	0	1	0	0	0	0	0	0	0.5	0	0	0.5	1	3
Montana	0	1	1	0	0	0	0	0	0	0	0	0.5	0	2.5
South Carolina	0	0.5	1	0	0	0	0	0	0.5	0	0	0.5	0	2.5
Wisconsin	0	1	1	0	0	0	0	0	0	0	0	0.5	0	2.5
Kansas	0	1	0	0	0	0	0	0	0	0	0.5	0.5	0	2
Nebraska	0	0.5	1	0	0	0	0	0	0	0	0	0.5	0	2

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State	GHG tailpipe emissions standards and ZEV program (1.5 pts.)[1]	EV registrations per 100,000 people (1 pt.)[2]	EV fees[3] (1 pt.)	EVSE[4] (1 pt.)	High-efficiency consumer incentives[5] (0.5 pts.)	VMT targets (1 pt.)[6]	Average % change in VMT per capita (1 pt.)[7]	Integration of transportation and land-use planning (1 pt.)[8]	Complete streets legislation (0.5 pt.)[9]	Transit funding (1 pt.)[10]	Dedicated transit revenue stream statutes (0.5 pts.)[11]	Freight system efficiency goals (1 pt.)[12]	Equitable access (1 pt.)[13]	Total score (12 pts.)
North Dakota	0	0.5	0	0	0	0	0	1	0	0	0	0.5	0	2
South Dakota	0	0.5	1	0	0	0	0.5	0	0	0	0	0	0	2
Georgia	0	1	-1	0	0	0	0	0	0.5	0	0.5	0	0.5	1.5
Idaho	0	1	0	0	0	0	0	0	0	0	0	0	0	1
West Virginia	0	0	0	0	0	0	0	0	0.5	0	0.5	0	0	1
Alabama	0	0.5	-1	0	0	0	0	0	0	0	0.5	0.5	0	0.5
Mississippi	0	0	-1	0	0	0	0.5	0	0.5	0	0	0.5	0	0.5
Ohio	0	1	-1	0	0	0	0	0	0	0	0	0.5	0	0.5
Wyoming	0	0.5	-1	0	0	0	0.5	0	0	0	0	0.5	0	0.5
Arkansas	0	0	-1	0	0	0	0	0	0	0	0.5	0.5	0	0

Sources: [1] Lutsy and Slowik 2019. [2] IHS Automotive Polk 2020; state data requests. [3] DOE 2020b. [4]DOE 2020b. [5]DOE 2020a. [6] State legislation. [7] FHWA 2020. [8] State legislation. [9] NCSC 2018. [10] AASHTO 2020. [11] State legislation. [12] State freight plans. [13] State legislation.

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DISCUSSION

Tailpipe Emissions Standards and the Zero-Emission Vehicle Program

The U.S. Department of Transportation (DOT) has regulated the fuel economy of automobiles since Corporate Average Fuel Economy (CAFE) standards were adopted in 1975. States are not permitted to adopt fuel efficiency standards per se. As a longtime leader in vehicle emissions reduction, however, California has authority to set its own vehicle emissions standards, including for GHG emissions. Other states may choose to follow federal or California standards. In 2002, California passed the Pavley Bill (AB 1493), the first law in the United States to address GHG emissions from vehicles. The GHG reductions from this law were expected to be achieved largely through improved fuel efficiency, making these standards, to a large degree, energy efficiency policies. Given auto manufacturers' preference for regulatory regimes that allow them to offer identical vehicles in every state, California's program has been instrumental in prodding the federal government to continue to increase the stringency of vehicle standards, drawing new efficiency technologies into the market.

Pursuant to the *Massachusetts v. Environmental Protection Agency* court decision in 2007, the EPA began regulating vehicle GHG emissions as well. Starting with model year 2012, the EPA, DOT, and the California Air Resources Board (CARB) have had harmonized standards for fuel economy and GHG emissions. In 2010 the agencies set new GHG and fuel economy standards for model years 2012 through 2016. In 2012 the agencies extended the standards to model years 2017–2025, projecting a fleetwide GHG emissions average of 54.5 miles per gallon by 2025. The DOT standards for model years 2022–2025 were provisional, and all three agencies were to participate in a midterm review of the appropriateness of the final four years of the standards. In early 2017, EPA and CARB determined that these standards remained appropriate.

The Trump administration reopened EPA's midterm review shortly after the inauguration in 2017, and in April 2018 the EPA released a new determination that these future standards were no longer appropriate. A joint DOT and EPA rule rolling back the standards for model years 2021–2026 was finalized in April 2020. The administration also revoked California's authority to set GHG standards in the fall of 2019. As the state challenges the decision, other states' adoption and support of California's standards will be critical in maintaining California's authority and progress toward clean, fuel-efficient vehicles. California has also updated its Zero-Emission Vehicle (ZEV) program, requiring a more ambitious increase in sales of plug-in hybrid, battery electric, and fuel-cell vehicles from 2018–2025 in order to reduce GHG and criteria pollutant emissions. Manufacturers of passenger cars and light trucks (up to 8,500 pounds) must earn a certain number of ZEV credits by meeting state requirements regarding the number and type of ZEVs they must produce and deliver for sale (C2ES 2017).

Fourteen states and the District of Columbia now use California's GHG regulations: Colorado, Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington (Lutsy and Slowik 2019). (Arizona and Florida also adopted California's standards but repealed them in 2012.) Washington is the most recent state to adopt these standards, finalizing its rule in March 2020. Nevada, New Mexico, and Minnesota are

planning to adopt California's standards. Twelve of these states and the District of Columbia have adopted California's ZEV requirements as well.

Electric Vehicle and Charging Infrastructure Deployment

As more EVs become available to drivers and electric vehicles become a critical part of state strategy to address transportation GHG emissions, states can help remove the barriers to their widespread adoption. In addition to reducing the higher up-front costs of these vehicles, states can provide incentives for the construction of the required fueling infrastructure. Additionally, states can offer nonfinancial benefits—such as emissions testing exemptions—that make it more convenient to own an EV. The numbers of EV registrations and publicly available charging stations per capita in a given state are indicative of the success of a state's policies to increase the uptake of electric vehicles. Due to feedback we have received, we are considering using the number of charging ports instead of the number of charging stations in the next *State Scorecard*.

State EV Fees

Projections anticipate a steep increase in the rate of EV penetration across the country. As electric vehicle sales begin to ramp up, some states have applied additional registration fees to these vehicles. To date, 28 states have done so, including Arkansas, Connecticut, Maine, and North Dakota. Bills on the table across the country propose annual fees ranging from $25 (New Mexico) to $213 (Georgia). Judging from a review of a small sample of state bills, the primary motivation for these fees is to replace lost future gasoline tax revenues that fund road maintenance. One state, Washington, intends to use the funds for a different purpose: building out EV charging infrastructure to support increased deployment.

While it makes sense for all vehicle owners to contribute to the maintenance of the roads they drive on, there are several issues that these surcharges bring to light. First, EV fees can be at odds with state targets for EV deployment. Numerous states have tax credits in place to encourage EV sales (see Appendix G) yet also have high additional registration costs for EV drivers. These policies work against each other (Tomich 2019).

Moreover, these fees in some cases exceed what the driver of an average gasoline-fueled car pays in gas taxes. Some states' EV fees are based on inaccurate tax calculations that use high annual VMT figures and low average vehicle fuel economy. As an example, North Carolina's first EV fee was set by assuming that the average vehicle in the state is driven much more than the average gasoline vehicle in the United States at 15,000 miles a year and gets a mere 20 miles per gallon—and therefore pays more than $270 annually in gasoline taxes (Stradling 2019). Finally, EV fees in many states do not take into consideration that EV owners pay other taxes that owners of gasoline-powered vehicles do not.

In any case, there is little justification for high surcharges on advanced-technology vehicles, and such charges will disincentivize the development of technologies that reduce emissions. In fact, some EV fee proposals appear to be designed for that purpose. The American Legislative Exchange Council, which receives funding from fossil fuel interests, pushed for steep EV fees in states and campaigned against the federal EV tax credit in 2018 and 2019 (Lunetta 2018). The aim of our scoring approach for this metric is to balance the need for states to promote EV sales in what is still a relatively new market with the need for users to

pay their fair share of road costs. We have scored states by comparing their EV fees with the amount of gasoline tax revenue collected for the average car. We recognize that this is not a full accounting of the fees that an EV driver might pay compared with what a driver of a conventional vehicle might pay; for instance, we know EV drivers pay state taxes on the electricity they use to charge their vehicles (albeit a very small charge compared with gasoline tax spending). Still, we think this is a simple and reasonable methodology.

Incentives for High-Efficiency Vehicles

When fuel-efficient vehicles contain new, advanced technologies, high purchase cost is a barrier to their entry into the marketplace. To encourage consumers to purchase fuel-efficient vehicles, states may offer a number of financial incentives, including tax credits, rebates, and sales tax exemptions. Several states offer tax incentives to purchasers of alternative-fuel vehicles—including those that run on compressed natural gas, ethanol, propane, or electricity—and in some cases to purchasers of hybrid vehicles (electric or hydraulic). Although alternative-fuel vehicles can provide environmental benefits by reducing pollution, they are not necessarily more fuel efficient, and in the *State Scorecard* we did not credit policies that promote their purchase. However, we did credit incentives for plug-in vehicles and hybrids, which do generally have high fuel efficiency. Given the arrival of a wide range of these vehicles in recent years, tax credits are playing an important role in spurring their adoption.

We did not give credit for the use of high-occupancy vehicle lanes and preferred parking programs for high-efficiency vehicles, as they promote increased vehicle use and consequently may not deliver net energy benefits.

Vehicle Miles Traveled (VMT) Growth and VMT Reduction Targets

Improved vehicle efficiency will not adequately address energy use and GHG emissions in the transportation sector in the long term if growth in total VMT goes unchecked. EIA predicts a 20% increase in light-duty VMT between 2018 and 2050 due to rising incomes and population growth. VMT for all vehicle types is expected to increase by 1.1% annually over the next 20 years (EIA 2019a). Reducing VMT growth is key to managing transportation energy use, and several states have taken on this challenge by setting VMT reduction targets.

Integration of Land-Use and Transportation Planning

Success in achieving VMT reduction targets requires the coordination of transportation and land-use planning. Successful strategies vary among states due to differences in their infrastructure, geography, and political environment. However, all states benefit from adopting core principles of smart growth and integrating transportation and land-use planning in order to increase transportation system efficiency. Integrated approaches include measures that encourage:

- Transit-oriented development, including mixed land use (combining jobs, stores, and housing) and good street connectivity to make neighborhoods friendly to all modes of transportation
- Areas of compact development
- Convenient modes of transportation that provide alternatives to driving

- Centers of activity where popular destinations are close together and accessible by multiple transportation modes

Complete Streets Policies

Complete streets policies focus on street connectivity and aim to create safe, easy access to roads for all pedestrians, bicyclists, motorists, and public transportation users. Such policies foster increased use of alternatives to driving and thus can contribute to reducing fuel consumption. According to the National Complete Streets Coalition, modest increases in biking and walking could save 2.4 billion gallons of fuel annually across the country (NCSC 2012). A complete streets policy directs states' transportation agencies to evaluate and incorporate complete streets principles and tasks transportation planners with ensuring that all roadway infrastructure projects allow for equitable access to and use of those roadways.

State Transit Funding

While states receive some federal funds for public transit, a significant proportion of transit funding comes from state budgets. A state's investment in public transit is a key indicator of its interest in promoting energy-efficient modes of transportation.

Dedicated Transit Revenue Streams

As states face increasingly uncertain federal funding streams and federal transportation policies that remain highway focused, many have taken the lead in finding dedicated funding sources for long-term public transit expenditures. A number of states have adopted a legislative approach to generating a sustainable stream of capital and operating funds. For instance, in 2018 Alabama established a trust fund under the Alabama Public Transportation Act to increase public transportation options in the state.

Freight

Many states have freight transportation plans in place. The federal Fixing America's Surface Transportation (FAST) Act, adopted in 2015, superseded the Moving Ahead for Progress in the 21st Century (MAP-21) Act. FAST requires states to develop short- and long-range freight plans in order to receive federal funds for freight projects. Final plans were required by December 2017. Additionally, FAST created a separate pot of money for intermodal and rail freight projects. Each state is allowed to set aside up to 10% of federally awarded funds for eligible non-highway projects (114th Congress 2015). Pursuant to FAST, states must also include multimodal strategies in their freight plans.

These plans can be strengthened by adopting concrete targets or performance measures that establish energy efficiency as a priority for goods movement. Such measures involve tracking and reporting the fuel used for freight movement in the state as a whole and encourage the use of energy efficiency as a criterion for selecting or evaluating freight projects. States can formulate these performance targets in terms of gallons of fuel per ton-mile of freight moved, for example, or grams of GHG emitted per ton-mile of freight, and targets should reflect performance across all freight modes.

Equitable Access to Transportation

As cities have sprawled and jobs have moved away from urban cores in the United States, many low-income communities have become geographically more isolated and

inadequately served by affordable, efficient transportation. In such cases, personal vehicles become the only option for travel—and expenditures for vehicles, including fuel, insurance, and maintenance, can be large and unpredictable. As a result, household transportation costs as a percentage of total income are higher than average for these communities (Pew Charitable Trusts 2016).

States can use policy levers in a number of ways to ensure fair and equitable access to public transportation and newer shared-use services. Providing incentives to developers who set aside a fixed percentage of low-income housing in transit-served areas helps align housing and transportation choices. Similarly, proximity to transit services is a key measure that many states use in disbursing federal low-income tax credits to qualifying property owners, ensuring that low-income communities are served by a variety of transportation alternatives.

Chapter 4. Building Energy Efficiency Policies

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INTRODUCTION

Buildings consume 75% of the electricity and 40% of the total energy used in the United States and account for 36% of all U.S. carbon dioxide emissions (EIA 2020c).[45] This makes buildings an essential target for energy savings. Because buildings have long life spans and retrofits are often complex or costly, encouraging building efficiency measures during design and construction is one of the most effective ways to reduce building energy consumption. Mandatory building energy codes require a minimum level of energy efficiency for new residential and commercial buildings as well as major alterations and additions. Benchmarking and transparency policies also promote efficiency by informing building owners about their energy consumption. Policies encouraging energy rating and labeling of homes can help to further transform the market by enabling prospective buyers to make informed decisions about the true long-term energy costs they would be taking on.

Building Energy Code Adoption

In 1974 Oregon adopted the first statewide energy code in the United States, followed in 1978 by California's Title 24 Building Standard. Several states (including Florida, New York, Minnesota, and Washington) followed with their own codes in the 1980s. During the 1980s and 1990s, the International Code Council® (ICC) and the regional code development organizations that preceded it developed the Model Energy Code (MEC), later renamed the International Energy Conservation Code® (IECC). Today most states use a version of the IECC for their residential buildings.

Most commercial building codes are based on ASHRAE 90.1 standards, jointly developed by ASHRAE (formerly the American Society of Heating, Refrigerating and Air-Conditioning Engineers) and the Illuminating Engineering Society (IES). The IECC commercial building code tends to adopt many of the prescriptive and performance requirements of the ASHRAE 90.1 code to ensure continuity between the two codes.

With the publication of each new edition of the IECC and ASHRAE standards, DOE issues determinations on the codes that ascertain their relative impact compared with older standards and establish, if justified, the latest iteration as the base code that all states must comply with. Within two years of the final determination, states are required to send letters either certifying their adoption, requesting an extension, or explaining their decision not to comply.[46] Some states, such as Maryland, Massachusetts, and Illinois, are required by statute to adopt the most recent version of the IECC within 12–18 months of publication.

In 2019 the ICC undertook the process of updating a number of its codes, including the 2021 residential and commercial IECC. Early in 2019, the ICC solicited proposal changes from the public, and in the summer and fall of 2019 it held hearings on these potential updates to the IECC for the 2021 version. The ICC held an online vote among its members in November

[45] From an analysis of 2018 totals from residential, commercial, industrial, and transportation end uses.

[46] Federal statute requirements are relatively weak, which helps explain why code adoption across different states is so varied.

and released the results in December 2019. Voting results showed the ICC membership overwhelmingly supported energy-efficient updates to the code.

The residential code will include a new flexible savings mechanism. This provision will allow builders to choose energy efficiency upgrades that work best for them to reduce energy use by 5%, with improvements ranging from better insulation to more efficient air conditioners and water heaters. In addition, an optional zero-energy appendix will provide a simple pathway for leading cities and states to require much higher levels of performance than in the standard IECC. Local governments also overwhelmingly voted to include provisions for electric vehicle and electric appliance readiness as well as increased water heater efficiency, though these were unfortunately removed by the ICC Board of Directors upon appeal (ICC 2020). However, they may still be able to adopt these proposals as amendments to their state or local code.

The code is expected to be released in early 2021 and will be available for immediate adoption by cities and states. ACEEE and other advocacy groups conservatively estimate that the code will improve energy efficiency by 10% over the 2018 IECC (ACEEE 2020a). However, a DOE determination will provide a more accurate estimate.

Additionally, in October 2019, ASHRAE released its updated 90.1-2019 commercial building code. The latest version of 90.1 includes new provisions to improve envelope efficiency, reduce air leakage, increase lighting controls, and improve pump efficiency. Preliminary estimates are that the 2019 code is 5% more energy efficient than the 2016 version; however, a DOE determination will provide a more accurate estimate. Determinations are typically released one to two years following the publication of a code.

A number of states have adopted the latest available version of the residential code, the 2018 IECC, including Delaware, New Mexico, Vermont, New York, Nebraska, New Jersey, Illinois, Massachusetts, Maryland, and Nevada. Meanwhile Colorado, a home-rule state, passed HB 19-1260, requiring local jurisdictions to adopt one of the three most recent versions of the IECC. The majority of these states have adopted ASHRAE 90.1-2016 (or equivalent); however, with 90.1-2019 published at the end of 2019, some states are expected to begin reviewing and adopting this code.

Early building energy codes used a prescriptive approach, requiring compliance with a specific portfolio of building specifications and efficiency measures. However, over the past two decades, performance-based compliance options have been incorporated into codes, allowing builders flexibility to chart their own course as long as the building meets a minimum standard of modeled energy performance. For residential buildings, an additional type of performance path called the Energy Rating Index was introduced in the 2015 IECC. This path involves target scores in a range of 0 to 100, where 100 represents the 2006 IECC and 0 represents a zero-energy building. The required score differs among climate zones.

At the same time, a number of states and communities have taken steps to move toward zero-energy standards for new and existing construction. A zero-energy building (ZEB) is one that produces at least as much energy as it uses, usually measured over the course of a year. This performance is achieved through energy efficiency and renewable energy technologies.

In recent years, the concept of zero energy (ZE) has increasingly taken hold among building designers and clean energy communities, prompting a growing pursuit of ZE-related targets and certifications, such as the American Institute of Architects' 2030 Challenge, the International Living Future Institute's Living Building Challenge, LEED Zero, and DOE's Zero Energy Ready Home program. States and localities have also developed more stringent building energy codes. Examples include the District of Columbia's zero-energy building code path, Oregon's executive order that requires zero-energy-ready home equivalence by 2023 (Oregon Office of the Governor 2017), Washington State's goal for a 70% reduction in energy consumption in new residential and construction by 2030, and city- and county-led efforts in Idaho and Colorado. Beyond mandating that all new homes be superefficient, California also requires rooftop PV for new construction. For the past decade the emphasis has been on advancing zero-net-energy buildings. The state is now pivoting to code requirements for low-GHG buildings, using metrics that will focus design and construction on decarbonization and demand flexibility to integrate with California's evolving clean energy grid (CEC 2020). Other active ZE plans are in place in Vermont, Rhode Island, the District of Columbia, New York, and Massachusetts. As building energy codes are amended to deepen energy savings and move states closer to ZE goals, interest is growing regarding outcome-based codes and the importance of calculating building energy savings.[47]

Building Energy Code Compliance

Robust implementation and enforcement are necessary to ensure that states will reap the benefits of adopted codes. A support network that includes DOE, the Pacific Northwest National Laboratory (PNNL), regional energy efficiency organizations (REEOs), and a variety of other local, regional, and national stakeholder groups provides technical training, educational resources, and advocacy to help states and communities reach their compliance goals.

DOE provides many resources to guide states in code compliance. In addition to funding compliance activities through grants, the agency provides technical assistance—such as model code adoption policies, compliance software, and training modules—through its Building Energy Codes Program. DOE recently completed the third phase of its single-family residential field study, which evaluated the code compliance of more than 4,500 homes across 25 states. The study concluded that the buildings industry is generally doing a good job complying with building energy codes; however, significant savings were still being left on the table. The study also found that, in many cases, these errors could be corrected through targeted education and training programs (Williams 2019). Additionally, DOE has funded studies on low-rise multifamily and commercial building codes compliance that are currently ongoing (Landry 2019; Cheslak 2019).

REEOs work closely and collaboratively within their regions and with one another to coordinate code-related activities that support adoption and compliance. They include the Northeast Energy Efficiency Partnerships (NEEP), the Southeast Energy Efficiency Alliance (SEEA), the Midwest Energy Efficiency Alliance (MEEA), the South-Central Partnership for

[47] While the focus of building energy codes historically has been to design energy-efficient buildings, outcome-based codes attempt to consider building operation and methods to measure ongoing energy use.

Energy Efficiency as a Resource (SPEER), the Southwest Energy Efficiency Project (SWEEP), and the Northwest Energy Efficiency Alliance (NEEA).[48] REEOs have played a vital role in helping to inform code adoption efforts, providing technical assistance, policy best practices, and analysis regarding cost effectiveness and potential energy savings of energy codes. Other pivotal REEO-led initiatives include increasing access to energy code training for builders, code officials, and architects and overseeing energy code stakeholder groups and collaboratives. The REEOs have also been key contributors to DOE's ongoing residential energy code field studies in Tennessee, Colorado, Arizona, Utah, Nevada, and many other states.

Other important stakeholders providing leadership and technical expertise on code adoption and enforcement include the National Association of State Energy Officials (NASEO) and the Responsible Energy Codes Alliance (RECA), among others.

In addition to participating in these regional and national efforts, states can take other actions to support code compliance. These include the following:

- Conducting a study—preferably every three to five years—to determine actual rates of energy code compliance, identify compliance patterns, and create protocols for measuring compliance and developing best-practice training programs
- Establishing a system, including programs and an evaluation methodology, that encourages utilities and other stakeholders to support code compliance and claim energy savings from doing so
- Offering training programs and/or adopting policies establishing minimum certification requirements for code enforcement officials, in order to increase the number and effectiveness of contractors and officials who implement codes and monitor and evaluate compliance. These programs and policies are most effective when based on data collected in compliance field studies. It is worth noting that professionals' participation in state-specific licensing, certification, and continuing education credit programs has been shown to be higher than their participation in national programs.

Utilities can promote compliance with state and local building codes in a number of ways. Many utilities across the country offer energy efficiency programs that target new construction. A handful of jurisdictions with EERS policies, including California, Massachusetts, Rhode Island, the District of Columbia, New York, and Arizona, have established programs that allow utilities to claim savings for code enhancement activities both for adoption and for compliance. Utilities can fund and administer training and certification programs, assist local jurisdictions with implementing tools that streamline enforcement, provide funding for purchasing diagnostic equipment, and help with compliance evaluation. For instance, Ameren Missouri offers a robust Residential Energy Code Support program for home builders, code officials, and other professionals. Utilities also can combine code compliance efforts with initiatives to improve energy efficiency beyond code requirements. To encourage utilities to participate, prudent regulatory

[48] These organizations cover all states except California, Hawaii, and Alaska.

mechanisms, such as program cost recovery or shared savings policies, must be in place to compensate them for their efforts.

Building Energy Use Transparency, Energy Performance Standards, and Home Energy Labeling

A significant challenge to improving efficiency in the housing sector has been a relatively low level of awareness and understanding among home buyers of the energy costs and energy-saving features of homes on the market. While miles-per-gallon stickers and Energy Guide labels have become dependable fixtures of the vehicle and home appliance markets, a lack of transparent energy use information has historically plagued the housing sector. Market signals are insufficient to direct consumers to the most efficient homes, leading to uninformed purchasing decisions and saddling home buyers with higher long-term costs than they had anticipated. This critical information gap has far-reaching ramifications that include not just bloated utility bills, but also the undervaluation of efficiency services, a concealment of vital knowledge about a home's maintenance and repair needs, and an excessive energy burden that may cause homeowners to forgo other important purchases.

Efficiency advocates and government agencies at all levels have worked to devise residential energy labeling programs and policies that inform home buyers and real estate stakeholders about a home's energy performance. Given differences in priorities among regions and stakeholders, a diverse patchwork of ratings with varying metrics and areas of focus has arisen to meet the challenge. Examples include:

- *Residential Energy Services Network (RESNET) Home Energy Rating System (HERS).*[49] Considered the industry standard, the HERS rating is required for a home to qualify for ENERGY STAR® certification, DOE Zero Energy Ready Home certification, and many energy efficiency programs that target new construction (Cluett and Amann 2013). ANSI/RESNET/ICC Standard 301-2014, known as the Energy Rating Index, is based on the HERS rating system; it is formally referenced as its own compliance path in the 2015, 2018, and 2021 IECC. The HERS allows builders flexibility in meeting code requirements and provides home sellers an opportunity to demonstrate the added energy-saving value of the home by including the score in real estate listings.
- *DOE Home Energy Score (HES).* Launched in 2012, HES has been used primarily for existing homes. HES rates homes on a 1–10 scale, with 10 being the most efficient, and provides guidance on recommended upgrades and how the upgrades will improve the home's score. The score has been incorporated into voluntary labeling initiatives in states including Alabama, Colorado, Connecticut, Massachusetts, and Oregon.[50] Starting in 2018, HES became mandatory in Portland, Oregon, at the time a property is listed for sale, with scores posted to the Multiple Listing Service.
- *Minneapolis Home Energy Score.* Minneapolis developed its own 0-to-100 rating covering a home's attic and wall insulation, heating system, and windows to meet

[49] RESNET is a national not-for-profit standard-setting membership organization accredited by the American National Standards Institute (ANSI) as a standards development organization.

[50] Many communities are also considering incorporating HES into their climate action plans as a way to spur retrofits.

its mandatory disclosure ordinance. Energy disclosure reports are now required on homes at the time of sale (Hudson 2020).

To help consumers navigate the varied and sometimes confusing landscape of residential energy labeling protocols, a number of state energy offices have partnered with organizations like NASEO and NEEP to strengthen the regional consistency of energy rating practices. These efforts include:

- *Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS).* An initiative led by state energy offices and supported by DOE and private partners, EMPRESS aims to coordinate and harmonize the software platforms for DOE's HES and RESNET's HERS ratings as well as to foster voluntary use of residential energy data by real estate market stakeholders and others (NASEO 2020). States involved in EMPRESS include Rhode Island, Massachusetts, Missouri, Arkansas, and Oregon.
- *Home Energy Labeling Information eXchange (HELIX).* Led by NEEP and supported by DOE, the six New England states and New York have together developed a database to help bridge the energy information gap between home sellers and the market. The system auto-populates real estate listings with verified independent home energy information from home energy labels, such as HES and HERS, solar PV data, and other available energy data (NEEP 2019). As of 2019, HELIX was available for all states to use as a policy management tool and to connect to local branches of the Multiple Listing Service.
- *Home Energy Information Accelerator.* One of 13 Better Buildings Accelerators launched by DOE since 2013, the Home Energy Information Accelerator is a collaboration among national, regional, state, and local leaders aimed at expanding the availability and use of reliable home energy information in residential real estate transactions, such as through listing services and other reports. Other goals include providing data standards and technical assistance.

Mandates for residential home energy labeling are more common in local jurisdictions than at the state level. However, voluntary state programs in Connecticut, Massachusetts, and Vermont have found success through a variety of policy levers, such as piggybacking labels onto existing energy efficiency programs. This can help increase exposure to consumers and build a case for more widespread implementation through demonstration of the increased market value associated with improved energy transparency (Faesy et al. 2014). By convening stakeholders and real estate interests to share perspectives, challenges, and opportunities through a consistent governance structure, states can help craft a successful labeling program that integrates with regional listing services and has the support of both home buyers and home sellers.

On the commercial side, a growing number of jurisdictions, including more than 25 cities, have established building energy benchmarking and transparency laws (IMT 2020). These require property owners, builders, or sellers to compile information about their buildings' energy use or energy efficiency characteristics and report these data to a central database and/or to prospective buyers at the time of sale. This information can then be used to evaluate building energy use patterns and identify energy efficiency opportunities. Several studies have demonstrated that benchmarking and transparency policies can be associated

with a 3–8% reduction in energy consumption or energy use intensity (EPA 2012; Mims et al. 2017).[51] Energy use transparency requirements are a fairly recent policy innovation. Commercial transparency policies are uncommon at the state level, with only California, Washington, the District of Columbia, and New Jersey requiring energy use disclosure upon sale or lease. Local governments are more likely to pursue these policies, but state governments can also use them to incentivize building stock upgrades.

Additionally, cities and a few states are starting to require Building Energy Performance Standards (BEPS). These standards, typically based on commercial buildings' energy use intensity (EUI), help to capture the ongoing energy consumption of existing buildings. This can help ensure that buildings are being operated efficiently, and if not, can identify adjustments and investments to improve energy performance. While these requirements are more prevalent in cities (e.g., New York City; Boulder, Colorado; and St. Louis), both Washington, DC, and Washington State have set BEPS requirements to be met starting in 2026 (Nadel and Hinge 2020).

Cities, states, and other jurisdictions are increasingly supplementing energy consumption metrics with carbon and GHG emissions metrics. For instance, New York City recently passed the landmark Climate Mobilization Act, which requires buildings of more than 25,000 square feet to cut their carbon emissions by 40% from 2005 levels by 2030 and by more than 80% by 2050. This bill includes sizable fines for failure to meet the requirements (New York City Council 2019).

GHG reduction goals go hand in hand with energy efficiency. As more jurisdictions start considering these new metrics, ACEEE intends to investigate the best methods for incorporating them into the *State Scorecard*.

METHODOLOGY

Our review of state building energy code stringency is based predominantly on publicly available information, such as that provided by the DOE Building Energy Codes Program, New Buildings Institute (NBI), RECA, and the national network of REEOs. It draws as well on the expert knowledge of individuals who are active in state building energy code policy and evaluation. We also relied on primary data collection to verify publicly available data, particularly for very recent or forthcoming code adoptions. We distributed a data request to energy offices and knowledgeable officials in each state, soliciting information on their efforts to measure and enforce code compliance.

While model codes are determined at the national level, states often amend these codes during the adoption process, thereby affecting the EUI of buildings constructed to that code. To more accurately capture the energy savings impact of these amendments, ACEEE worked with NBI to score building energy code stringency according to the modeled EUI of

[51] A study by the EPA showed that benchmarking energy use led to a 7% decrease in consumption across a sample of more than 35,000 buildings (EPA 2012). A Lawrence Berkeley National Laboratory (LBNL) review of state and local benchmarking and transparency studies found that most of the research indicated a 3–8% reduction in gross energy consumption or energy use intensity over a two- to four-year period of building and transparency policy implementation. The LBNL review, however, suggested that additional research be conducted to confirm energy impacts and determine causal relationships (Mims et al. 2017).

each code as measured by NBI's Zero Energy Performance Index (zEPI). A zEPI score of zero indicates a zero-energy building.[52]

SCORING AND RESULTS

States earned credit for residential and commercial building energy codes on the basis of two measures: the stringency of the codes and the level of activity to support code compliance. We also awarded points for efforts to improve the transparency of building energy use. This included awarding points for benchmarking and energy use transparency laws. Further, we continued to use a metric introduced in 2018 that tracks the number of home energy labels distributed annually as a percentage of new home construction, based on information received through our annual data request and from publicly available data from RESNET. We awarded points as follows:

- Code stringency
  - Residential energy code (2 points)
  - Commercial energy code (2 points)
- Code compliance
  - Compliance study (1 point)
  - Other compliance activities (1 point)
- Building energy use transparency
  - Residential and/or commercial benchmarking/transparency policies (1 point)
  - Existing building performance standards (1 point)
  - Zero-energy buildings (0.5 points)
  - Energy rating and labeling of homes (0.5 points)

As in past *Scorecards*, states could earn a maximum of 4 points for stringency. We also added metrics to recognize progress in two emerging areas: the adoption of building energy performance standards for existing buildings (so far only Washington State and the District of Columbia) and efforts to advance construction of ZEBs, which we measured using data on verified and emerging ZEBs from the New Buildings Institute. To accommodate these changes, we removed a previous metric that credited states for requiring code officials to complete energy efficiency–related training and certification.

Table 24 lists states' overall building energy code scores. Explanations of each metric follow.

[52] The zEPI system is based on a scale presented in a paper by Charles Eley, an energy efficiency advocate and New Buildings Institute fellow. The scale establishes zero-net energy as the absolute goal and enables the measurement of a building's progress toward zero-net energy performance, as opposed to the traditional percentage-better-than-code metric. To learn more about this scale, see Eley (2009). To learn more about the zEPI methodology, see newbuildings.org/code_policy/zepi/.

Table 24. State scores for building energy efficiency policies

State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
District of Columbia	2	2	1	1	1	0	1	0.5	8.5
California	2	2	1	1	1	0	0	0.5	7.5
Washington	2	2	1	1	0.5	0	1	0	7.5
Hawaii	2	2	1	1	0.5	0	0	0.5	7
Massachusetts	2	2	1	1	0	0.5	0	0.5	7
Oregon	2	2	1	1	0	0.5	0	0.5	7
Connecticut	2	2	1	1	0	0.5	0	0	6.5
Michigan	2	2	1	1	0	0.5	0	0	6.5
Minnesota	2	2	1	1	0	0.5	0	0	6.5
Nevada	2	2	1	0.5	0	0.5	0	0.5	6.5
New Jersey	1.5	2	1	1	0.5	0.5	0	0	6.5
New York	2	2	1	1	0.5	0	0	0	6.5
Pennsylvania	2	2	1	1	0	0.5	0	0	6.5
Texas	2	2	1	1	0	0.5	0	0	6.5
Colorado	1.5	1.5	1	1	0	0.5	0	0.5	6
Florida	1.5	2	1	1	0	0.5	0	0	6
Illinois	2	2	1	1	0	0	0	0	6
Maryland	2	2	1	0.5	0	0.5	0	0	6
Nebraska	2	2	1	1	0	0	0	0	6
Rhode Island	1.5	2	1	1	0	0.5	0	0	6

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State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
Utah	1.5	2	1	1	0	0	0	0.5	6
Vermont	2	2	1	0.5	0	0	0	0.5	6
Alabama	1.5	2	1	1	0	0	0	0	5.5
Delaware	2	2	0	1	0	0.5	0	0	5.5
Idaho	1.5	2	1	1	0	0	0	0	5.5
Montana	2	1.5	1	1	0	0	0	0	5.5
New Hampshire	1.5	2	0	1	0	0.5	0	0.5	5.5
Virginia	1.5	2	1	0.5	0	0.5	0	0	5.5
Kentucky	1	1.5	1	0.5	0	0.5	0	0.5	5
North Carolina	1.5	2	1	0	0	0.5	0	0	5
Arizona	1	1	1	0.5	0	0.5	0	0.5	4.5
Georgia	1.5	2	1	0	0	0	0	0	4.5
Maine	1	1	0.5	1	0.5	0	0	0.5	4.5
New Mexico	2	2	0	0	0	0.5	0	0	4.5
Iowa	2	1.5	0	0	0	0.5	0	0	4
Missouri	1	1	1	1	0	0	0	0	4
West Virginia	1	2	1	0	0	0	0	0	4
Kansas	1	1	0	0.5	0.5	0.5	0	0	3.5
Ohio	1.5	1.5	0	0	0	0.5	0	0	3.5
South Dakota	1.5	1.5	0	0	0.5	0	0	0	3.5
Tennessee	1	1.5	1	0	0	0	0	0	3.5

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State	Residential code stringency (2 pts.)	Commercial code stringency (2 pts.)	Compliance study (1 pt.)	Additional compliance activities (1 pt.)	Benchmarking and transparency (1 pt.)	Energy rating and labeling of homes (0.5 pts.)	Existing building standards (1 pt.)	Zero-energy buildings (0.5 pts.)	Total score (9 pts.)
Arkansas	1	1	1	0	0	0	0	0	3
Indiana	1.5	1	0	0	0	0.5	0	0	3
North Dakota	1.5	1.5	0	0	0	0	0	0	3
Wisconsin	1	2	0	0	0	0	0	0	3
South Carolina	1	1	0	0	0	0.5	0	0	2.5
Louisiana	1	1	0	0	0	0	0	0	2
Alaska	1	0	0	0	0.5	0	0	0	1.5
Oklahoma	1	0	0	0	0	0.5	0	0	1.5
Mississippi	0	0	0	0.5	0	0	0	0	0.5
Wyoming	0	0	0	0	0	0	0	0	0

Sources: Stringency scores are derived from data request responses (Appendix A), New Buildings Institute analysis of PNNL data, and discussions with code experts as of August 2020. Compliance and enforcement scores are based on information gathered in surveys of state building energy code contacts. See the ACEEE State and Local Policy Database for more information on state codes and compliance (ACEEE 2020b).

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DISCUSSION

Stringency

We assigned each state 0 to 2 points for residential building energy codes and another 0 to 2 points for commercial building energy codes, with 2 being assigned to those with the lowest (i.e., most efficient) scores as measured by NBI's zEPI scale. We grouped the zEPI code impact scores into awarded point values generally according to their alignment with similar corresponding model codes.[53] For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database. The zEPI Jurisdictional Score uses data from PNNL, calculating expected energy use intensity in kBtus per square foot by accounting for building type and distribution and regional climate zones for each state.[54] The zEPI scale sets the zero value at zero energy consumption, with a baseline roughly equivalent to the average building in the year 2000. Minor credits are awarded for stretch code adoption in local jurisdictions, which has the effect of improving the overall performance level of mandatory energy code adoptions within a state base.

Table 25 summarizes our scoring methodology for code stringency. Lower zEPI scores indicate lower projected energy use intensity owing to more stringent building energy codes. Residential zEPI scores between 49.1 and 57.2 earned the maximum of 2 points; these generally correspond with states that have adopted codes aligned with the 2015 or 2018 IECC. Scores between 57.3 and 66.0 earned 1.5 points, generally reflecting states that have adopted the 2012 IECC. Scores between 66.1 and 73.0 earned 1 point and align roughly with those states that have adopted codes matching the 2009 IECC. We applied a similar approach to point distributions for commercial buildings. However, state-specific amendments strengthening or weakening certain sections of a code—such as adjusting the number of air changes allowed per hour, or altering the amount of insulation required—can positively or negatively impact a state's zEPI value, and in turn its score.

Some home-rule states that have no mandatory state code and adopt building energy codes at the local level lacked sufficient data to allow calculation of a zEPI value.[55] These states could still earn points if they demonstrated a significant percentage of local adoption of a particular code, though the score assigned is a half-point less compared to that awarded for statewide adoption of a given code. Within Arizona, for example, more than 60% of new construction occurs in jurisdictions that have enacted the 2012 IECC or better, according to

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[53] We have not developed a quantitative method for comparing the interstate impact of jurisdictional code adoptions in home-rule states, in part because of a lack of consistent data across states. We recognize that our methodology is imperfect, and we do not intend to dismiss this local progress by assigning a lower score to these states.

[54] PNNL conducts state-level technical analysis based on a methodology established by DOE. PNNL reviews state energy codes based on the IECC and Standard 90.1, including any significant amendments. This helps states understand how their codes compare with the national model codes and provides a portrait of national code adoption. A quantitative analysis is performed to assess the energy savings impacts within a given state. The calculated EUI of buildings constructed to a particular state code is compared with the energy use of the model energy code. This comparison allows a categorization of each state, with categories based on recent editions of the model codes.

[55] Home-rule decentralizes power, allowing localities to exercise certain prerogatives of governance within their own administrative area. See database.aceee.org for more information on building codes in home-rule states.

SWEEP. For detailed information on building code stringency in each state, visit ACEEE's State and Local Policy Database.

Table 25. Scoring of state residential and commercial building energy code stringency

Residential zEPI score	Score (2 pts.)	Commercial zEPI score	Score (2 pts.)
49.1–57.2	2	48.0–55.7	2
57.3–66.0 or adoption of 2015/2018 IECC in major jurisdictions	1.5	55.8–65.6 or adoption of 2015/2018 IECC or ASHRAE 90.1-2013/2016 in major jurisdictions	1.5
66.1–73.0 or adoption of 2012 IECC in major jurisdictions	1	65.7–70.0 or adoption of 2012 IECC or ASHRAE 90.1-2010 in major jurisdictions	1
Adoption of 2009 IECC or equivalent in major jurisdictions	0.5	Adoption of 2009 IECC or ASHRAE 90.1-2007 in major jurisdictions	0.5

Table 26 shows state-by-state scores for this category. We should note that some states have adopted more efficient codes in recent months, too late to have new zEPI scores calculated in time for *Scorecard* publication. We note these states with an asterisk and award them points based on the anticipated zEPI score generally corresponding with the adopted title code.

Table 26. State scores for code stringency

State	zEPI score	Score	Residential code
CA	Custom	2	*2019 Building Energy Efficiency Standards**
DC		2	*2015 IECC**
DE		2	*2018 IECC**
NE		2	*2018 IECC**
NM		2	*IECC 2018 with amendments**
VT		2	*2018 IECC**
WA	Custom	2	*2018 WA State Energy Code (exceeds 2018 IECC)**
MN	49.1	2	IECC 2012 with amendments
NY	49.7	2	IECC 2018 with amendments
MA	49.8	2	IECC 2015 with amendments
MI	50.3	2	IECC 2015 with amendments
MD	52.6	2	IECC 2018 with amendments
NV	53.6	2	IECC 2018 with amendments
CT	53.7	2	IECC 2015 with amendments
IA	54.2	2	IECC 2012 with amendments
MT	54.4	2	IECC 2012 with amendments
IL	54.4	2	IECC 2018 with amendments
OR	55.0	2	IECC 2018 with amendments
PA	56.8	2	IECC 2015 with amendments
TX	57.1	2	IECC 2015
AL	57.5	1.5	IECC 2015 with amendments
IN	58.6	1.5	IECC 2018 with amendments
GA	58.7	1.5	IECC 2015 with amendments
OH	59.7	1.5	IECC 2018 with amendments
NC	60.0	1.5	IECC 2015 with amendments
NJ	60.9	1.5	IECC 2018 with amendments
VA	61.0	1.5	IECC 2015 with amendments
NH	61.8	1.5	IECC 2015 with amendments
FL	62.6	1.5	IECC 2015 with amendments
ID	63.3	1.5	IECC 2012 with amendments
UT	63.6	1.5	IECC 2015 with amendments
RI	65.8	1.5	IECC 2015 with amendments
ME	66.4	1	IECC 2009
WI	66.5	1	IECC 2009 with amendments
OK	66.8	1	IECC 2009 with amendments
KY	67.4	1	IECC 2009
WV	67.9	1	IECC 2009
SC	68.6	1	IECC 2009
LA	68.9	1	IECC 2009
AR	72.3	1	IECC 2009 with amendments
HI	~~Home Rule~~	2	2015 IECC
CO	~~Home Rule~~	1.5	Significant adoption of 2015/2018 IECC
ND	~~Home Rule~~	1.5	Significant local adoption of 2015 IECC
SD	~~Home Rule~~	1.5	Significant local adoption of 2015 IECC
AK		1	Most new construction follows 2012 IECC
AZ	~~Home Rule~~	1	Significant local adoption of 2012 IECC
KS	~~Home Rule~~	1	Significant adoption of 2009/2012 IECC
MO	~~Home Rule~~	1	Significant adoption of 2009/2012 IECC
TN		1	Significant adoption of 2009 IECC or above
MS	Home Rule	0	None statewide
WY	~~Home Rule~~	0	No mandatory code

State	zEPI score	Score	Commercial code
CA	Custom	2	*2019 Building Energy Efficiency Standards**
DC		2	*2015 IECC and ASHRAE 90.1 2013**
DE		2	*2018 IECC and ASHRAE 90.1 2016**
NE		2	*2018 IECC and 90.1-2016*
NM		2	*2018 IECC and 90.1-2016^**
VT		2	*2018 IECC and ASHRAE 90.1 2016**
WA	Custom	2	*2015 WA State Energy Code (ASHRAE 90.1-2016)**
NJ	48.0	2	90.1-2016
MA	48.0	2	2015 IECC and 90.1-2013^
IL	49.3	2	2018 IECC and 90.1-2016
MD	49.5	2	2018 IECC and 90.1-2016
PA	49.5	2	2015 IECC and 90.1-2013
MI	49.5	2	2015 IECC and 90.1.2013^
NY	50.2	2	2018 IECC and 90.1-2016^
CT	50.3	2	2015 IECC and 90.1-2013
NH	50.7	2	2015 IECC and 90.1-2013
TX	51.0	2	2015 IECC and 90.1-2013
AL	51.5	2	90.1-2013
GA	51.8	2	2015 IECC and 90.1-2013^
OR	51.8	2	90.1-2016
UT	51.8	2	2018 IECC and 90.1-2016
ID	52.5	2	2015 IECC and 90.1-2013
FL	52.5	2	2015 IECC and 90.1-2013^
MN	52.5	2	2018 IECC and 90.1-2016^
RI	52.5	2	2015 IECC^
VA	52.5	2	2015 IECC and 90.1-2013
WI	52.5	2	2015 IECC and 90.1-2013^
NV	53.0	2	Significant local adoption of 2018 IECC
WV	54.5	2	90.1-2010
NC	54.8	2	2015 IECC and 90.1-2013^
KY	60.8	1.5	2012 IECC and 90.1-2010
IA	61.2	1.5	2012 IECC and 90.1-2010
OH	63.0	1.5	2012 IECC and 90.1-2010
MT	64.2	1.5	2012 IECC and 90.1-2010
IN	69.0	1	90.1-2007
ME	69.0	1	2009 IECC and 90.1-2007
LA	69.4	1	90.1-2007
AR	69.8	1	2009 IECC and 90.1-2007
SC	69.8	1	2009 IECC and 90.1-2007
OK	79.1	0	2006 IECC and 90.1-2004
HI	~~Home Rule~~	2	2015 IECC
CO	~~Home Rule~~	1.5	Significant local adoption of 2012/2015 IECC
ND	~~Home Rule~~	1.5	Significant local adoption of 2015 IECC
SD	~~Home Rule~~	1.5	Significant local adoption of 2015 IECC
TN		1.5	Significant local adoption of 2012/2015 IECC
AZ	~~Home Rule~~	1	Significant local adoption of the 2012 IECC
KS	~~Home Rule~~	1	Significant adoption of 2009/2012 IECC
MO	~~Home Rule~~	1	Significant adoption of 2009/2012 IECC
AK		0	No mandatory code
MS		0	None statewide
WY	~~Home Rule~~	0	Significant adoption of IECC 2006 or equivalent

* These states have signed or passed legislation requiring compliance with a new iteration of codes effective by October 1, 2020, but zEPI calculations had not yet been made available when this *Scorecard* was being prepared. We award these states full credit commensurate with the average zEPI score of states that enforce a similar title code. ^ When an amendment's impact on energy efficiency could be quantified using DOE Prototype Building Models, this was captured in the analysis.

Some states regularly adopt the latest iterations of the IECC and ASHRAE 90.1 code standards as they are determined. However, other states have recently considered statutory or regulatory requirements to extend code adoption cycles. States unable to adopt the latest building energy codes will miss out on significant energy savings opportunities. ACEEE considered removing points from states with extended code adoption cycles, but most states do not actually update building codes every three years (Athalye et al. 2016). We therefore decided not to penalize those with extended cycles.

The *2019 State Scorecard* highlighted a variety of states that had recently updated to the 2018 IECC, including Nebraska, Ohio, Maryland, Illinois, and Massachusetts. Since then, a number of states have joined them in adopting the new codes, including Delaware, New Mexico, Vermont, New York, and New Jersey. While 10 states lack mandatory statewide energy codes for new residential and/or commercial construction (Alaska, Arizona, Colorado, Kansas, Mississippi, Missouri, Nevada, North Dakota, South Dakota, and Wyoming), some of these home-rule states are nonetheless showing high rates of adoption at the jurisdictional level. We awarded points to these states accordingly.

Compliance

It is difficult to score states in this area because consistent data on actual compliance rates are lacking, and other compliance metrics are largely qualitative. Still, we continue to seek ways to score states in a manner that reflects tangible improvements in energy savings.

In 2015 we updated our scoring methodology to award more credit to states that had completed compliance studies in recent years. The reasoning was that, as the 2017 deadline under the American Recovery and Reinvestment Act (ARRA) approached for states to demonstrate 90% compliance with 2009 IECC and ASHRAE 90.1-2007 codes, compliance rates should reflect a state's code enforcement efforts. Although we have used the same methodology this year, ACEEE will continue to revisit this metric to determine how it might be improved to equitably score states on the basis of actual levels of compliance reported. For more information on state compliance efforts, visit ACEEE's State and Local Policy Database (ACEEE 2020b).

Table 27 shows our scoring methodology for assessing state compliance studies.

Table 27. Scoring of state efforts to assess compliance

Compliance study	Score (1 pt.)
Compliance study has been completed in the past five years, follows standardized protocols, and includes a statistically significant sample.	1
Compliance study has been completed in the past five years but does not follow standardized protocols or is not statistically significant.	0.5
No compliance study has been completed in the past five years.	0

Table 28 shows our scoring methodology for additional activities to improve and enforce energy code compliance. A state could earn 0.5 points for each compliance strategy it engaged in during the past year, up to a total of 1 point.

Table 28. Scoring of efforts to improve and enforce code compliance

Additional metrics for state compliance efforts	Score (1 pt.)
Stakeholder advisory group or compliance collaborative	0.5
Utility involvement	0.5

Several states have completed compliance studies demonstrating 90% or higher compliance rates for residential and/or commercial buildings. It could well be argued that states demonstrating compliance rates approaching 100% should receive full credit within the above metrics regardless of whether they engage in additional strategies to enforce compliance. However, we believe the current methodology is valid in the near term for several reasons. First, while we plan to award more points in the future to states on the basis of their compliance studies' results, we also want to recognize the enormous value in a state's maintaining a robust policy framework. Such a framework can support ongoing efforts to provide training and education to staff, actively monitor code changes, and make up-to-date information available to stakeholders through strong coordination. Second, we want to avoid inadvertently penalizing states with lower compliance rates under newer or more stringent codes; this would work against the *Scorecard*'s goal of rewarding states operating at the leading edge of energy efficiency.

As we look ahead to future *Scorecards*, we plan to address these important methodological questions as well as others—including how best to compare the results of compliance studies conducted using differing methodologies (e.g., prescriptive versus performance-based) and how to update our data request accordingly.

Table 29 shows how states scored for each compliance metric. Details on state activities in these areas are given in the ACEEE State and Local Policy Database (ACEEE 2020b).

Table 29. State scores for energy code compliance efforts

State	Compliance study (1 pt.)	Stakeholder group (0.5 pts.)	Utility involvement (0.5 pts.)	Total score (2 pts.)
California	•	•	•	2
Connecticut	•	•	•	2
Massachusetts	•	•	•	2
Oregon	•	•	•	2
Pennsylvania	•	•	•	2
Texas	•	•	•	2
Alabama	•	•	•	2
Colorado	•	•	•	2
District of Columbia	•	•	•	2
Florida	•	•	•	2
Hawaii	•	•	•	2
Idaho	•	•	•	2
Illinois	•	•	•	2
Michigan	•	•	•	2
Minnesota	•	•	•	2
Missouri	•	•	•	2
Montana	•	•	•	2
Nebraska	•	•	•	2
New Jersey	•	•	•	2
New York	•	•	•	2
Rhode Island	•	•	•	2
Utah	•	•	•	2
Washington	•	•	•	2
Vermont	•		•	1.5
Kentucky	•	•		1.5
Maryland	•	•		1.5
Virginia	•	•		1.5
Arizona	•		•	1
Arkansas	•			1
Delaware		•	•	1
Georgia	•			1
Nevada	•	•		1
New Hampshire		•	•	1
North Carolina	•			1
Tennessee	•			1

State	Compliance study (1 pt.)	Stakeholder group (0.5 pts.)	Utility involvement (0.5 pts.)	Total score (2 pts.)
West Virginia	●			1
Kansas		●		0.5
Maine	○			0.5
Mississippi		●		0.5
Alaska				0
Indiana				0
Iowa				0
Louisiana				0
New Mexico				0
North Dakota				0
Ohio				0
Oklahoma				0
South Carolina				0
South Dakota				0
Wisconsin				0
Wyoming				0

An unfilled circle indicates a state receiving half credit for compliance studies, meaning that the compliance study either does not follow the PNNL methodology or does not use a significant sample size. Data are from state responses to data requests (see Appendix A). See State and Local Policy Database (ACEEE 2020c) for more details on each activity.

While 13 states scored zero, according to our survey results, almost every state in the country makes some effort to support code compliance, whether a statewide code is mandatory or not, usually by sponsoring or supporting training resources for local code officials. Nearly every state that responded uses at least one of the strategies for boosting compliance discussed above, and a growing number use many or all of them. For states that did not respond or provided partial responses to this year's survey, we referred to last year's data to complement information in some cases. States that received zero points for compliance are those that did not respond to our survey or could not report compliance activities.

Benchmarking and Energy Transparency Requirements

States with mandatory energy use benchmarking and transparency laws received 0.5 points for a policy covering either commercial or residential buildings. States with those policies in place for some or all of their commercial *and* residential buildings received 1 point. Table 30 presents states' disclosure policies.

Table 30. State benchmarking and energy transparency policies

State	Disclosure type	Building energy use transparency requirements	Score (1 pt.)
California	Commercial, residential multifamily	AB 1103 required nonresidential building owners or operators to benchmark their buildings' energy use with ENERGY STAR Portfolio Manager and to disclose this information to buyers, lenders, and lessees. AB 802 replaces this legislation and expands the requirement to any building with five or more active utility accounts, including residential multifamily buildings.	1
District of Columbia	Commercial, residential multifamily	The Clean and Affordable Energy Act of 2008 requires privately owned commercial buildings to be benchmarked annually using ENERGY STAR Portfolio Manager. Results are publicly available in the BuildSmart DC database. The Clean Energy DC Omnibus Amendment Act of 2018 lowered the building floor area threshold and set new requirements for third-party verification every three years.	1
Alaska	Residential	Alaska statute AS.34.70.101 requires the release of utility data for residential buildings at the time of sale.	0.5
Hawaii	Residential	§508D-10.5 requires residential property owners to disclose energy efficiency consumer information at the time of sale or lease.	0.5
Kansas	Residential	HB 2036 requires builders or sellers of new residential single-family homes or multifamily buildings of four units or fewer to disclose information regarding the energy efficiency of the structure to prospective buyers prior to the signing of a purchase contract.	0.5
Maine	Residential rental	HP 1468 requires the disclosure of an energy efficiency checklist upon request by tenant or lessee and allows for the release of audit information on residential rental properties, both at the time of rental.	0.5
New Jersey	Commercial	AB A3723 (2018) establishes that within five years of enactment, the owner or operator of any commercial building larger than 25,000 square feet must benchmark energy and water use with the ENERGY STAR Portfolio Manager tool.	0.5
New York	Residential	Since 1981, the Truth in Heating law has required the release of residential buildings' utility data upon request by prospective purchasers at the time of sale.	0.5
South Dakota	Residential	SB 64 (2009) established certain energy efficiency disclosure requirements for new residential buildings at the time of sale.	0.5
Washington	Commercial	SB 5854 (2009–10) requires owners of nonresidential buildings larger than 10,000 square feet and qualifying public agency buildings to benchmark their buildings' energy use with ENERGY STAR Portfolio Manager and to disclose this information to buyers, lenders, and lessees.	0.5

Policy information is based on responses to data requests from state energy offices.

Several states have taken the lead in requiring benchmarking and energy use transparency. The most recent is New Jersey, which passed significant renewable energy legislation in

2018 that included requirements for the owners of commercial buildings larger than 25,000 square feet to benchmark energy and water use using the ENERGY STAR Portfolio Manager tool. The District of Columbia and California are the only jurisdictions we surveyed that have such requirements for both the commercial and residential multifamily sectors. As benchmarking and energy use transparency policies become more common, more states will probably expand their scope to target more buildings across both markets. However, local jurisdictions are more likely to pursue these policies. Most recently, Kansas City and St. Louis, Missouri; Portland, Oregon; and Reno, Nevada, adopted benchmarking ordinances.[56]

Residential Energy Labeling

Last year we added a new 0.5-point metric to recognize state efforts to make visible the energy consumption and efficiency of homes through issuance or support of residential energy labeling initiatives. While the benchmarking metric is based on the existence of a state policy, the labeling metric is a quantitative measure of how many homes are rated. As mentioned, a variety of energy rating protocols exists, with some state-specific labels having been uniquely adapted from DOE's Home Energy Score. In order to compare states, we used publicly available 2019 RESNET HERS ratings figures as a foundational data set and supplemented it with additional state-provided labeling records gathered through ACEEE's data request to state energy offices (RESNET 2020). We then calculated the number of ratings issued as a percentage of total building permits for residential and multifamily new construction as reported by the U.S. Census Bureau. We awarded 0.5 points to states in which this percentage was equal to or higher than the median of all states. Table 31 shows the results of this analysis.

Table 31. Residential energy labeling efforts (2019)

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Oregon[1]	11,018	22,037	50.00%	0.5
Massachusetts	8,348	17,365	48.07%	0.5
Maryland	8,658	18,491	46.82%	0.5
Indiana	10,294	22,309	46.14%	0.5
Arizona	20,298	46,580	43.58%	0.5
New Mexico	2,082	5,020	41.47%	0.5
Colorado	14,385	38,633	37.24%	0.5
Nevada	7,398	20,143	36.73%	0.5
Oklahoma	4,446	12,152	36.59%	0.5
Ohio	7,609	23,047	33.02%	0.5
Rhode Island	455	1,400	32.50%	0.5

[56] For more information on how municipalities are encouraging building energy disclosure, see Ribeiro et al. (2015) and Cluett and Amann (2013).

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Iowa	3,378	11,870	28.46%	0.5
Delaware	1,766	6,539	27.01%	0.5
South Carolina	9,412	36,034	26.12%	0.5
Minnesota	7,287	28,586	25.49%	0.5
North Carolina	16,849	71,307	23.63%	0.5
Texas	45,096	209,895	21.49%	0.5
Virginia	6,947	32,418	21.43%	0.5
Kansas	1,520	7,961	19.09%	0.5
Connecticut	1,105	5,854	18.88%	0.5
Michigan	3,665	20,600	17.79%	0.5
Pennsylvania	4,164	23,539	17.69%	0.5
Kentucky	2,005	11,811	16.98%	0.5
New Hampshire	742	4,743	15.64%	0.5
New Jersey	4,990	36,505	13.67%	0.5
Florida	21,090	154,302	13.67%	0.5
Alabama	2,331	17,748	13.13%	0
Idaho	2,121	17,716	11.97%	0
Georgia	5,988	53,823	11.13%	0
Illinois	2,275	20,524	11.08%	0
New York	4,474	45,219	9.89%	0
District of Columbia	528	5,945	8.88%	0
Wisconsin	1,466	17,480	8.39%	0
Utah	2,386	28,779	8.29%	0
Nebraska	581	8,025	7.24%	0
Vermont	126	1,801	7.00%	0
Wyoming	115	1,708	6.73%	0
Arkansas	591	12,723	4.65%	0
Hawaii	189	4,093	4.62%	0
Tennessee	1,840	41,361	4.45%	0
West Virginia	126	3,010	4.19%	0
Missouri[2]	583	17,460	3.34%	0
South Dakota	96	4,415	2.17%	0
Washington	902	48,424	1.86%	0

State	Home energy ratings issued*	New residential and multifamily building permits†	Home energy ratings as % of new construction	Score (0.5 pts.)‡
Louisiana	170	15,793	1.08%	0
California	848	110,197	0.77%	0
Maine	6	4,760	0.13%	0
Mississippi	3	6,952	0.04%	0
Montana	2	4,776	0.04%	0
Alaska[3]	0	1,680	0.00%	0
North Dakota	0	2,495	0.00%	0

* 2019 RESNET HERS ratings unless otherwise noted. † 2019 U.S. Census Bureau Building Permits Survey (Census Bureau 2020). ‡ Scores of 0.5 were awarded to states in which the number of ratings issued as a percentage of new construction was equal to or greater than the median, or 13.67%. [1] 7,800 Oregon Home Energy Scores supported by a state program and based on DOE's Home Energy Score; 3,045 Energy Trust of Oregon's Energy Performance Scores (EPS). EPS is a utility new homes program that evaluates homes built above code and offers incentives based on percentage above code as it is built. [2] Missouri Home Energy Certification takes into consideration both the HERS Index and the HES. A total of 3,247 Gold Certificates have been issued through the program. A home must achieve an 8 or greater on the HES, or a HERS Index score of 65 or lower to qualify. Figures for 2019 were not available. [3] AkWarm, the state-approved energy rating software, is used to model home energy requirements. More than 10,622 new homes have been constructed that meet or beat the applicable Alaska Building Energy Efficiency Standard. Figures for 2019 were not available.

Standards for Existing Buildings

Looking to the future, by 2050 roughly half of the nation's building stock will be buildings that are already standing today (Nadel 2019). While state policies often focus on improving new construction, states are also beginning to seek out ways to reduce energy consumption and carbon emissions in their stock of existing buildings. This is an important area of focus given that a building may be around for 30, 40, 50, or more years.

The two current examples of existing building standards are in the District of Columbia and Washington State. DC and Washington are both in the process of enacting requirements for commercial buildings 50,000 square feet and above to meet minimum performance standards. The standards require buildings to meet a minimum threshold—energy use intensity in Washington state and ENERGY STAR score (which is based on EUI) in DC. Both standards permit alternative compliance pathways for buildings unable to meet these thresholds, allowing them to show that they are taking sufficient steps to reduce energy consumption. Table 32 gives further details.

Table 32. Existing building standards

State	Existing building standard type	Requirements	Score (1 pt.)
District of Columbia	Commercial	The District's December 2018 Clean Energy DC Omnibus Act includes a provision to create Building Energy Performance Standards (BEPS). BEPS will require all existing buildings over 50,000 square feet to meet an energy efficiency threshold or to improve its performance by 2026. The threshold is based on an ENERGY STAR score. Alternative pathways will be available for buildings unable to meet the threshold.	1
Washington	Commercial	The state's 2019 House Bill 1257, Clean Buildings for Washington Act, set requirements for commercial buildings to meet performance targets. The Department of Commerce determines the targets using energy use intensity as a metric. Buildings over 50,000 square feet are required to comply, starting in 2026 with the largest buildings. An additional compliance pathway is available for buildings unable to meet the EUI, provided they have conducted an energy audit and invested in improvements.	1

Zero-Energy Building Deployment

Examples of zero-energy buildings, which generate at least as much energy as they consume (averaged out annually), keep increasing in number each year. With the growing interest in zero-energy and zero-carbon building design, we have included a new metric to account for states' commitment to developing zero-energy buildings.

The New Buildings Institute tracks verified and emerging zero-energy building projects throughout the United States.[57] For this metric, we considered verified zero energy buildings and, to a lesser degree, emerging zero-energy buildings. We then normalized the total by each state by gross domestic product, so as not to favor large states with greater ability to build ZEBs.

Our scoring results show Vermont to be the highest rated with our metric: With its relatively small economy, it has four verified zero-energy buildings and five emerging ones. By sheer numbers alone, California earns the top spot, with 50 verified ZEBs and 236 in the emerging category. Although having the largest economy of any state counterbalances these high numbers, California still ranked third on our list, showing that it has a disproportionately high number of zero-energy buildings. We awarded 0.5 points to states that achieved a ZEB per GDP ratio of 20 or above, which accounts for roughly a third of the states, as shown in Table 33.

[57] Emerging projects are those that have not yet achieved zero-energy status, or those for which NBI does not have data to verify zero-energy performance (NBI 2020).

Table 33. Zero-energy buildings per GDP

State	Verified ZEBs	Emerging ZEBs	State GDP (trillion dollars)	ZEBs per GDP*	Score (0.5 points)
Vermont	4	6	0.030	232.0	0.5
Oregon	5	26	0.234	77.0	0.5
Hawaii	3	5	0.083	65.9	0.5
California	50	236	2.893	58.1	0.5
District of Columbia		9	0.138	32.6	0.5
Maine	1	2	0.061	32.5	0.5
Massachusetts	7	21	0.547	32.0	0.5
Nevada	2	6	0.156	32.0	0.5
Colorado	2	17	0.365	28.8	0.5
Arizona	1	18	0.350	28.6	0.5
Utah	2	6	0.183	27.3	0.5
Kentucky	3	4	0.194	25.8	0.5
New Hampshire		4	0.079	25.4	0.5
Montana		2	0.048	21.0	0.5
North Dakota		2	0.050	20.0	0.5
Washington	7	9	0.580	19.8	0
Iowa	2	3	0.179	19.5	0
Connecticut	3	4	0.263	19.0	0
Mississippi	1	2	0.106	18.9	0
Arkansas	1	2	0.121	16.6	0
South Carolina		7	0.225	15.6	0
Wyoming		1	0.033	15.0	0
Virginia	4	7	0.520	14.4	0
Delaware	1		0.072	14.0	0
Maryland	2	7	0.399	13.8	0
Minnesota	1	7	0.348	12.9	0
Idaho	1		0.077	12.9	0
Wisconsin	1	6	0.314	12.7	0
Pennsylvania	5	8	0.724	12.4	0
Florida	7	10	1.027	11.7	0
North Carolina	4	4	0.547	11.0	0
Alaska		1	0.046	11.0	0
New Mexico		2	0.093	10.7	0

State	Verified ZEBs	Emerging ZEBs	State GDP (trillion dollars)	ZEBs per GDP*	Score (0.5 points)
Indiana	2	3	0.344	10.2	0
New York	4	24	1.588	10.1	0
Rhode Island		1	0.056	8.9	0
Nebraska		2	0.120	8.4	0
Ohio	3	4	0.626	8.0	0
West Virginia		1	0.068	7.4	0
Missouri	1	2	0.299	6.7	0
Michigan	1	4	0.475	6.3	0
Kansas		2	0.161	6.2	0
Illinois		10	0.807	6.2	0
Tennessee		4	0.333	6.0	0
Texas	3	13	1.628	5.8	0
Georgia		5	0.581	4.3	0
New Jersey	1	2	0.574	3.5	0
Alabama		1	0.210	2.4	0
Louisiana		1	0.224	2.2	0
Oklahoma			0.173	0.0	0
South Dakota			0.051	0.0	0

*Verified zero-energy buildings are given a weight of 1, while emerging zero-energy buildings are given a weight of 0.5.
Sources: NBI 2019; BEA 2020.

Chapter 5. State Government–Led Initiatives

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INTRODUCTION

State legislatures and governors can advance energy efficiency policies and programs that affect the utilities, transportation, and buildings sectors discussed in previous chapters. They can also do more. In this chapter, we focus on energy efficiency initiatives that are designed, funded, and implemented by state entities, including energy offices, economic development agencies, and general services agencies.

We focus on three initiatives commonly undertaken by state governments: financial incentive programs for consumers, businesses, and industry; lead-by-example policies and programs to improve the energy efficiency of public facilities and fleets; and carbon pricing. This year we removed one category, R&D for energy efficiency technologies and practices, since the vast majority of states administer or support some form of R&D program. However, we continue to collect and post this information on ACEEE's State and Local Policy Database.[58] In lieu of scoring R&D, we expanded our scoring metric for carbon pricing policies that help advance investments in efficiency, as discussed further below.

SCORING AND RESULTS

States could earn up to 6 points in this policy area for the following:

- Financial incentives offered by state agencies (2.5 points)
- Lead-by-example policies (2 points)
- Carbon pricing policy (1.5 points)

Table 34 presents the overall results of scoring on state initiatives.

Table 34. Summary of scores for government-led initiatives

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
California	2.5	2	1.5	6
Connecticut	2.5	2	1.5	6
Delaware	2.5	2	1.5	6
Massachusetts	2.5	2	1.5	6
Rhode Island	2.5	2	1.5	6
Vermont	2.5	2	1.5	6
Colorado	2.5	2	1	5.5
Maine	2.5	1.5	1.5	5.5

[58] See database.aceee.org.

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
Maryland	2.5	2	1	5.5
Minnesota	2.5	2	1	5.5
New Hampshire	2.5	2	1	5.5
New York	2.5	1.5	1.5	5.5
Oregon	2.5	2	1	5.5
Pennsylvania	2.5	2	0.5	5
Tennessee	2.5	2	0.5	5
Virginia	2.5	1.5	1	5
Washington	2.5	2	0.5	5
Nevada	2.5	1	1	4.5
District of Columbia	1.5	1.5	1	4
Florida	2.5	1.5	0	4
Illinois	1.5	2	0.5	4
Kentucky	2.5	1.5	0	4
Missouri	2.5	1.5	0	4
New Mexico	1.5	2	0.5	4
North Carolina	1.5	2	0.5	4
South Carolina	2.5	1.5	0	4
Wisconsin	1.5	1.5	1	4
Alaska	2.5	1	0	3.5
Arkansas	2	1.5	0	3.5
Michigan	2.5	1	0	3.5
Ohio	2.5	1	0	3.5
Texas	1.5	2	0	3.5
Utah	1.5	2	0	3.5
Alabama	1.5	1.5	0	3
Montana	1.5	1.5	0	3
New Jersey	0	2	1	3
Hawaii	0.5	1.5	0.5	2.5
Louisiana	1	1.5	0	2.5
Mississippi	1.5	1	0	2.5
Oklahoma	0.5	1.5	0.5	2.5
Wyoming	2	0.5	0	2.5

State	Financial incentives (2.5 pts.)	Lead by example (2 pts.)	Carbon pricing policy (1.5 pts.)	Total score (6 pts.)
Arizona	1	1	0	2
Georgia	0.5	1.5	0	2
Idaho	1.5	0.5	0	2
Nebraska	1.5	0.5	0	2
Indiana	1	0.5	0	1.5
West Virginia	1.5	0	0	1.5
Iowa	0.5	0.5	0	1
Kansas	0	1	0	1
North Dakota	0.5	0	0	0.5
South Dakota	0	0.5	0	0.5

DISCUSSION

Financial Incentives

While utilities offer ratepayer-funded energy efficiency programs, many states also provide financial incentives to spur the adoption of technologies and practices in homes and businesses. These incentives can be administered by various state agencies but are most often coordinated by state energy offices. Incentives can take many forms: rebates, loans, grants, or bonds for energy efficiency improvements; income tax credits and deductions for individuals or businesses; and sales tax exemptions or reductions for eligible products. Financial incentives can lower the up-front cost and shorten the payback period for energy efficiency upgrades, shrinking two barriers for consumers and businesses seeking to make cost-effective efficiency investments. Incentives also raise consumer awareness of eligible products, encouraging manufacturers and retailers to market these products more actively and to continue to innovate. As economies of scale improve, prices of energy-efficient products fall, enabling the products to eventually compete in the marketplace without the incentives.

SCORES FOR FINANCIAL INCENTIVES

Information regarding state incentives for energy efficiency improvements was gathered through our survey of state energy officials and our review of the Database of State Incentives for Renewables and Efficiency (DSIRE 2020).

We did not give points in this category for utilities' customer-funded financial incentive programs, which are covered in Chapter 2. Here we included state appropriations or bonds, oil overcharge revenues, auction proceeds from the RGGI or California's cap-and-trade program, other non-customer sources, and tax incentives. While state and customer funding sometimes overlap—for example, where state incentives are funded through a system benefits charge—we designed this category to capture energy efficiency initiatives not already captured in Chapter 2.

We also recognized growing state efforts to leverage private dollars for energy efficiency programs by awarding points for loans offered by green banks with active energy efficiency programs, and giving credit for PACE financing programs enabled by state legislation. From 2009 to 2019, energy efficiency projects accounted for 49% of commercial PACE funding (PACENation 2020a). State legislatures pass and amend legislation enabling residential or commercial PACE, and localities or private program administrators typically run the programs, depending on the jurisdiction.[59] Sometimes states play a more prominent role in PACE coordination by administering a statewide program or offering guidance to PACE providers (Fazeli 2016). Because programs are usually locally administered, we did not give extra credit for multiple active PACE programs. We indicate in table 35 whether state PACE activity is in the residential or commercial market or both. We discuss other energy efficiency financing efforts in more detail at the end of this chapter.

States earned up to 2.5 points for major financial incentive programs that encourage the purchase of energy-efficient products.[60] We judged these programs on their relative strength, customer reach, and impact. Incentive programs generally received 0.5 points each, but several states have major incentive programs that we deemed worth 1 point each; these include Arizona, Connecticut, Idaho, Nebraska, Nevada, New York, Texas, Washington, and Wisconsin. States that have at least one active PACE program were awarded 0.5 points. Table 35 shows our scoring of state financial incentives.

It should be noted that the number of financial incentive programs a state implements may not fully reflect the robustness of its efforts. Accordingly, this year we attempted to collect additional information from state energy offices regarding state budgets for financial incentives, program participation rates, verified savings from incentives, and leveraging of private capital. These data are presented in Appendix L.

[59] Currently, 37 states plus Washington, DC, authorize PACE (PACENation 2020b). While most states' PACE activity is in the commercial market, residential PACE is currently offered in California, Florida, and Missouri.

[60] Energy-efficient products include any product or process that reduces energy consumption. While renewable energy technologies such as solar hot-water heating may reduce energy consumption, they are often rolled into larger programs that focus on renewable energy rather than energy efficiency. ACEEE would like to credit states for renewable energy technologies that reduce energy consumption, but they are often difficult to distinguish from broader renewable energy incentives that fall outside the scope of the *State Scorecard*. As a result, they are not credited at this time.

Table 35. State scores for major financial incentive programs

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Alaska	Five loan programs; one grant program	2.5
California	California Infrastructure and Economic Development Bank–led bond program for public buildings; three grants; two revolving loans for public buildings; one loan loss reserve for small businesses; one rebate program; one tax incentive for advanced transportation technologies; commercial and residential PACE financing	2.5
Colorado	Loan loss reserve program; school loan program; Residential Energy Upgrade (RENU) Loan program; Agricultural Energy Efficiency Program; statewide commercial PACE financing	2.5
Connecticut	Connecticut Green Bank–led programs including three loans, three financing options for multifamily and low-to-moderate-income residential projects, commercial PACE financing; one loan for multifamily housing properties; two loans for multifamily and low-income residential projects	2.5
Delaware	Three loan programs; three grant programs; two rebate programs	2.5
Florida	Efficiency and Renewable Improvements in Commercial Aquaculture (ERICA); Rural Community Energy Efficiency Grant Program (RCEE); Renewable Energy and Energy-Efficient Technologies (REET) Grant Matching Program; RESTORE Act; commercial and residential PACE financing	2.5
Kentucky	Grants, loans, and bonds for farms, schools, and local governments; Kentucky Green Bank–funded loan for state government; sales tax exemption for energy-efficient products; commercial PACE financing	2.5
Maine	Residential rebate and incentive; consumer products incentive; commercial and industrial incentive; heat pump incentive; weatherization program	2.5
Maryland	Loans and grant programs for agricultural, residential, multifamily, commercial, and industrial sectors; Smart Energy Communities program; loans for state agencies; commercial PACE financing	2.5
Massachusetts	Alternative Energy and Energy Conservation Patent Exemption (personal and corporate); one bond; several grants	2.5
Michigan	Three loans; two rebates; several grants; commercial PACE financing	2.5
Minnesota	Four loans; three revolving loans; one loan loss reserve; commercial PACE financing	2.5
Missouri	One loan program; one loan loss reserve; one revolving loan; one personal tax deduction; commercial and residential PACE financing	2.5
Nevada	Property tax abatement for green buildings; Home Energy Retrofit Opportunities for Seniors (HEROS); loans for state employees; commercial PACE financing	2.5
New Hampshire	Four revolving loan funds; one grant; commercial PACE financing	2.5
New York	Green Jobs–Green NY Program; loan, grant, financing, rebate, and incentive programs; Energy Conservation Improvements Property Tax Exemption; NY Green Bank; commercial PACE financing	2.5

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Ohio	Two loans; one grant program; property tax exemption for energy-efficient projects; commercial PACE financing	2.5
Oregon	Three grant programs; one rebate; commercial PACE financing	2.5
Pennsylvania	Alternative Energy Investment Fund; Sustainable Energy Finance Program; several grant and loan programs; commercial PACE financing	2.5
Rhode Island	Rhode Island Infrastructure Bank–led programs, including one revolving loan program and commercial PACE financing; two grants; two rebates	2.5
South Carolina	Tax credits and sales tax cap for new energy-efficient manufactured homes; two loan programs; mini-grants	2.5
Tennessee	Energy Efficient Schools Initiative (loans and grants); two grant programs; one loan program	2.5
Vermont	Three Sustainable Energy Loan Fund programs; Energy Loan Guarantee Program; Weatherization Trust Fund; Heat Saver Loan	2.5
Virginia	Energy Leasing Program for state-owned facilities; Clean Energy Manufacturing Incentive Grant Program; one loan program; personal tax incentive; financing for innovative energy technologies; commercial PACE financing	2.5
Washington	Major grant program for energy efficiency in public facilities and local communities; several loans and grants	2.5
Arkansas	Three loans; commercial PACE financing	2
Wyoming	Three grant programs; one loan program	2
Alabama	Alabama SAVES revolving loan program; AlabamaWISE Home Energy Program (loans); EE Retrofit program	1.5
District of Columbia	Green Light Grant Program; commercial PACE financing; DC Green Bank	1.5
Idaho	Income tax deduction for energy efficiency improvements; one major low-interest loan program; Government Leading by Example (GLBE) program for public buildings in rural cities and counties	1.5
Illinois	Renewable Energy and Energy Efficiency Project Financing; Green Energy Loan program; commercial PACE financing	1.5
Mississippi	One loan program; one public sector lease program for energy-efficient equipment; one private-sector grant for industrial energy efficiency	1.5
Montana	Energy conservation installation tax credit; tax deduction for energy-conserving investment; Alternative Energy Revolving Loan Program	1.5
Nebraska	Major loan program (Dollar and Energy Saving Loans); commercial PACE financing	1.5
New Mexico	Sustainable Building Tax Credit (corporate and personal); bond program	1.5
North Carolina	One loan program; one cost savings program; PACE financing	1.5
Texas	Major loan program (Texas LoanSTAR); commercial PACE financing	1.5

State	Major state financial incentives for energy efficiency	Score (2.5 pts.)
Utah	Two loan programs for state-owned buildings and schools; commercial PACE financing	1.5
West Virginia	West Virginia Division of Energy and WVU College of Engineering partnership; EE West Virginia; one revolving loan fund	1.5
Wisconsin	Major loan program (Clean Energy Manufacturing Revolving Loan Fund); commercial PACE financing	1.5
Arizona	Property tax exemption for energy-efficient building components and CHP	1
Indiana	Tax credit for purchase and installation of residential insulation; Green Project Reserve revolving loan fund	1
Louisiana	Home Energy Loan Program (HELP); Energy Fund Loan Program	1
Georgia	One grant program	0.5
Hawaii	Green Energy Market Securitization (GEMS) financing program	0.5
Iowa	Energy Bank Revolving Loan Program	0.5
North Dakota	Energy Conservation Grant	0.5
Oklahoma	Commercial PACE financing	0.5
Kansas	None	0
New Jersey	None	0
South Dakota	None	0

GREEN BANKS

States are increasingly leveraging private capital alongside public dollars to incentivize energy efficiency. One way of doing this is through green banks, which can overcome barriers faced by consumers and lenders in financing energy efficiency and renewable energy projects. While we do not currently give credit solely for the establishment of a green bank, we recognize the important contribution they make to incentivizing energy efficiency.[61] These financing institutions offer public dollars and leverage private funds to unleash new investment, reduce costs, and increase consumer demand in the clean energy sector. In addition, green banks often provide technical assistance to clean energy projects across sectors to help consumers understand available funding streams and to simplify the process of purchasing efficiency technologies (CGC 2015).

Because most state green banks are in the early planning stages and have yet to reach full scale, there is a lack of data on their performance (Gilleo, Stickles, and Kramer 2016). To more accurately assess the impacts of financing programs offered by green banks, policymakers and program administrators should collect data—and standardize data collection efforts—on the following metrics:

[61] While we credit evaluated savings from financing programs (including on-bill financing programs) in the utilities chapter, in this chapter we recognize financing programs like green banks that leverage additional, non-ratepayer state resources.

- *Energy savings.* Independently evaluated energy savings achieved as a result of green bank investments
- *Leverage.* The ratio of private loan capital deployed and public or ratepayer funds used
- *Market penetration.* In particular, whether financing is available to low-income, multifamily, and other underserved markets
- *Coordination with utility programs.* The extent to which green banks and utilities coordinate program offerings

Leading and Trending States: Financial Incentives

Maine. Deployed statewide in October 2019 through Maine's Community Action Agency (CAA) network, MaineHousing's Heat Pump Program pays for the cost and installation of a heat pump for eligible Maine homeowners. As of the end of May 2020, the state's CAAs reported that 1,098 households had expressed an interest in or were on wait lists for heat pumps. So far, CAAs have managed the installation of 175 heat pumps at a cost of $563,321.

Hawaii. On April 8, 2019, Hawaii Governor David Ige formally announced the Green Energy Money $aver (GEM$) on-bill financing program, a statewide initiative to make clean energy more affordable for homes and small businesses. The culmination of more than seven years of work by Hawaiian authorities, the program provides easy-access financing for cost-effective rooftop solar panels and other renewable distributed energy systems, as well as energy efficiency upgrades. The GEM$ On-Bill Program is available to about 95% of Hawaii's population. In addition to rooftop solar, eligible projects include solar hot-water heaters, heat pump water heaters, and energy efficiency measures. Projects must be designed to reduce energy bills by at least 10% after accounting for repayment of the clean energy investment.

New Hampshire. The Clean Energy Fund invests in energy efficiency and renewable energy projects that reduce costs for New Hampshire businesses, nonprofits, and municipalities; help address New Hampshire's energy challenges in a fiscally and environmentally responsible manner; lower the state's contribution to global climate impacts; and reduce barriers for equitable access to clean energy benefits. Capitalized at more than $10 million, the fund merges four individual revolving loan funds dedicated to financing energy efficiency improvements and clean/renewable energy initiatives into a single program and application process, providing low-interest loans along with energy technical assistance and project funding guidance. Funding for the program comes from a combination of federal and state sources as well as the Community Development Finance Authority's own funds.

New York. The NY Green Bank (NYGB) was established in 2013 as a state-sponsored specialty financing entity housed within the New York State Energy and Development Authority (NYSERDA). NYGB combines funds from ratepayers and RGGI to leverage private clean energy capital. In 2020 NYGB reported that $117.5 million of capital had been committed in the fourth quarter of 2019, making 2019 its best-performing year to date with $276.1 million allocated. The total NYGB portfolio stands at more than $909 million, encouraging up to $2.4 billion in clean energy investments. NYGB's recent energy efficiency projects include financing the new construction of Saranac Waterfront Lodge, the first LEED-certified hotel in Adirondack Park, and providing a term loan to Ecosave, an energy services company, to support at least five energy efficiency or distributed generation projects. NYGB's investments have driven between 10 million and 18 million metric tons of gross lifetime GHG reductions, equivalent to removing up to 183,599 cars from the road for the next 23 years. These efforts support the state's goal of reducing GHGs 85% by 2050 (NYSERDA 2020).

Lead by Example

State governments can advance energy-efficient technologies and practices in the marketplace by adopting policies and programs to save energy in public sector buildings and fleets, a practice commonly referred to as *lead by example*. In the current environment of fiscal austerity, lead-by-example policies and programs are a proven strategy for improving the operational efficiency and economic performance of states' assets. Lead-by-example initiatives also reduce the negative environmental and health impacts of high energy use and promote energy efficiency to the broader public.[62]

States can show leadership in energy efficiency policy through the development of state energy plans, and in fact most states have them.[63] Governors can issue executive orders or form planning committees to evaluate state energy needs, goals, and opportunities.[64] Sometimes legislatures initiate the process. These actions help establish a statewide vision for energy use. We do not award points solely for the existence of a state energy plan, but we do consider the formal executive orders and policies that execute energy efficiency initiatives included in such plans.

SCORES FOR LEAD BY EXAMPLE

States could earn up to 2 points in this category: 0.5 points each for energy savings targets in new and existing state buildings, benchmarking requirements for public facilities, energy savings performance contract (ESPC) activities, and fleet fuel efficiency mandates. We based our review of states' lead-by-example initiatives on our survey of state energy officials as well as independent research.

State building requirements. Many states have adopted policies and comprehensive programs to reduce energy use in state buildings. State governments operate numerous facilities, including office buildings, public schools, colleges, and universities, the energy costs of which can account for as much as 10% of a typical government's annual operating budget. In addition, the energy consumed by a state's facilities can account for as much as 90% of its GHG emissions (DOE 2008). Only a handful of states have not yet implemented an energy efficiency policy for public facilities. Mandatory energy savings targets for new and existing state government facilities are the most widely adopted state measures. These requirements encourage states to invest in the construction of new, efficient buildings and retrofit projects, lowering energy bills and promoting economic development in the energy services and construction sectors.

To earn credit, energy savings targets must commit state government facilities to a specific energy reduction goal over a distinct time period. We also gave 0.5 points to states that

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[62] Energy efficiency limits harmful pollutants by reducing the need to burn fossil fuels to generate electricity. ACEEE and Physicians for Social Responsibility explore this connection in a joint fact sheet at aceee.org/fact-sheet/ee-and-health.

[63] See naseo.org/stateenergyplans.

[64] See ACEEE's *Energy Efficiency Toolkit for Governors* (2019) for more information: aceee.org/topic-brief/governors-ee-toolkit.

require state buildings to exceed the statewide energy code or meet a green building criterion like Leadership in Energy and Environmental Design (LEED) certification.

Benchmarking requirements for public buildings. Proper building energy management is a critical element of successful energy efficiency initiatives in the public sector. Benchmarking energy use in public sector buildings through tailored tools or widely available tools such as ENERGY STAR Portfolio Manager ensures a comprehensive set of energy consumption data that can be used to drive cost-effective energy efficiency investments.[65] Comparing building energy performance across agencies can also help prioritize energy efficiency projects.

Through benchmarking policies, states and cities require all buildings of a certain size or type to undergo a regular energy audit or have their energy performance tracked. We awarded 0.5 points for energy benchmarking policies and large-scale benchmarking programs for public sector facilities.

Efficient fleets. In addition to lead-by-example initiatives in state government buildings, many states enact policies encouraging or requiring efficient vehicle fleets to reduce fuel costs and hedge against rising fuel prices. Collectively, state governments own approximately 500,000 vehicles, with a median fleet size of about 3,500. Operation and maintenance costs for these fleets every year exceed $2.5 billion nationwide, ranging from $7 million to $250 million per state (NCFSA 2007). In response to these costs, states may adopt an efficiency standard specifically for state vehicle fleets that reduces fuel consumption and GHG emissions.

For this category, states received credit only if the plan or policy for increasing the efficiency of its fleet contains a specific, mandatory requirement. For example, states could qualify for 0.5 points if fleet policies specify fuel economy improvements that exceed existing CAFE standards. Other policies that earned 0.5 points include binding goals to reduce petroleum use by a certain amount over a given time frame, meaningful GHG reduction targets for fleets, and procurement requirements for hybrid-electric or all-electric vehicles. However, state adoption of such targets does not guarantee they will be achieved; we will continue to seek data on state progress toward meeting these goals and may revisit this metric in the future with an eye toward measured achievement of targets. We did not credit requirements for procuring alternative-fuel vehicles because such vehicles may not result in improved fuel economy.

Energy savings performance contracting policies and programs. If state governments have the necessary support, leadership, and tools in place, they can help projects overcome information and cost barriers by financing energy improvements through ESPCs. The state may enter into an ESPC with an energy services company (ESCO), paying for these services

[65] Some states have their own databases of public building energy use that integrate with the ENERGY STAR Portfolio Manager. For example, Maryland's EnergyCAP database compiles the energy use (based on utility bills) of all public buildings in the state and enables comparison of buildings occupied by various state agencies.

with money saved on lower energy bills from energy conservation measures. A designated state agency may serve as the lead contact for implementing the contract.[66]

We based scores for ESPC activities on support, leadership, and tools. To promote performance contracting, states must provide an enabling framework (support) and guidance and resources (leadership and tools) to get projects underway. We awarded a state 0.5 points if it satisfied at least two of the three criteria. Table 36 describes qualifying actions.

Table 36. Scoring of ESPC policies and programs

Criterion	Qualifying action
Support	The state explicitly promotes the use of ESPCs to improve the energy efficiency of public buildings through statutory requirements, recommendations, or explicit preferences for ESPC use; executive orders that promote or require ESPCs; and/or financial incentives for agencies seeking to use ESPCs.
Leadership	A state program directly coordinates ESPCs, or a specific state agency serves as lead contact for implementing ESPCs.
Tools	The state offers documents that streamline and standardize the ESPC process, including a list of prequalified service companies, model contracts, and/or a manual that lays out the procedures required for state agencies to utilize ESPCs.

States must satisfy at least two of the three criteria above to receive credit.

Table 37 presents states' overall scores for lead-by-example efforts.

Table 37. State scores for lead-by-example initiatives

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
California	•	•	•	•	2
Colorado	•	•	•	•	2
Connecticut	•	•	•	•	2
Delaware	•	•	•	•	2
Illinois	•	•	•	•	2
Maryland	•	•	•	•	2
Massachusetts	•	•	•	•	2
Minnesota	•	•	•	•	2
New Hampshire	•	•	•	•	2

[66] For a full discussion of ESPCs, the ESCO market, and actual implementation trends, see Stuart et al. (2016). For additional best practices in state and local establishment and implementation of ESPC programs, see DOE's ESPC Toolkit (betterbuildingssolutioncenter.energy.gov/energy-savings-performance-contracting-espc-toolkit) and its guidelines for state ESPC program development (betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/ESPC-Program_Guidelines_Final.pdf).

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
New Jersey	•	•	•	•	2
New Mexico	•	•	•	•	2
North Carolina	•	•	•	•	2
Oregon	•	•	•	•	2
Pennsylvania	•	•	•	•	2
Rhode Island	•	•	•	•	2
Tennessee	•	•	•	•	2
Texas	•	•	•	•	2
Utah	•	•	•	•	2
Vermont	•	•	•	•	2
Washington	•	•	•	•	2
Alabama		•	•	•	1.5
Arkansas	•	•		•	1.5
District of Columbia	•	•	•		1.5
Florida		•	•	•	1.5
Georgia	•	•		•	1.5
Hawaii		•	•	•	1.5
Kentucky	•	•		•	1.5
Louisiana	•		•	•	1.5
Maine	•		•	•	1.5
Missouri	•		•	•	1.5
Montana	•	•		•	1.5
New York	•	•		•	1.5
Oklahoma	•	•		•	1.5
South Carolina	•	•		•	1.5
Virginia	•	•		•	1.5
Wisconsin	•		•	•	1.5
Alaska	•	•			1
Arizona	•			•	1
Kansas	•			•	1
Michigan		•		•	1
Mississippi		•	•		1
Nevada		•		•	1

State	New and existing state building requirements	Benchmarking requirements for public buildings	Efficient fleets	ESPC policy and programs	Score (2 pts.)
Ohio		•		•	1
Idaho				•	0.5
Indiana	•				0.5
Iowa		•			0.5
Nebraska		•			0.5
South Dakota		•			0.5
Wyoming				•	0.5
North Dakota					0
West Virginia					0

Leading and Trending States: Lead-by-Example Initiatives

New Mexico. In 2019, Governor Michelle Lujan Grisham signed Executive Order 2019-003, which commits the state to the 2015 Paris Agreement goals and to the U.S. Climate Alliance. The order also creates a New Mexico Climate Change Task Force that will work toward a statewide climate strategy. In particular, the task force will aim to reduce light-duty vehicle emissions, set emissions limits through a market-based program, adopt new building codes, identify transmission corridors to transport renewable energy, and strengthen the state's renewable portfolio and energy efficiency standards. Further, state agencies are now required to incorporate climate mitigation and adaptation strategies into their programs and implement policies to further reduce GHGs.

Connecticut. Signed by Governor Ned Lamont in 2019, Executive Order No. 1 calls for reducing energy consumption and GHG emissions from state government operations. Focusing on state buildings, a steering committee will work on onsite heating and cooling, electricity, clean energy, vehicles, waste management, water use, and product procurement to help the state achieve its GHG emissions, waste disposal, and water consumption goals. The committee will also consider how to meet a net-zero emissions target for 2050.

Oregon. Executive Order 20-04, signed by Governor Kate Brown in 2020, establishes a plan for meeting the state's climate goals by directing state agencies to put new measures into effect to lower the state's greenhouse gas emissions. The order directs the Environmental Quality Commission and Department of Environmental Quality to amend Oregon's Clean Fuel Standards to meet GHG emissions reduction goals per unit of fuel energy. Additionally, the order requires the Department of Consumer and Business Services Building Codes Division to establish energy efficiency goals for new residential and commercial construction. The Department of Administrative Services is also directed to develop a statewide electric vehicle procurement policy for state agencies. Altogether, the order aims for the state of Oregon to reduce GHG emissions by at least 45% below 1990 levels by 2035 and at least 80% below 1990 levels by 2050 (Oregon Office of the Governor 2020).

Nevada. In 2019, Governor Steve Sisolak signed Executive Order 2019-22, which directs the administration to collaborate with public, private, and tribal partners to accelerate the state's action on meeting its bold climate goals. The order directs state agencies to assess viable

policies and regulatory strategies to meet greenhouse gas reduction requirements. Moreover, the order prioritizes building energy codes to increase residential and commercial energy efficiency to achieve emissions reductions. The bill also mandates each state agency to develop priority lists for building energy efficiency projects to be shared with the administration. The administration will investigate financing opportunities for these projects, as indicated by the order (Nevada Office of the Governor 2019).

Carbon Pricing

Recent years have seen a surge in actions to strengthen GHG and renewable generation goals, including the 2019 enactment of 100% clean energy targets in five states (Nevada, New Mexico, Washington, New York, and Maine). Accordingly, last year we introduced a new metric on state carbon pricing policies that have helped support and advance efficiency programs. These policies aim to put a price on carbon, the idea being that if emitting GHGs increases costs, then the market will find a way to reduce emissions at the lowest possible expense (Nadel and Kubes 2019). Two main types of pricing are generally used: a carbon tax and a cap-and-trade system. A carbon tax is a fee charged for each unit of CO_2 (typically a tonne) that is emitted. A cap-and-trade system sets a limit on the total amount of CO_2 that can be emitted and divides this total into emissions allowances. It then distributes these allowances among GHG-emitting companies, creating a market in which the certificates can be bought and sold.

Energy efficiency plays an important role in the successful implementation of carbon pricing policies. When the funds collected from these policies are invested in efficiency, they reduce energy use, energy bills, and energy-related emissions. That can help achieve net economic benefits and cushion the effect of a carbon pricing program on energy costs (Nadel and Kubes 2019). For example, RGGI has dedicated to energy efficiency about 58% of the funds it has raised from cap-and-trade activity (RGGI 2018). That has resulted in decreased emissions, lower customer bills, lower wholesale power prices, new jobs, and a strengthened local economy (Hibbard et al. 2018).

This year we added two new sub-metrics. The first scores whether states or utilities track avoided greenhouse gas emissions achieved through energy efficiency programs, and the second scores whether utilities include avoided costs from emissions reductions in their cost-effectiveness screening. Both of these metrics are important in calculating impacts of efficiency programs and determining ways to increase their success.

SCORES FOR CARBON PRICING

States could earn up to 1.5 points in this category: 0.5 points for having either a carbon tax or a cap-and-trade policy in place; 0.5 points for tracking avoided greenhouse gas emissions achieved through energy efficiency programs; and 0.5 points for including avoided greenhouse gas emissions within benefit–cost testing calculations. Table 38 highlights the total scores for these metrics.

Table 38. State scores for carbon pricing metrics

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
California	•	•	•	1.5
Connecticut	•	•	•	1.5
Delaware	•	•	•	1.5
Maine	•	•	•	1.5
Massachusetts	•	•	•	1.5
New York	•	•	•	1.5

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
Rhode Island	•	•	•	1.5
Vermont	•	•	•	1.5
Colorado		•	•	1
District of Columbia		•	•	1
Maryland	•	•		1
Minnesota		•	•	1
Nevada		•	•	1
New Hampshire	•	•		1
New Jersey	•	•		1
Oregon		•	•	1
Virginia	•	•		1
Wisconsin		•	•	1
Hawaii		•		0.5
Illinois			•	0.5
New Mexico		•		0.5
North Carolina		•		0.5
Oklahoma		•		0.5
Pennsylvania		•		0.5
Tennessee		•		0.5
Washington			•	0.5
Alabama				0
Alaska				0
Arizona				0
Arkansas				0
Florida				0
Georgia				0
Idaho				0
Indiana				0
Iowa				0
Kansas				0
Kentucky				0
Louisiana				0
Michigan				0
Mississippi				0

State	Carbon pricing policy	GHG emissions tracking	Cost-effectiveness test inclusion	Score (1.5 pts.)
Missouri				0
Montana				0
Nebraska				0
North Dakota				0
Ohio				0
South Carolina				0
South Dakota				0
Texas				0
Utah				0
West Virginia				0
Wyoming				0

Table 39 lists state and utility efforts to track avoided emissions resulting from efficiency programs as described in responses to the *2020 State Scorecard* data request to state energy officials and utility regulators.

Table 39. State and utility responses on avoided emissions tracking

State	Response on GHG tracking
California	The California Air Resources Board, California Public Utilities Commission, and California Energy Commission all track avoided GHG emissions achieved through energy efficiency programs.
Colorado	Colorado reports GHG emissions reductions as a result of energy efficiency programs in its DSM annual report.
Delaware	Avoided GHG emissions are reported to RGGI for all programs funded by RGGI proceeds. In keeping with the state's EM&V regulations, program administrators file reports with the Energy Efficiency Advisory Council on energy impact information for each program; these data are used to calculate avoided greenhouse gas emissions achieved through the programs.
District of Columbia	The DC Sustainable Energy Utility tracks avoided GHG emissions associated with electric and natural gas efficiency programs, assigning a general CO_2 amount associated with each kWh and MMBtu avoided.
Hawaii	Hawaii Energy tracks GHG emissions (pre-PY19) and set targets for PY19-PY21.
Maine	The Efficiency Maine Trust reports on GHG emissions achieved through RGGI-funded energy efficiency programs through the annual "Investment of RGGI Proceeds" report to RGGI, Inc. and the RGGI Annual Report to the Maine State Legislature.

State	Response on GHG tracking
Maryland	Maryland's Greenhouse Gas Reduction Act requires the development of a GHG reduction plan and established a Maryland Climate Change Commission to help with the development of the plan. For this effort, GHG reductions are tracked economy wide, thus reflecting the results of energy efficiency and renewable energy efforts, as well as nonenergy benefits. Some reports by the EmPOWER utilities include information about GHG reductions resulting from energy efficiency programs, but reporting is not required.
Massachusetts	Most of the state's efficiency programs track avoided emissions. Some state programs (e.g., grants for training and market development) do not track avoided emissions because they address overcoming market barriers at various stages of the energy efficiency life-cycle rather than achieving direct savings.
Minnesota	The Department of Commerce publishes an annual report on the energy savings and estimated carbon dioxide reductions achieved by energy conservation improvement programs for the two most recent years for which data are available.
Nevada	Nevada reports GHG emissions reductions as a result of energy efficiency programs in its DSM annual report.
New Hampshire	The utilities typically quantify the amount of GHG reductions in their plans and quarterly updates.
New Jersey	The state requires that utilities filing energy efficiency and peak demand programs for the next generation of energy efficiency programming in New Jersey include emissions savings as a part of the minimum filing requirements. Emissions savings must be tracked and reported and will be evaluated through the evaluation, measurement, and verification process. The state will also track and report GHG emissions, among other metrics.
New Mexico	The state tracks emissions reductions for all of its programs and reports them as part of the ACEEE data request.
New York	NYSERDA and the utilities track and report avoided GHG emissions through energy efficiency programs, and results are publicly available through the Clean Energy Dashboard.
North Carolina	The NC Division of Air Quality produces an annual report that quantifies reductions in GHG from avoided generation due to energy efficiency and other non-emitting power sources that receive credits under the NC Renewable Energy and Energy Efficiency Portfolio Standard.
Oklahoma	Both Public Service Company of Oklahoma and Oklahoma Gas and Electric track avoided greenhouse gas emissions, specifically tons of CO_2e emissions savings.
Oregon	The state tracks avoided GHGs from many energy efficiency programs but does not publish the information. The state tracks and publishes GHG data of electric utilities to assist customers in understanding the impact of their electricity use. Energy Trust tracks avoided carbon emissions within its service territory.
Pennsylvania	A centralized greenhouse gas emissions tracking system does not exist for all the programs with state funding since some of the programs are housed in other agencies. However, the Pennsylvania Energy Programs Office does track emissions through its various programs. The state's Climate Action Plan and Greenhouse Gas Inventory, as required by PA Act 70 of 2008, tracks statewide emissions trends.

State	Response on GHG tracking
Rhode Island	The utility tracks avoided greenhouse gas emissions and reports that as part of its annual energy efficiency programs. Specifically, the utility projects values in its annual planning process and reports on the actuals in its year-end reports. In addition, GHG reductions from the state's EE programs are included in the statewide GHG inventories.
Tennessee	The state's Office of Energy Programs estimates CO_2 emissions avoided by state-led energy efficiency programs, including EmPower Tennessee, Energy Efficient Schools Initiative, and Pathway Energy Efficiency and Renewable Energy Loan Program.
Vermont	The state tracks avoided emissions for its energy efficiency programs as well as for Renewable Energy Standard Tier 3 programs. The information is included in the energy efficiency utility and distribution utility Tier 3 annual reports.
Virginia	The Department of Mines, Minerals, and Energy provides data on energy efficiency program savings to the Department of Environmental Quality, which tracks total GHG emissions and emissions reduction initiatives through CDP (formerly Carbon Disclosure Project).
Wisconsin	Focus on Energy tracks carbon dioxide reductions achieved through energy efficiency programs.

Leading and Trending States: Carbon Pricing Policies

Virginia. In early March 2020, a bill called the Virginia Clean Economy Act was signed by Governor Ralph Northam. The legislation encourages the state to implement a carbon dioxide cap-and-trade program that applies to electric generation facilities and complies with the Regional Greenhouse Gas Initiative (RGGI). The act also requires the Virginia Corporation Commission to receive a report from the Air Pollution Control Board before approval of "any investor-owned utility to own, operate, or construct any electric generating unit that emits carbon as a by-product of combusting fuel to generate electricity." It also mandates the commission and utilities to account for the social cost of carbon when assessing the need for new electric generating facilities (Virginia General Assembly 2020).

New Jersey. In June 2019 the New Jersey Department of Environmental Protection approved two rules that authorized the state to rejoin the Regional Greenhouse Gas Initiative. One of them, the Carbon Dioxide Trading rule, established a carbon dioxide cap for the state's electricity generation sector at 18 million tons in 2020. New Jersey's carbon dioxide budget will decrease 30% by 2030. The state rejoined RGGI after being withdrawn by former governor Chris Christie in 2012. New Jersey's move to rejoin RGGI is an important step for the state to meet its goal of 100% clean energy by 2050 (New Jersey Office of the Governor 2019).

Pennsylvania. In November 2019 Governor Tom Wolf signed Executive Order 2019-07, which directed the Pennsylvania Department of Environmental Protection (DEP) to enter the Regional Greenhouse Gas Initiative. The order requires the DEP to develop a proposed rulemaking package to mitigate carbon dioxide emissions from electric power generators and to present the package to the Pennsylvania Environmental Quality Board. The proposed rulemaking must incorporate thorough public outreach to ensure the program results in decreased GHG emissions, increased economic productivity, and reduced costs for the consumer. The DEP is also directed to work with PJM, the regional transmission organization, to ensure the

integration of this program results in competitive economic dispatch and reduced emissions discharge (Pennsylvania Office of the Governor 2019).

Energy Efficiency Programs for Low-Income Households

As discussed in Chapter 2, low-income households often face a disproportionate energy burden that can be alleviated by energy efficiency (Drehobl and Ross 2016). Reducing energy burdens for low-income households not only keeps money in these families' pockets but also improves their quality of life by creating healthier homes and neighborhoods. These efforts can help states address other priorities such as reduced emissions, economic development, and improved public health.

Energy efficiency programs for low-income households are often supported by a diverse array of funding streams that may include federal, state, or ratepayer dollars. They can be administered by utilities, state government, community action agencies, or other organizations. In Chapter 2 we specifically highlighted utility- and ratepayer-funded income-qualified programs, although in practice these often use other resources as well, since nonutility weatherization funding can be used to leverage ratepayer funds, and vice versa.

State energy offices, state housing agencies, and partner agencies have many options for investing in energy efficiency in under-resourced communities. These options include:

- Designing energy efficiency programs or incentives specifically for low-income households and investing state resources alongside federal and ratepayer dollars;
- Leveraging existing Weatherization Assistance Program delivery channels to expand energy efficiency offerings to program participants;
- Providing technical assistance and financial resources to public housing authorities as they work with ESCOs to improve their properties;
- Encouraging agencies and organizations allocating federal grants to income-qualified recipients, such as the Low-Income Housing Tax Credit, to prioritize energy efficiency in their allocation process.

States can also address low-income equity and workforce development needs through state energy plans and electrification strategies. As states move toward policies and programs to meet more ambitious GHG reduction targets by switching end uses to electricity, there is also an interest in making sure these fuel-switching efforts are in fact beneficial—i.e., that they save customers money and reduce environmental impacts. It is also important that electrification strategies be inclusive of low-income households, which may face unique barriers such as high up-front costs or lack of access to new electric technologies and appliances. Meanwhile, equitable workforce development extends benefits from these programs to underserved community members while achieving a strong, capable workforce that can impact the scale and quality of implementation (Shoemaker and Ribeiro 2018). Opportunities include:

- **Offering enhanced fuel-switching incentives for low-income customers.** The Colorado WAP is running a pilot program to install air source heat pumps, which will support building electrification for homeowners, both now through direct install and in the future once its impacts are better understood. In Maine, low-income customers qualify for a higher heat pump rebate under the Affordable Heat Initiative than the standard Home Energy Savings Program rebate (Efficiency Maine Trust 2020).
- **Developing equity-related metrics and reporting frameworks.** The Oregon PUC applies annual "diversity, equity, and inclusion" performance metrics to Energy Trust, including items such as "Complete 1,000 projects with trade allies that are minority-owned businesses" and "Implement a rural-focused workshop." These metrics are revisited every year.
- **Establishing stakeholder processes to better understand low-income sector needs.** Iowa's Energy Workforce Consortium brings industry experts, state agencies, and community colleges together to discuss and collaborate on the changing workforce and the needs of the energy industry.
- **Working with state and local colleges to provide training and technical resources, incentives for LMI communities and displaced workers, and incentives for using certain labor standards.** New Mexico's 2019 Energy Transition Act creates three new funds to provide transition assistance to tribal communities, displaced workers, and communities affected by coal plant closures. The state of Washington's Clean Energy Transformation Act includes incentives for workforce development in the form of a tax credit for using certain labor standards.

Through ongoing research and outreach, ACEEE is working to help states and utilities identify the challenges and opportunities in delivering energy efficiency to the low-income market. For more information and examples of supportive policies, please visit ACEEE's State and Local Policy Database.[67]

[67] See database.aceee.org/state/equity-workforce.

Chapter 6. Appliance and Equipment Efficiency Standards

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INTRODUCTION

The year 2020 looked to be a very promising one for state appliance standards until the COVID-19 pandemic forced many state legislatures to adjourn or to operate on a limited basis. Though some legislatures reconvened, most restricted their work to COVID- or budget-related bills, leaving other legislation to die. Nonetheless, there were successes during the past 12 months. New York Governor Andrew Cuomo signed an appliance standards bill in December 2019, the California Energy Commission adopted several new standards, and Oregon Governor Kate Brown signed an executive order directing the state's Department of Energy to establish standards for 10 products by September 1, 2020. Of the 10 states that filed appliance standards bills, those in Massachusetts, New Jersey, and the District of Columbia are still under consideration.

State-level actions on appliance standards have taken on added urgency in recent years, given federal efforts to chip away at the national appliance standards program. Beyond missing legal deadlines for the review of 28 product standards, the current federal leadership has also rolled back light bulb standards that would have saved billions of dollars for consumers and businesses and finalized changes to the federal program to make it harder to update any existing standards. Amid these reversals, as well as ongoing systemic threats to the economy posed by climate change and COVID-19, state-level policies like appliance standards are critical to reduce energy use, save consumers money, and cut climate-changing emissions.

The power of appliance standards is in the numbers. Every day we use appliances, equipment, and lighting in our homes, offices, and public buildings. Even when the energy consumption of a particular device seems small, the extra energy consumed by less-efficient products collectively adds up to a substantial amount. However, persistent market barriers inhibit sales of more efficient models to consumers. Appliance efficiency standards overcome these barriers by initiating change at the manufacturer level, requiring appliance makers to meet minimum efficiency criteria for all products and thereby removing the most inefficient products from the market.

States have historically led the way in establishing standards for appliances and other equipment. In 1976 California became the first state to introduce appliance standards. Many others, including New York and Massachusetts, soon followed. Congress established the first national standards—based on standards previously adopted by California and several other states—in 1987 when it passed the National Appliance Energy Conservation Act. Congress enacted additional national standards in 1988, 1992, 2005, and 2007, generally basing them on existing state standards. The federal laws have typically set initial standards for specific products and required DOE to periodically review and, if warranted, strengthen them. More than 60 products are now subject to national efficiency standards. Most directly relate to energy use, although several address water efficiency.

Existing national standards saved the average U.S. household about $500 a year on utility bills in 2015, or about 16% of average annual utility bill spending. Businesses saved a total of $23 billion in utility bills that year, or about 8% of total business spending on electricity and

natural gas. Total household and business utility bill savings reached $80 billion in 2015. Annual savings will increase to nearly $150 billion by 2030 as new national standards kick in and the effects of existing ones grow (deLaski and Mauer 2017).

Federal preemption generally prevents states from setting their own standards for federally regulated products. States that wish to implement their own standards after federal preemption generally must apply for a waiver; however, states remain free to set standards for any products that are not subject to national standards. State standards can generate significant energy and water savings and set precedents for adopting new national standards.

States have responded to the federal government's inaction and its efforts to weaken the national standards program. In 2020 lawmakers in 10 states (Arizona, Connecticut, Hawaii, Illinois, Maine, Massachusetts, Oregon, Pennsylvania, Rhode Island, and Vermont) and the District of Columbia pursued standards based on recommendations from the ASAP and ACEEE report *States Go First* (Mauer, deLaski, and DiMascio 2017) and its 2020 update.[68] The efficiency levels for products in the state legislation are based on California standards and ENERGY STAR and WaterSense specifications. Some states added legislative provisions to protect against the rollback of light bulb and other federal standards, and others added language to adopt standards for non-preempted bulbs.

During the period covered by this year's *Scorecard*, New York adopted standards for faucets, showerheads, toilets, urinals, and drinking fountains. The California Energy Commission (CEC) adopted new standards for replacement pool pump motors and spray sprinkler bodies and broadened the scope of general-service lamp standards. Oregon completed a rulemaking on August 28, 2020, establishing new efficiency standards for nine products and updating standards for two others. The standards require legislative approval before they go into effect.

In addition to the above, since 2017, four states (Colorado, Hawaii, Vermont, and Washington) have adopted appliance standards packages varying from 5 products in Hawaii to 18 products in Vermont. The products include computers and monitors, faucets, showerheads, commercial dishwashers, and portable air conditioners. Washington also adopted a design standard for electric storage water heaters that would enable utility programs to manage water heating loads.

States also adopted provisions to protect against the rollback of federal appliance standards (Colorado, Hawaii, Vermont, and Washington) and federal light bulb standards (Colorado, Nevada, Vermont, and Washington). Finally, Hawaii, Nevada, New York, and Washington adopted standards for water-saving products such as faucets, showerheads, toilets, and urinals, joining a handful of drought-prone states (California, Colorado, Georgia, and Texas) that have done so over the past decade. The faucet and showerhead standards will also save energy by reducing hot-water consumption.

[68] The report recommends a package of standards that states can adopt and analyzes potential energy, water, and utility bill savings and emissions reductions.

SCORING AND RESULTS

States could earn up to 2.5 points for savings from state-specific appliance standards that are not currently preempted by federal standards; they could earn another 0.5 points for adopting existing federal standards.[69] This scoring system credits states for adopting new standards that substitute for or expand on existing federal standards.

We credited standards only if the compliance date (not the adoption date) for at least one state with an equivalent standard was within the past five calendar years or is slated for the future. This acknowledges the important role early adopters play in paving the way for other states. For example, California adopted efficiency standards for faucets in 2015, followed by Vermont in 2018 and Colorado, Hawaii, New York, and Washington in 2019 (with compliance required in 2020 and 2021). California and the above states will continue to get credit for faucet standards until at least 2026 (five years after the last compliance date)—or even longer should additional states adopt the faucet standards. Televisions dropped off the list this year since the last compliance date was six years ago, in 2014.

We calculated scores for the adoption of state standards on the basis of cumulative per capita savings (measured in million Btus) through 2035. We used a floating start date that aligns with each state's product compliance date. For example, standards for commercial dishwashers took effect in Vermont in 2020. Our savings analysis for that product in Vermont covers the period from 2020 to 2035. Colorado and Washington adopted standards for commercial dishwashers that will take effect in 2021, and so for those states the analysis period begins in 2021.

Our savings estimates were based on the approach used by ASAP and ACEEE in previous analyses of savings from appliance standards (Mauer, deLaski, and DiMascio 2017). We used estimates of annual shipments, per-unit energy savings, and average product lifetimes based on the best available data. To estimate state-by-state shipments, we allocated national shipments to individual states on the basis of population. We also accounted for the portion of sales that had already met the standard level at the time the first state standard was established for a given product.

We normalized the savings estimates using the population of each state in order to rank states according to per-capita energy savings. We scored in 0.5-point increments up to a maximum of 2.5 points.

Table 40 shows the scoring breakdown for state standards.

[69] In 2018 and 2019, states could earn 0.5 points for adopting either federal appliance standards or federal light bulbs standards in case federal standards were rolled back. However, in 2019 the Trump administration did roll back and narrow the scope of the light bulb standards. Therefore, in 2020, instead of awarding a flat 0.5 points for adopting non-preempted light bulb standards, we estimated the savings from the standards.

Table 40. Scoring of savings from state appliance standards

Energy savings through 2035 (MMBtus/capita)	Score
35 or more	2.5
25–34.99	2
15–24.99	1.5
5–14.99	1
0.1–4.99	0.5
No energy savings	0

Other consideration	Score
Adoption of existing federal standards	+0.5

Table 41 shows the scoring results, with points allocated for the adoption of both state-specific and federal standards.

Table 41. Scoring for appliance efficiency standards

State	Energy savings from state standards through 2035 (MMBtus/capita)	Year most recent state standards were adopted	Score for adoption of state standards	Score for adoption of federal standards	Total score (3 pts.)
California	41.3	2020	2.5	0.5	3.0
Colorado	19.3	2019	1.5	0.5	2.0
Washington	19.3	2019	1.5	0.5	2.0
Vermont	17.6	2019	1.5	0.5	2.0
Hawaii	14.0	2019	1	0.5	1.5
Nevada	8.9	2019	1	-	1.0
New York	4.4	2019	0.5	-	0.5

California topped the scoring in this metric again this year, earning the maximum of 3.0 points on savings from 11 products, including recent standards for pool pump replacement motors, and for the adoption of federal standards. New York made the list this year for its adoption of plumbing product standards for faucets and showerheads.

Leading and Trending States: Appliance and Equipment Efficiency Standards

California. Just months after the U.S. Department of Energy narrowed the scope of light bulbs subject to federal standards, the California Energy Commission (CEC) broadened the scope of the state's light bulbs standards to address those bulbs no longer covered under federal standards. (Federal legislation adopted in 2007 exempted California from federal preemption on general-service light bulb standards.) CEC also adopted standards for replacement pool pump motors and spray sprinkler bodies. The commission is currently conducting rulemakings for hearth products, irrigation controllers, certain linear fluorescent lamps, and commercial and industrial fans.

New York. In December 2019, Governor Andrew Cuomo signed Assembly Bill A2286, updating water efficiency standards for faucets, showerheads, toilets, urinals, and drinking fountains to EPA's WaterSense levels. The law makes New York the eighth state to adopt updated plumbing standards. It expects to reduce water use by 3.7 billion gallons in 2025, growing threefold to 11.3 billion gallons by 2035, equivalent to the annual water consumption of 160,000 New York households.

Oregon. In March 2020, Governor Kate Brown signed Executive Order 20-04, directing the Oregon Department of Energy to "establish and update energy efficiency standards for products at least to levels equivalent to the most stringent standards among West Coast jurisdictions." The order specifies 10 products for which standards have been adopted by other states and opens the door for more product standards to be added. The rulemaking, completed on August 28, 2020, includes a performance standard for grid-connected water heaters and efficiency standards for computers; commercial dishwashers, fryers, and steamers; high-CRI fluorescent lamps; showerheads; faucets; portable electric spas; residential ventilating fans; and water coolers. The standards require legislative approval.

Chapter 7. Conclusions

The impact of the COVID-19 pandemic on states' economies forced many clean energy plans to be put on hold for much of the year. While some states still managed to advance significant energy efficiency reforms, others faced stay-at-home orders and drastically altered utility operations, leaving energy efficiency contractors unable to access homes and businesses. These upheavals led to the loss of hundreds of thousands of clean energy jobs and stalled some significant legislative efforts (BW Partnership 2020).

Although the slowdown impacted all clean energy sectors, including the renewable energy and clean vehicles industries, the largest impacts were in energy efficiency, especially residential programs, which suspended at-home visits and weatherization services and experienced other drop-offs in customer participation. While some utilities mitigated the pandemic's impact by shifting resources toward programs like virtual home energy audits and improvements to building exteriors and vacant buildings, much uncertainty remains regarding long-term effects on the industry. Many state and local leaders tried to learn from the crisis and emerge with new tools for resiliency and efficiency, such as by increasing opportunities for remote work and adding and expanding spaces for biking and walking.

AMID CRISIS, STATES PLANT SEEDS FOR FUTURE PROGRESS

Despite these challenges, several states kicked off 2020 with a series of strong policy achievements before COVID-19 disrupted their legislative calendars. This progress came on the heels of a banner 2019, in which five states (Maine, Nevada, New Mexico, New York, and Washington), in addition to Washington, DC, and Puerto Rico, enacted 100% clean energy targets.[70]

In March Virginia joined them by enacting the state's Clean Economy Act, becoming the eighth state nationwide and first in the Southeast with a 100% clean energy goal, as well as only the second in the region with a binding energy efficiency resource standard for investor-owned utilities. The bill, which sets a 100% clean energy goal, requires that by 2025 Dominion and Appalachian Power achieve electric savings equivalent to 5% and 2% of sales, respectively. These targets, which roughly equate to the 15th-highest statewide goal among those with an EERS, would avoid more than 7 million metric tons of greenhouse gas emissions over four years and would further reduce emissions well into the future as installed measures continue to save energy.

New Jersey also marked a critical milestone in its efforts to scale up energy efficiency and deliver on robust energy savings goals established under its 2018 Clean Energy Act. Following many months of work by officials and stakeholders, the state's Board of Public Utilities issued an order establishing a framework of programs, including five-year savings targets that ramp up to 2.15% of electric use and 1.1% of natural gas use, among the highest in the nation. It also calls for specific provisions and enhanced incentives for low-income customers to ensure equitable access to programs for these communities. These programs,

[70] Prior to 2019, only California and Hawaii had committed to 100% clean energy goals.

planned for June 2021, will work in parallel with Governor Phil Murphy's recently released economy-wide Energy Master Plan, which lays out a pathway to 100% clean energy by 2050.

New York is also working toward ambitious climate goals and released important regulatory reforms this year. A January order established strong 3% electric savings targets for 2025, including robust targets for heat pumps and low-to-moderate-income programs. These efforts to dramatically scale up efficiency are an important part of achieving the mission of the 2019 Climate Leadership and Community Protection Act, which calls for net-zero carbon emissions by 2050.[71]

Meanwhile, a number of other states, such as Maryland, Nevada, and New Mexico, also reported growing levels of utility-sector savings. These states' efforts to scale up programs to meet efficiency targets are yielding positive results.

EFFICIENCY ADVOCATES WIN BIG ON NATIONAL MODEL ENERGY CODES

This year also delivered major improvements for efficiency in new construction with the release of the 2021 International Energy Conservation Code (IECC) that establishes minimum building energy performance standards. Following more than a year of work by a broad coalition of organizations, ICC voting members—including many cities and states—approved a code update to yield an estimated 10% or greater efficiency improvement in residential and commercial buildings.

Following a decade that saw very few efficiency improvements in the IECC, the new codes are an important achievement for advocates and consumers, securing improvements in lighting efficiency and first-time provisions for water heating equipment. The 2021 IECC also includes two new optional appendices to provide states and cities pathways to incorporate zero-energy performance requirements into their codes through a mix of aggressive yet achievable levels of energy efficiency and renewable energy like rooftop solar panels. This suite of additions represents a significant step forward toward decarbonizing the building sector. While there was also widespread support for provisions requiring electric vehicle and electric appliance readiness as well as increased water heater efficiency, these were ultimately removed by the ICC Board of Directors upon appeal as it was determined these changes were outside the current scope and intent of the IECC's energy provisions.

In addition, close to a dozen states and DC made significant progress towards strengthening efficiency standards for new construction at the state-level. These include many states in which the 2018 IECC has gone into effect in recent months, including Minnesota, New Jersey, New Mexico, New York, Vermont, and Delaware. The new 2021 IECC will offer these states and others further opportunity to ensure that new buildings lock-in low energy costs for generations of future residents.

STATES LEAD ON VEHICLE EMISSIONS AND ELECTRIFICATION

With the federal government moving to roll back Clean Car Standards, many states have taken vehicle efficiency into their purview by advancing tailpipe emissions regulations and

[71] See blog.aee.net/one-giant-leap-for-energy-efficiency-in-new-york.

accelerating the adoption of electric vehicles through incentives and charging infrastructure. More than a dozen states have followed California's lead by adopting the Golden State's vehicle emissions standards, and 12 states have adopted its zero-emission vehicle program. The number is set to continue to grow following announcements in late 2019 and 2020 by governors in Minnesota, New Mexico, and Nevada that their states will also adopt these standards.

States are increasingly prioritizing electric vehicles and the charging infrastructure needed to serve them. Most states have taken some level of action to support EV deployment, from customer incentives to planning to regulatory reforms. Examples include New Jersey's passage of S-2252, an ambitious law intended to meet the governor's commitment to have 330,000 electric cars on the state's roads by 2025; this law also authorizes an incentive program for both light-duty electric vehicles and at-home electric charging infrastructure. The bill calls for the electrification of the state's light-duty vehicle fleet by 2035 and moves NJ Transit toward zero-emission bus purchases by 2032 (New Jersey Office of the Governor 2020).

In February the California Public Utilities Commission released its draft Transportation Electrification Framework that would call on utilities to develop 10-year plans to expand electrification infrastructure throughout the state, including plans for managing increased grid load. The new process would help accelerate the state's progress toward its goals for 250,000 electric vehicle chargers along with 1.5 million ZEVs on California roads by 2025, and 5 million ZEVs by 2030.

Utah passed multiple important pieces of legislation to move ahead on vehicle electrification, including HB 259, which calls on the state transportation agency to develop a statewide plan for an electric vehicle charging network, including additional funding to address areas served by rural electric cooperatives. HB 396, also passed this year, authorizes Rocky Mountain Power to collect $50 million toward the buildout of its EV charging infrastructure, with additional provisions allowing the utility to update rate designs for EV charging customers (Utah Clean Energy 2020).

Other states and major utilities also continued to roll out electrification plans of their own in 2020, including Pacific Power in Oregon and Xcel Energy in Colorado. In addition, a number of states, such as Connecticut, Virginia, Missouri, and Wisconsin, continue to conduct EV needs assessments and evaluate the appropriate roles for utilities and private entities in building EV infrastructure (NCCETC 2020).

DATA LIMITATIONS

The scoring framework used in this report is our best attempt to represent a variety of efficiency metrics as a quantitative score. Any effort to convert state spending data, energy savings data, and adoption of best-practice policies across five policy areas into one state energy efficiency score has obvious limitations. One of the most pronounced constraints is access to recent, reliable data on the results of energy efficiency. Because many states capture relatively little data on energy efficiency policy efforts, often under varying reporting protocols, we used a best-practices approach to score some policy areas. However, the actual, measurable success of these codes in reducing energy consumption is unclear

without a way to verify implementation. As data become more readily available, we will continue to explore ways to incorporate a more quantitative assessment of compliance in future *Scorecard*s.

We face similar difficulty in scoring state-backed financing and incentive programs for energy efficiency investments. Though many states have seemingly robust programs aimed at residential and commercial consumers, not all are able to relay information on program budgets or the energy savings resulting from such initiatives. As a result, we can offer only a qualitative analysis of these programs. This lack of quantitative data is growing more pronounced as many states begin pouring financial resources into green banks. Without comparable results on dollars spent and rigorously evaluated energy savings, it is impossible to assess these programs with the same scrutiny that we bring to bear on utility programs.

POTENTIAL NEW METRICS

Looking ahead, we have described relevant potential future metrics or revisions to existing metrics in several chapters of this year's *State Scorecard*. While we believe our data collection and scoring methodology are comprehensive, there is always room for modifications. As the energy efficiency market continues to evolve and data become more available, we will continue to adjust each chapter's scoring metrics. Here we present some additional metrics that currently fall outside the scope of our report but nonetheless indicate important efficiency pathways.

In response to policy trends and feedback from subject matter experts, this year we added several new scoring categories intended to capture emerging state efforts around EV grid integration and building decarbonization. These include scoring that considers statewide numbers of publicly available charging stations, as well as zero-energy building projects. The goal of these metrics is to provide an approximate outcome-based assessment of the relative success of ongoing policy efforts.

As more states develop and undertake electrification plans in support of ever-strengthening clean energy goals, we plan to continue to develop the *Scorecard* to consider the role of efficiency programs in promoting the switch from fossil fuels to technologies powered by clean electricity. For example, as previewed in Chapter 2, ACEEE research has begun to track the status of current state policies and utility efficiency programs enabling fuel switching, particularly in cases where it is beneficial, enabling transitions from higher-cost, higher-emission fuel sources for heating to lower-cost, lower-emitting fuel sources. While the current utility policy landscape in this emerging field is complex and fragmented, our goal is to use the *Scorecard* to highlight the work of leading states to harmonize energy efficiency rules with electrification and accelerate the transition to a carbon-free future in a way that maximizes public benefits.

Finally, another important area of focus for ACEEE is the advancement of social equity principles in clean energy and efficiency policy and program design to ensure that the economic, health, and safety benefits of energy efficiency and clean energy reach all communities. Energy efficiency initiatives have typically not been adequately extended to marginalized and historically disadvantaged groups, nor to rural and low-income areas,

where energy burdens are disproportionately high. While the *Scorecard* currently addresses low-income household access to programs to a limited extent in several chapters, ACEEE plans to use the report in the future to call greater attention to broader efforts to embed equity in community engagement, decision making, and workforce development. Through our annual data collection this year, we sought information on these types of efforts, including needs assessments, barrier analyses, job training, and the adoption of internal protocols and metrics to evaluate the equity of policy outcomes. While we have yet to formally integrate these data and principles into our scoring framework, we hope to do so in the future. Meanwhile, we have included this information on our State and Local Policy Database as a resource for communities, policymakers, and utilities to help track emerging best practices.[72]

[72] See database.aceee.org/state/equity-workforce.

References

114th Congress. 2015. *FAST (Fixing America's Surface Transportation) Act*. Pub. L. No. 114-94, 129 Stat. 1312. Washington, DC: 114th Congress. www.govinfo.gov/content/pkg/PLAW-114publ94/html/PLAW-114publ94.htm.

AASHTO (American Association of State Highway and Transportation Officials). 2017. *Survey of State Funding for Public Transportation – Final Report 2017, Based on FY2015 Data*. Washington, DC: AASHTO. store.transportation.org/Item/PublicationDetail?ID=3743.

——. 2019. *Survey of State Funding for Public Transportation – Final Report 2019, Based on FY2017 Data*. Washington, DC: AASHTO. store.transportation.org/Item/PublicationDetail?ID=4179.

ACEEE. 2019. *State Energy Efficiency Resource Standards (EERS), May 2019*. Washington, DC: ACEEE. aceee.org/content/state-energy-efficiency-resource-standard-eers-activity.

——. 2020a. "Local Governments Vote Resoundingly for Improved Efficiency in National Model Energy Code." www.aceee.org/press/2020/01/local-governments-vote-resoundingly.

——. 2020b. "State and Local Policy Database." Accessed July. database.aceee.org/.

——. 2020c. *State Policies and Rules to Enable Beneficial Electrification in Buildings through Fuel Switching*. May 2020. Washington, DC: ACEEE. aceee.org/policy-brief/2020/04/state-policies-and-rules-enable-beneficial-electrification-buildings-through .

Athalye, R., D. Sivaraman, D. Elliott, B. Liu, and R. Bartlett. 2016. *Impacts of Model Building Energy Codes*. Prepared by Pacific Northwest National Laboratory. Washington, DC: DOE (Department of Energy). www.pnnl.gov/main/publications/external/technical_reports/PNNL-25611Rev1.pdf.

Atlas Public Policy. 2020. "EV Hub." atlasevhub.com.

Baatz, B., G. Relf, and M. Kelly. 2017. *Large Customer Opt-Out: An Ohio Example*. Washington, DC: ACEEE. aceee.org/research-report/u1706.

BEA (Bureau of Economic Analysis). 2020. "Gross Domestic Product by State, 2nd Quarter 2020." www.bea.gov/news/2020/gross-domestic-product-state-2nd-quarter-2020.

Bednar, D., T. Reames, and G. Keoleian. 2017. "The Intersection of Energy and Justice: Modeling the Spatial, Racial/Ethnic and Socioeconomic Patterns of Urban Residential Heating Consumption and Efficiency in Detroit, Michigan." *Energy and Buildings* 143: 25–34. doi.org/10.1016/j.enbuild.2017.03.028.

Berg, W., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, M. DiMascio, and C. Kallakuri. 2016. *The 2016 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1606.

Berg, W., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, M. DiMascio, and H. DeLucia. 2017. *The 2017 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1710.

Berg, W., S. Nowak, G. Relf, S. Vaidyanathan, E. Junga, M. DiMascio, and E. Cooper. 2018. *The 2018 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1808.

Berg, W., S. Vaidyanathan, E. Cooper, C. Perry, M. DiMascio, G. Relf, and C. Waters. 2019. *The 2019 State Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1908.

C2ES (Center for Climate and Energy Solutions). 2017. "ZEV Program." Accessed June. www.c2es.org/.

Cashin, S. 2004. *The Failures of Integration: How Race and Class Are Undermining the American Dream*. New York: PublicAffairs.

CEC (California Energy Commission). 2020. "2019 Building Energy Efficiency Standards." www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency.

CEE (Consortium for Energy Efficiency). 2012. "Efficiency Program Industry by State and Region Appendices." *2011 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2011.

——. 2013. "Efficiency Program Industry by State and Region Appendices." *2012 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2012.

——. 2014. "Efficiency Program Industry by State and Region Appendices." *2013 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2013.

——. 2015. "Efficiency Program Industry by State and Region Appendices." *2014 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2014.

——. 2016. "Efficiency Program Industry by State and Region Appendices." *2015 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2015.

——. 2017. "Efficiency Program Industry by State and Region Appendices." *2016 State of the Efficiency Program Industry Report*. Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2016.

——. 2018. "Efficiency Program Industry by State and Region Appendices." *2017 State of the Efficiency Program Industry.* Boston: CEE. library.cee1.org/content/efficiency-program-industry-state-and-region-appendices-2017.

Census Bureau. 2020. "Building Permits Survey." Accessed September. www.census.gov/construction/bps/stateannual.html.

CGC (Coalition for Green Capital). 2015. *Growing Clean Energy Markets with Green Bank Financing*. Washington, DC: CGC. alaskarenewableenergy.org/library/whitepaper-growing-clean-energy-markets-with-green-bank-financing/.

Cheslak, K. 2019. "Commercial Energy Codes Field Study Update." *2019 National Energy Codes Conference*. Washington, DC: DOE. www.energycodes.gov/sites/default/files/documents/NECC19_D2S1_Cheslak.pdf.

Chittum, A. 2011. *Follow the Leaders: Improving Large Customer Self-Direct Programs.* Washington, DC: ACEEE. aceee.org/research-report/ie112.

Cluett, R., and J. Amann. 2013. *Residential Energy Use Disclosure: A Review of Existing Policies.* Washington, DC: ACEEE. aceee.org/research-report/a131.

Cluett, R., J. Amann, and S. Ou. 2016. *Building Better Efficiency Programs for Low-Income Households*. Washington, DC: ACEEE. aceee.org/research-report/u1601.

Colorado Energy Office. 2019. *2019 Legislative Session Snapshot – May 2019.* Denver: Colorado Energy Office. drive.google.com/file/d/1CrPqenC929D_oEAxuzswAgzFFK25akRq/view.

deLaski, A., and J. Mauer. 2017. *Energy-Saving States of America: How Every State Benefits from National Appliance Standards*. Washington, DC: ACEEE. aceee.org/white-paper/energy-saving-states-america.

DOE (Department of Energy). 2008. "State Energy Program: Projects by Topic—What Are State and Local Government Facility Projects in the States?" www.energy.gov/eere/wipo/state-energy-program.

——. 2020a. "Alternative Fuels Data Center: Electric Vehicle Charging Station Locations." afdc.energy.gov/fuels/electricity_locations.html - /find/nearest?fuel=ELEC.

——. 2020b. "Alternative Fuels Data Center: State Laws and Incentives." www.afdc.energy.gov/afdc/laws/state.

——. 2020c. "Energy Efficiency Field Studies: Residential." www.energycodes.gov/compliance/residential-energy-code-field-study.

——. 2020d. "U.S. Department of Energy Combined Heat and Power Installation Database." doe.icfwebservices.com/chpdb.

Drehobl, A., and L. Ross. 2016. *Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities*. Washington, DC: ACEEE. aceee.org/research-report/u1602.

Drehobl, A., L. Ross, and R. Ayala. 2020. *How High Are Household Energy Burdens? An Assessment of National and Metropolitan Energy Burden across the U.S.* Washington, DC: ACEEE. www.aceee.org/research-report/u2006

DSIRE (Database of State Incentives for Renewables & Efficiency). 2020. "Database of State Incentives for Renewables & Efficiency®." Accessed June. dsireusa.org/.

Duke Energy. 2020. "Carolinas Integrated Resource Planning (IRP): IRP Reference Information Portal." duke-energy.com/our-company/irp?_ga=2.79225431.2107761014.1600283148-580623842.1600283148.

EDF (Environmental Defense Fund). 2018. *Low-Income Energy Efficiency: A Pathway to Clean, Affordable Energy for All*. Prepared by APPRISE (Applied Public Policy Research Institute for Study and Evaluation). New York: EDF. www.edf.org/sites/default/files/documents/liee_national_summary.pdf.

EECC (Energy-Efficient Codes Coalition). 2019. *Frequently Asked Questions (FAQs) about ICC's 2019 Code Cycle B and Updating the 2021 International Energy Conservation Code (IECC)*. Washington, DC: EECC. energyefficientcodes.org/wp-content/uploads/2019-01-10-FAQs-ICC-2021-IECC-FIN-Uploaded-to-website.pdf.

Efficiency Maine Trust. 2020. *Beneficial Electrification: Barriers and Opportunities in Maine*. Augusta: Efficiency Maine. www.efficiencymaine.com/docs/EMT_Beneficial-Electrification-Study_2020_1_31.pdf.

EIA (Energy Information Administration). 2019a. *Annual Energy Outlook 2019*. Washington, DC: EIA. https://www.eia.gov/outlooks/aeo/

——. 2019b. "Hawaii State Profile and Energy Estimates." www.eia.gov/state/?sid=HI.

——. 2020a. *Annual Energy Outlook 2020*. Washington, DC: EIA. www.eia.gov/outlooks/aeo/.

——. 2020b. "Annual Electric Power Industry Report, Form EIA-861 Detailed Data Files." www.eia.gov/electricity/data/eia861/.

——. 2020c. *EIA Monthly Energy Review*. Washington, DC: EIA. eia.gov/totalenergy/data/monthly/.

——. 2020d. "Natural Gas Annual Respondent Query System (EIA-176 Data through 2019)." www.eia.gov/cfapps/ngqs/ngqs.cfm?f_report=RP1.

——. 2020e. "Natural Gas: Number of Natural Gas Customers." www.eia.gov/dnav/ng/ng_cons_num_dcu_nus_a.htm.

Eldridge, M., R. Elliott, and S. Vaidyanathan. 2010. *North Carolina's Energy Future: Electricity, Water, and Transportation Efficiency.* Washington, DC: ACEEE. www.aceee.org/research-report/e102.

Eldridge, M., M. Neubauer, D. York, S. Vaidyanathan, A. Chittum, and S. Nadel. 2008. *The 2008 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. www.aceee.org/research-report/e086.

Eldridge, M., W. Prindle, D. York, and S. Nadel. 2007. *The State Energy Efficiency Scorecard for 2006.* Washington, DC: ACEEE. aceee.org/research-report/e075.

Eldridge, M., M. Sciortino, L. Furrey, S. Nowak, S. Vaidyanathan, M. Neubauer, N. Kaufman, A. Chittum, S. Black, C. Sheppard, C. Chamberlin, A. Jacobson, Y. Mugica, and D. Bryk. 2009. *The 2009 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. aceee.org/research-report/e097.

Eley, C. 2009. *Rethinking Percent Savings: The Problem with Percent Savings and the New Scale for a Zero Net–Energy Future.* Prepared by AEC (Architectural Energy Corporation). Rosemead: Southern California Edison. newbuildings.org/sites/default/files/Rethinking_Percent_Savings.pdf.

Elliott, R., M. Eldridge, A. Shipley, J. Laitner, S. Nadel, P. Fairey, R. Vieira, J. Sonne, A. Silverstein, B. Hedman, and K. Darrow. 2007a. *Potential for Energy Efficiency and Renewable Energy to Meet Florida's Growing Energy Demands.* Washington, DC: ACEEE. aceee.org/research-report/e072.

Elliott, R., M. Eldridge, A. Shipley, J. Laitner, S. Nadel, A. Silverstein, B. Hedman, and M. Sloan. 2007b. *Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Needs.* Washington, DC: ACEEE. aceee.org/research-report/e073.

EPA (Environmental Protection Agency). 2012. *ENERGY STAR® Portfolio Manager™ Data Trends: Benchmarking and Energy Savings.* Washington, DC: EPA. www.energystar.gov/sites/default/files/buildings/tools/DataTrends_Savings_20121002.pdf.

——. 2014. *Approaches to Streamline Air Permitting for Combined Heat and Power: Permits by Rule and General Permits.* Washington, DC: EPA. www.epa.gov/sites/production/files/2015-07/documents/approaches_to_streamline_air_permitting_for_combined_heat_and_power_permits_by_rule_and_general_permits.pdf.

——. 2015. "Clean Power Plan Final Rule." archive.epa.gov/epa/cleanpowerplan/clean-power-plan-existing-power-plants-regulatory-actions.html - CPP-final.

——. 2020a. "Combined Heat and Power (CHP) Partnership: dCHPP (CHP Policies and Incentives Database)." www.epa.gov/chp/dchpp-chp-policies-and-incentives-database.

——. 2020b. "Sources of Greenhouse Gas Emissions." epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

Faesy, R., L. Badger, E. Levin, D. Ferington, I. Finlayson, and J. Lano. 2014. "Residential Building Energy Scoring and Labeling: An Update from Leading States." *Proceedings of the 2014 ACEEE Summer Study on Energy Efficiency in Buildings* 2: 109–21. Washington, DC: ACEEE. aceee.org/files/proceedings/2014/data/papers/2-113.pdf.

Fazeli, S. 2016. *Accelerating the Commercial PACE Market: Statewide Programs and State Energy Office Participation in Property Assessed Clean Energy (PACE) Financing.* Arlington, VA: NASEO (National Association of State Energy Officials). www.naseo.org/data/sites/1/documents/publications/PACE%20May%202016.pdf.

FHWA (Federal Highway Administration). 2020. "Travel Monitoring: Traffic Volume Trends." www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm.

GDS Associates. 2013. *Michigan Electric and Natural Gas Energy Efficiency Potential Study: Final Report.* Lansing: Michigan PSC (Public Service Commission). www.michigan.gov/documents/mpsc/mi_ee_potential_study_rep_v29_439270_7.pdf.

Geller, H., S. Baldwin, P. Case, K. Emerson, T. Langer, and S. Wright. 2007. *Utah Energy Efficiency Strategy: Policy Options.* Boulder: SWEEP (Southwest Energy Efficiency Project). aceee.org/sites/default/files/pdf/collaborative-reports/UT%20EE%20Strategy%20Final%20Report%20-%2010-01-07.pdf.

Gilleo, A., M. Kushler, M. Molina, and D. York. 2015a. *Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms.* Washington, DC: ACEEE. aceee.org/sites/default/files/publications/researchreports/u1503.pdf.

Gilleo, A., S. Nowak, M. Kelly, S. Vaidyanathan, M. Shoemaker, A. Chittum, and T. Bailey. 2015b. *The 2015 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. aceee.org/research-report/u1509.

Gilleo, A., B. Stickles, and C. Kramer. 2016. *Green Bank Accounting: Examining the Current Landscape and Tallying Progress on Energy Efficiency.* Washington, DC: ACEEE. aceee.org/research-report/f1602.

Gold, R., A. Gilleo, and W. Berg. 2019. *Next-Generation Energy Efficiency Resource Standards.* Washington, DC: ACEEE. aceee.org/research-report/u1905.

Haeri, H., and M. Khawaja. 2012. "The Trouble with Freeriders: The Debate about Freeridership in Energy Efficiency Isn't Wrong, but It Is Wrongheaded." *Public Utilities Fortnightly*, March. fortnightly.com/fortnightly/2012/03/trouble-freeriders.

Hawaii PUC (Public Utilities Commission). 2019. *Summary of Phase I Decision & Order Establishing a PBR Framework.* Honolulu: Hawaii PUC. puc.hawaii.gov/wp-content/uploads/2019/05/PBR-Phase-1-DO-3-Page-Summary.05-23-2019.Final_.pdf.

Hayes, S., G. Herndon, J. Barrett, J. Mauer, M. Molina, M. Neubauer, D. Trombley, and L. Ungar. 2014. *Change Is in the Air: How States Can Harness Energy Efficiency to Strengthen the Economy and Reduce Pollution*. Washington, DC: ACEEE. aceee.org/research-report/e1401.

Hibbard, P., S. Tierney, P. Darling, and S. Cullinan. 2018. *The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States: Review of RGGI's Third Three-Year Compliance Period (2015–2017)*. Boston: Analysis Group. www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_april_2018.pdf.

Hudson, B. 2020. "Minneapolis Now Requires Energy Disclosure Reports on Homes for Sale." *CBS Minnesota,* January 15. minnesota.cbslocal.com/2020/01/15/minneapolis-now-requires-energy-disclosure-reports-on-homes-for-sale/.

ICC (International Code Council). 2020. "Appeals on Committee Reconsideration and Preemption Concluded." www.iccsafe.org/about/periodicals-and-newsroom/icc-pulse/appeals-on-committee-reconsideration-and-preemption-concluded/.

IHS Automotive Polk. 2020. "Electric Vehicle Registration Dataset." Accessed April.

IMT (Institute for Market Transformation). 2020. *U.S. City and County Policies for Existing Buildings: Benchmarking, Transparency, and Beyond*. Washington, DC: IMT. imt.org/resources/map-u-s-city-and-county-benchmarking-policies-for-existing-private-buildings/.

Jargowsky, P. 2015. *Architecture of Segregation: Civil Unrest, the Concentration of Poverty, and Public Policy*. New York: Century Foundation. community-wealth.org/content/architecture-segregation-civil-unrest-concentration-poverty-and-public-policy.

Jordan, P. 2020. *Memorandum: Clean Energy Employment Initial Impacts from the COVID-19 Economic Crisis, April 2020*. Wrentham, MA: BW Research Partnership. e2.org/wp-content/uploads/2020/05/Clean-Energy-Jobs-April-COVID-19-Memo-FINAL.pdf.

Kenney, M., H. Bird, and H. Rosales. 2019. *2019 California Energy Efficiency Action Plan*. Sacramento: California Energy Commission. efiling.energy.ca.gov/GetDocument.aspx?tn=231261&DocumentContentId=62916.

Landry, R. 2019. "DOE Low-Rise Multifamily Energy Code Field Studies—Unboxing Compliance: What We've Learned from Three Years of Field Study Data." *2019 National Energy Codes Conference*. Washington, DC: DOE. www.energycodes.gov/sites/default/files/documents/NECC19_D2S1_Landry.pdf.

Lunetta, M. 2018. "Don't Be Fooled: Annual Fees on Electric Vehicle Drivers Are Not 'Fair.'" *Sierra Club,* April 2. www.sierraclub.org/compass/2018/04/don-t-be-fooled-annual-fees-electric-vehicle-drivers-are-not-fair.

Lutsey, N., and P. Slowik. 2019. *States and Cities Seek to Keep Clean Car Standards.* Washington, DC: ICCT. www.theicct.org/publications/fact-sheet-state-city-clean-car-20190419.

Mauer, J., A. deLaski, and M. DiMascio. 2017. *States Go First: How States Can Save Consumers Money, Reduce Energy and Water Waste, and Protect the Environment with New Appliance Standards.* Washington, DC: ACEEE. aceee.org/research-report/a1702.

Mims, N., S. Schiller, E. Stuart, L. Schwartz, C. Kramer, and R. Faesy. 2017. *Evaluation of U.S. Building Energy Benchmarking and Transparency Programs: Attributes, Impacts, and Best Practices.* Prepared by Berkeley Lab. Washington, DC: DOE. emp.lbl.gov/sites/default/files/lbnl_benchmarking_final_050417_0.pdf.

Minnesota DOC (Department of Commerce). 2018. *Minnesota Energy Efficiency Potential Study: 2020–2029.* Prepared by CEE (Center for Energy and the Environment), Optimal Energy, and Seventhwave. St. Paul: Minnesota DOC. mncee.org/MNCEE/media/PDFs/MN-Potential-Study_Final-Report_Publication-Date_2018-12-04.pdf.

Misuriello, H., S. Kwatra, M. Kushler, and S. Nowak. 2012. *Building Energy Code Advancement through Utility Support and Engagement.* Washington, DC: ACEEE. www.aceee.org/research-report/a126.

Molina, M., R. Gold, G. Calcagni, E. Belliveau, and S. Cowell. "Implementing Fuel-Neutral Goals: A Progress Report from Massachusetts and New York." *Proceedings of the 2020 ACEEE Summer Study on Energy Efficiency in Buildings.* Washington, DC: ACEEE.

Molina, M., S. Watson, N. Kaufman, J. Laitner, E. Mackres, D. Trombley, D. York, M. Hagenstad, S. Schare, D. Violette, A. Gulkis, C. Metz, and G. Gawor. 2011. *Missouri's Energy Efficiency Potential: Opportunities for Economic Growth and Energy Sustainability.* Washington, DC: ACEEE. aceee.org/research-report/e114.

Mosenthal P., S. Bower, D. Trombley, D. Hill, and N. Lange. 2014. *Energy Efficiency and Renewable Energy Potential Study of New York State – Volume 1: Study Overview.* Prepared by Optimal Energy, ACEEE, and Vermont Energy Investment Corporation. Albany: NYSERDA (New York State Energy Research and Development Authority). www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-Prices/Energy-Statistics/14-19-EE-RE-Potential-Study-Vol1.pdf.

MPSC (Michigan Public Service Commission). 2019. "Gov. Whitmer Partners with MPSC in Launch of MI Power Grid to Help Guide Michigan through Transition to Clean Energy." michigan.gov/mpsc/0,9535,7-395-93307_93313_17280-510217--,00.html.

Nadel, S. 2016. *Pathway to Cutting Energy Use and Carbon Emissions in Half.* Washington, DC: ACEEE. aceee.org/white-paper/pathways-cutting-energy-use.

——. 2017. *Natural Gas Energy Efficiency: Progress and Opportunities.* Washington, DC: ACEEE. aceee.org/research-report/u1708.

——. 2019. "Deep Retrofits: Financing Needs to Play a Critical Role." *ACEEE Blog*, May 14. www.aceee.org/blog/2019/05/deep-retrofits-financing-needs-play

Nadel, S., and A. Hinge. 2020. *Mandatory Building Performance Standards: A Key Policy for Achieving Climate Goals*. Washington, DC: ACEEE. www.aceee.org/white-paper/2020/06/mandatory-building-performance-standards-key-policy-achieving-climate-goals.

Nadel, S., and C. Kubes. 2019. *State and Provincial Efforts to Put a Price on Greenhouse Gas Emissions, with Implications for Energy Efficiency*. Washington, DC: ACEEE. aceee.org/white-paper/carbon-tax-010319.

Nadel, S., and L. Ungar. 2019. *Halfway There: Energy Efficiency Can Cut Energy Use and Greenhouse Gas Emissions in Half by 2050*. Washington, DC: ACEEE. aceee.org/research-report/u1907.

Nadel, S., T. Kubo, and H. Geller. 2000. *State Scorecard on Utility Energy Efficiency Programs*. Washington, DC: ACEEE. aceee.org/research-report/u004.

NASEO (National Association of State Energy Officials). 2020. "Energy Metrics to Promote Residential Energy Scorecards in States (EMPRESS)." naseo.org/home-energy-labeling/empress.

NBI (New Buildings Institute). 2019. "Getting to Zero Building Database Online Tool." newbuildings.org/resource/getting-to-zero-database/.

——. 2020. "2020 Getting to Zero Buildings List." newbuildings.org/resource/2020-getting-to-zero-project-list/.

NCCETC (NC Clean Energy Technology Center). 2020. *50 States of Electric Vehicles: Q2 Quarterly Report*. Raleigh: NCCETC. nccleantech.ncsu.edu/2020/08/05/the-50-states-of-electric-vehicles-states-evaluating-charging-infrastructure-needs-and-ownership-models-in-q2-2020/.

NCSC (National Complete Streets Coalition). 2012. *Complete Streets and High Gas Prices*. Washington, DC: Smart Growth America. smartgrowthamerica.org/.

——. 2018. *The Best Complete Streets Initiatives of 2017*. Washington, DC: Smart Growth America. smartgrowthamerica.org/resources/best-complete-streets-initiatives-2017/.

NCSFA (National Conference of State Fleet Administrators). 2007. *NCSFA Target Membership Estimated Fleet Totals and Dollars (Reported by State Fleets)*. Gaithersburg, MD: NCSFA. www.ncsfa.net/.

NEEP (Northeast Energy Efficiency Partnerships). 2019. "Home Energy Labeling Information Exchange (HELIX)." www.neep.org/home-energy-labeling-information-exchange-helix.

Neubauer, M., S. Nadel, J. Talbot, A. Lowenberger, D. Trombley, S. Black, N. Kaufman, S. Vaidyanathan, B. Foster, J. Laitner, M. Hagenstad, D. Violette, S. Schare, D. White, and R. Hornby. 2011. *Advancing Energy Efficiency in Arkansas: Opportunities for a Clean Energy Economy*. Washington, DC: ACEEE. www.aceee.org/content/ee-arkansas.

Neubauer, M., S. Watson, J. Laitner, J. Talbot, D. Trombley, A. Chittum, S. Black, and L. Furrey. 2009. *South Carolina's Energy Future: Minding Its Efficiency Resources*. Washington, DC: ACEEE. aceee.org/research-report/e099.

Nevada Office of the Governor. 2019. *Executive Order 2019-22: Order Directing Executive Branch to Advance Nevada's Climate Goals*. Carson City: Nevada Office of the Governor. gov.nv.gov/News/Executive_Orders/2019/Executive_Order_2019-22_Directing_Executive_Branch_to_Advance_Nevada_s_Climate_Goals/.

New Jersey Office of the Governor. 2019. "Governor Murphy Announces Adoption of Rules Returning New Jersey to Regional Greenhouse Gas Initiative." www.nj.gov/governor/news/news/562019/approved/20190617a.shtml.

——. 2020. "Governor Murphy Signs Legislation Establishing Statewide Goals and Incentives for Increased Use of Electric Vehicles and Charging Infrastructure." nj.gov/governor/news/news/562020/20200117b.shtml.

New York City Council. 2019. "Climate Mobilization Act." council.nyc.gov/data/green/.

New York Office of the Governor. 2020. "Governor Cuomo Announces Clean Energy Investments to Benefit over 350,000 Low-to-Moderate Income Households." www.governor.ny.gov/news/governor-cuomo-announces-clean-energy-investments-benefit-over-350000-low-moderate-income.

Nowak, S., B. Baatz, A. Gilleo, M. Kushler, M. Molina, and D. York. 2015. *Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency*. Washington, DC: ACEEE. aceee.org/beyond-carrots-utilities-national-review.

Nowak, S., M. Kushler, M. Sciortino, D. York, and P. Witte. 2011. *Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings*. Washington, DC: ACEEE. aceee.org/research-report/u113.

NRDC (Natural Resources Defense Council). 2020. "Race to 100% Clean." www.nrdc.org/resources/race-100-clean.

NYSERDA (New York State Energy Research and Development Authority). 2020. "NY Green Bank Announces Strongest Quarter to Date, Committing More Capital in Fourth Quarter of 2019 than Any Other Quarter." www.nyserda.ny.gov/About/Newsroom/2020-Announcements/2020-02-14-NY-Green-Bank-Announces-Strongest-Quarter-to-Date-Committing-More-Capital-in-Fourth-Quarter-of-2019-Than-Any-Other-Quarter.

Oregon Office of the Governor. 2017. Executive Order No. 17-20: Accelerating Efficiency in Oregon's Built Environment to Reduce Greenhouse Gas Emissions and Address Climate Change. Salem: Oregon. www.oregon.gov/gov/Documents/executive_orders/eo_17-20.pdf.

——. 2020. *Executive Order No. 20-04: Directing State Agencies to Take Actions to Reduce and Regulate Greenhouse Gas Emissions*. Salem: Oregon Office of the Governor. www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf.

PACENation (Property Assessed Clean Energy Nation). 2020a. "PACE Programs." Accessed September. pacenation.org/pace-programs.

——. 2020b. "PACE Market Data." Accessed July. www.pacenation.us/pace-market-data.

Pennsylvania Office of the Governor. 2019. *Executive Order No. 2019-07: Commonwealth Leadership in Addressing Climate Change through Electric Sector Emissions Reductions.* Harrisburg: Pennsylvania Office of the Governor. www.governor.pa.gov/wp-content/uploads/2019/10/Executive-Order-2019-07-Commonwealth-Leadership-in-Addressing-Climate-Change-through-Electric-Sector-Emissions-Reductions.pdf.

Pew Charitable Trusts. 2016. *Household Expenditures and Income: Balancing Family Finances in Today's Economy*. Philadelphia: Pew Charitable Trusts. www.pewtrusts.org/~/media/assets/2016/03/household_expenditures_and_income.pdf.

Reames, T., B. Stacey, and M. Zimmerman. 2019. *A Multi-State Analysis of Equity in Utility-Sponsored Energy Efficiency Investments for Residential Electric Customers*. Ann Arbor: University of Michigan. poverty.umich.edu/files/2019/05/Energy_efficiency.pdf.

RESNET (Residential Energy Services Network). 2020. *2019 HERS Activity by State.* Oceanside, CA: RESNET. resnet.us/wp-content/uploads/2019-HERS-Activity-by-State.pdf.

RGGI (Regional Greenhouse Gas Initiative). 2018. *The Investment of RGGI Proceeds in 2016.* New York: RGGI. rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2016.pdf.

Ribeiro, D., V. Hewitt, E. Mackres, R. Cluett, L. Ross, S. Vaidyanathan, and S. Zerbonne. 2015. *The 2015 City Energy Efficiency Scorecard*. Washington, DC: ACEEE. aceee.org/research-report/u1502.

Ribeiro, D., S. Samarripas, K. Tanabe, A. Jarrah, H. Bastian, A. Drehobl, S. Vaidyanathan, E. Cooper, B. Jennings, and N. Henner. 2020. *The 2020 City Clean Energy Scorecard.* Washington, DC: ACEEE. aceee.org/research-report/u2008.

Samarripas, S., and D. York. 2019. *Closing the Gap in Energy Efficiency Programs for Affordable Multifamily Housing*. Washington, DC: ACEEE. aceee.org/research-report/u1903.

Sciortino, M., M. Neubauer, S. Vaidyanathan, A. Chittum, S. Hayes, S. Nowak, M. Molina, C. Sheppard, A. Jacobson, C. Chamberlin, and Y. Mugica. 2011. *The 2011 State Energy Efficiency Scorecard.* Washington, DC: ACEEE. aceee.org/research-report/e115.

Shoemaker, M., and D. Ribeiro. 2018. *Through the Local Government Lens: Developing the Energy Efficiency Workforce.* Washington, DC: ACEEE. aceee.org/research-report/u1805.

Shoemaker, M., R. Ayala, and D. York. 2020. *Expanding Opportunity through Energy Efficiency Jobs: Strategies to Ensure a More Resilient, Diverse Workforce.* Washington, DC: ACEEE. aceee.org/research-report/u2010.

State of Michigan. 2019. "MI Power Grid." michigan.gov/mpsc/0,9535,7-395-93307_93312_93593---,00.html.

State of Nevada Public Utilities Commission. Docket: 19-06008. Accessed August 2020. pucweb1.state.nv.us/PUC2/Dktinfo.aspx?Util=All

Stradling, R. 2019. "Hybrid Owners Would Pay New Annual Fee under NC Bill, and Electric Car Owners Would Pay More." *The News & Observer*, April 10. www.newsobserver.com/news/politics-government/article229072449.html.

Stuart, E., P. Larsen, J. Carvallo, C. Goldman, and D. Gilligan. 2016. *U.S. Energy Service Company (ESCO) Industry: Recent Market Trends.* Prepared by Berkeley Lab. Washington, DC: DOE. emp.lbl.gov/sites/default/files/esco_recent_market_trends_30sep2016_1.pdf.

Tomich, J. 2019. "Some Fear Wave of EV Fees Might Swamp Emission Goals." *E&E News*, March 11. www.eenews.net/stories/1060126901.

Tonn, B., D. Carroll, S. Pigg, M. Blasnik, G. Dalhoff, J. Berger, E. Rose, B. Hawkins, J. Eisenberg, F. Ucar, I. Bensch, and C. Cowan. 2014. *Weatherization Works – Summary of Findings from the Retrospective Evaluation of the U.S. Department of Energy's Weatherization Assistance Program.* Prepared by Oak Ridge National Laboratory. Washington, DC: DOE. weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNL_TM-2014_338.pdf.

Utah Clean Energy. "2020 Utah Legislative Session Recap," February 27, 2020.

Virginia General Assembly. 2020. *Electric Utility Regulation; Environmental Goals – SB 851.* Richmond: Virginia General Assembly. lis.virginia.gov/cgi-bin/legp604.exe?201+ful+SB851ER+pdf.

Williams, J. 2019. "Single-family Residential Field Study: Phase III Data and Findings." *2019 National Energy Codes Conference.* Washington, DC: DOE. www.energycodes.gov/sites/default/files/documents/NECC19_D2S1_Williams.pdf.

York, D., and M. Kushler. 2002. *State Scorecard on Utility and Public Benefits Energy Efficiency Programs: An Update.* Washington, DC: ACEEE. aceee.org/research-report/u023.

——. 2005. *ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update of State-Level Activity.* Washington, DC: ACEEE. aceee.org/research-report/u054.

——. 2011. *The Old Model Isn't Working: Creating the Energy Utility for the 21st Century.* Washington, DC: ACEEE. www.aceee.org/content/old-model-isn't-working-creating-energy-utility-21st-century.

York, D., C. Cohn, and M. Kushler. 2020. *National Survey of State Policies and Practices for Energy Efficiency Program Evaluation.* Washington, DC: ACEEE. aceee.org/research-report/u2009.

Appendix A. Respondents to Utility and State Energy Office Data Requests

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Alabama	Maureen Neighbors, Director, and Susan Fleeman, Energy Division, Alabama Department of Economic and Community Affairs	—
Alaska	Jimmy Ord, Energy Program Information Manager, Alaska Housing Finance Corp.	—
Arizona	—	—
Arkansas	—	Jane Carpenter, Rate Case Analyst, Arkansas Public Service Commission
Bonneville Power Administration	—	Adam Morse, Bonneville Power Administration
California	Bill Pennington, Deputy Division Chief, Efficiency and Renewable Energy Division, California Energy Commission	Amanda Jordan Christenson, Energy Efficiency Analyst, California Public Utilities Commission
Colorado	Andrew Sand, Deputy Director, Colorado Energy Office	—
Connecticut	Michele Melley, Associate Research Analyst, Connecticut Department of Energy and Environmental Protection	Michele Melley, Associate Research Analyst, Connecticut Department of Energy and Environmental Protection
Delaware	Jessica Quinn, Renewable Energy Planner, Delaware Division of Energy & Climate	Jessica Quinn, Renewable Energy Planner, Delaware Division of Energy & Climate
District of Columbia	Ben Plotzker, EM&V Project Manager, Vermont Energy Investment Corporation	Ben Plotzker, EM&V Project Manager, Vermont Energy Investment Corporation
Florida	April Groover Combs, Senior Management Analyst, Office of Energy, Florida Department of Agriculture and Consumer Services	Michael Barrett, Economic Supervisor, Conservation, Florida Public Service Commission
Georgia	Kristofer Anderson, Senior Program Manager, Georgia Environmental Finance Authority	Jamie Barber, Director, Energy Efficiency and Renewable Energy Unit, Georgia Public Service Commission
Hawaii	Gail Suzuki-Jones, Energy Efficiency & Renewable Energy Program Manager, Hawaii State Energy Office	Ashley Norman, Utility Analyst, Hawaii Public Utilities Commission
Idaho	Katie Pegan, Policy Analyst, Idaho Governor's Office of Energy and Mineral Resources	—
Illinois	—	David Brightwell, Economist, Illinois Commerce Commission
Indiana	—	—
Iowa	Shelly Peterson, Program Manager, Iowa Economic Development Authority	Donald Tormey, Iowa Utilities Board
Kansas	—	—

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Kentucky	—	—
Louisiana	—	Kathryn Bowman Louisiana Public Service Commission
Maine	Dan Burgess, Director, and Melissa Winne, Energy Policy Analyst, Governor's Energy Office	Jack Riordan, Strategic Initiatives, Efficiency Maine
Maryland	Jenn Gallicchio, Assistant Director of Energy Programs, Maryland Energy Administration	—
Massachusetts	Lyn Huckabee, Residential Energy Efficiency Program Coordinator, Massachusetts Department of Energy Resources	Lyn Huckabee, Residential Energy Efficiency Program Coordinator, Massachusetts Department of Energy Resources
Michigan	Julie Staveland, SEP Specialist, Michigan Energy Office	Fawzon Tiwana, Economic Analyst, Michigan Public Service Commission
Minnesota	Anthony Fryer, Conservation Improvement Program Coordinator, Minnesota Department of Commerce	Anthony Fryer, Conservation Improvement Program Coordinator, Minnesota Department of Commerce
Mississippi	Ethan Cartwright, Energy Efficiency Program Manager, Mississippi Development Authority	Vicki Munn, Electric, Gas & Communications Division, Mississippi Public Utilities Staff
Missouri	Cherylyn Kelley, Energy Policy Analyst, Missouri Department of Economic Development	Brad Fortson, Manager, Energy Resources Department, Missouri Public Service Commission
Montana	Kyla Maki, Montana Department of Environmental Quality	Robin Arnold, Policy Analyst, Montana Public Service Commission
Nebraska	Joe Francis, Associate Director, Nebraska Department of Environment and Energy	Marc Shkolnick, Manager of Energy Services, Lincoln Electric System
Nevada	Robin Yochum, Energy Program Manager, Nevada Governor's Office of Energy	Cristina Zuniga, Economist, Nevada Public Utility Commission
New Hampshire	Alexis LaBrie, Energy Analyst, New Hampshire Office of Strategic Initiatives	—
New Jersey	Kelly Mooij, Deputy Director, New Jersey Board of Public Utilities	Kelly Mooij, Deputy Director, New Jersey Board of Public Utilities
New Mexico	Harold Trujillo, Bureau Chief, Energy Technology and Engineering, New Mexico Energy Office	John Reynolds, New Mexico Public Regulation Commission
New York	Robert Bergen, New York State Energy Research and Development Authority (NYSERDA)	Robert Bergen, New York State Energy Research and Development Authority (NYSERDA)
North Carolina	Russell Duncan, Energy Assurance Manager, North Carolina Department of Environmental Quality	Jack Floyd, Engineer, Electric Division, Public Staff, North Carolina Utilities Commission

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
North Dakota	Bruce Hagen, Weatherization Program Manager, North Dakota Department of Commerce	—
Ohio	Deborah Ohler, Staff Engineer, Division of Industrial Compliance, Ohio Department of Commerce	—
Oklahoma	Katie DeMuth, Energy Policy Advisor and Legislative Affairs Director, Office of the Secretary of Energy and Environment	Kathy Champion, Regulatory Analyst, Oklahoma Corporation Commission
Oregon	Warren Cook, Manager, Energy Efficiency and Conservation, Oregon Department of Energy	Warren Cook, Manager, Energy Efficiency and Conservation, Oregon Department of Energy; Michael Freels, Energy Analyst, Oregon Department of Energy
Pennsylvania	Libby Dodson, Energy Program Specialist, Department of Environmental Protection	Joseph Sherrick, Supervisor, Policy and Planning, Pennsylvania Public Utility Commission
Rhode Island	Nathan Cleveland, Energy Efficiency Policy and Program Manager, Rhode Island Office of Energy Resources	—
South Carolina	—	Jocelyn Boyd, Chief Clerk, South Carolina Public Service Commission
South Dakota	—	Darren Kearney, Utility Analyst, South Dakota Public Utilities Commission
Tennessee	Shauna Basques, Office of Energy Programs, Tennessee Department of Environment and Conservation	Erik Franey, Specialist, Commercial Energy Solutions, Tennessee Valley Authority
Texas	Erik Funkhouser, Program Contract Manager, State Energy Conservation Office	—
Utah	Brooke Tucker, Deputy Director, Governor's Office of Energy Development	Carol Revelt, Executive Staff Director, Utah Public Service Commission
Vermont	Kelly Launder, Assistant Director, and Barry Murphy, Energy Efficiency Program Specialist, Vermont Public Service Department	Kelly Launder, Assistant Director, and Barry Murphy, Energy Efficiency Program Specialist, Vermont Public Service Department
Virginia	Barbara Simcoe, State Energy Program Manager, Virginia Division of Energy, Department of Mines, Minerals, and Energy	—
Washington	Emily Salzberg, Managing Director, Building Standards and Performance, Washington State Department of Commerce Karin Landsberg, Senior Policy Specialist, Washington State Department of Transportation	—
West Virginia	Tiffany Bailey, Energy Development Specialist, West Virginia Division of Energy	Karen Hall, Public Information Specialist, Public Service Commission of West Virginia

State	Primary state energy office data request respondent	Primary public utility commission data request respondent
Wisconsin	—	Jolene Sheil, Focus on Energy Performance Manager, Public Service Commission of Wisconsin
Wyoming	Sarah Young Director, Public Affairs & Communications Wyoming Energy Authority	—

Appendix B. Electric Efficiency Program Spending per Capita

State	2019 electric efficiency spending ($ million)	$ per capita
Rhode Island	104.1	98.24
Massachusetts	620.4	90.02
Vermont	55.2	88.46
Maryland	275.6	45.58
Connecticut	161.4	45.28
California	1516.4	38.38
Oregon	161.5	38.28
New Hampshire	48.6	35.74
Idaho	61.4	34.37
Illinois	433.8	34.23
Maine	45.9	34.12
New York	645.2	33.17
Hawaii	42.0	29.66
Minnesota	157.0	27.84
Michigan	250.7	25.10
Washington	190.7	25.05
Iowa	75.6	23.95
Arkansas	68.0	22.52
District of Columbia	15.4	21.79
Colorado	108.0	18.75
Delaware	17.9	18.41
Wyoming	10.2	17.66
Oklahoma	68.6	17.34
Pennsylvania	197.5	15.43
Indiana	101.8	15.12
New Mexico	31.7	15.12
Ohio	175.0	14.97

State	2019 electric efficiency spending ($ million)	$ per capita
Nevada	45.3	14.71
Utah	47.1	14.69
Missouri	85.8	13.98
North Carolina	145.8	13.90
New Jersey	123.0	13.85
Wisconsin	79.0	13.57
Montana	14.4	13.44
South Carolina	64.0	12.43
Arizona	82.4	11.32
Texas	196.2	6.77
Kentucky	27.2	6.09
Mississippi	17.1	5.74
Georgia	57.0	5.37
South Dakota	4.7	5.31
Louisiana	24.6	5.29
Florida	105.4	4.91
West Virginia	7.6	4.24
Virginia	31.7	3.72
Nebraska	7.1	3.65
Tennessee	19.2	2.81
Alabama	7.7	1.57
North Dakota	0.2	0.20
Kansas	0.3	0.11
Alaska	0.0	0.03
U.S. total	**6,832.4**	
Median	**64.0**	**15.12**

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Appendix C. Large-Customer Self-Direct Programs by State

State	Availability	Description
Arizona	Customers of Arizona Public Service Company (APS), Tucson Electric Power Company (TEP), and Salt River Project (SRP)	APS: Large customers using at least 40 million kWh per calendar year can elect to self-direct energy efficiency funds. Customers must notify APS each year if they wish to participate, after which 85% of the customer's demand-side management contribution will be reserved for future energy efficiency projects. Projects must be completed within two years. Self-direct funds are paid once per year, once the project is completed and verified by APS. TEP: To be eligible for self-direct, a customer must use a minimum of 35 million kWh per calendar year. SRP: SRP makes self-direct available only to very large customers using more than 240 million kWh per year. For all utilities, a portion of the funds that customers would have otherwise contributed to energy efficiency is retained to cover self-direct program administration, management, and evaluation costs.
Colorado	Customers of Xcel Energy and Black Hills	Xcel: The self-direct program is available to commercial and industrial (C&I) electric customers who have an aggregated peak load of at least 2 MW in any single month and an aggregated annual energy consumption of at least 10 GWh. Self-direct program customers cannot participate in other conservation products offered by the company. Rebates are paid based on actual savings from a project, up to $525 per customer kW or $0.10 per kWh. Rebates are given for either peak demand or energy savings, but not both, and are limited to 50% of the incremental cost of the project. Xcel uses raw monitoring results and engineering calculations to demonstrate actual energy and demand savings. Black Hills: To participate in the C&I self-direct program, customers must have an aggregated peak load greater than 1 MW in any single month and aggregated annual energy usage of 5,000 MWh. Rebates and savings are calculated on a case-by-case basis, with rebate values calculated as either 50% of the incremental cost of the project or $0.30 per kWh savings, whichever is lower.
Idaho	Customers of Idaho Power	Idaho Power offers its largest customers an option to self-direct the 4% energy efficiency rider that appears on all customers' bills. Customers have three years to complete projects, with 100% of the funds available to fund up to 100% of project costs. Self-direct projects are subject to the same criteria as projects in other efficiency programs.
Illinois	Statewide	Electric customers with greater than 10 MW of demand in any 30-minute period are exempt from programs. A self-direct option is available statewide for natural gas customers who meet the following criteria: annual natural gas usage in the aggregate of 4 million therms or more within the service territory of the affected gas utility, or with aggregate usage of 8 million therms or more in the state and using natural gas as feedstock to the extent such annual feedstock usage is greater than 60% of the customer's total annual usage of natural gas. Qualified natural gas customers put money into an account of their own that amounts to the lesser of 2% of the customer's cost of natural gas or $150,000. The funds are required to be used for energy efficiency projects. No evaluation is required.

State	Availability	Description
Michigan	Statewide	Self-direct is available statewide. Customers must have had an annual peak demand in the preceding year of at least 1 megawatt in the aggregate at all sites. Customers may use the amount of funds that would otherwise have been paid to the utility provider for energy efficiency programs. They must, however, submit the portion of the EE funds that would have been collected and used for low-income programs to their utility provider. They then calculate the energy savings achieved and provide it to their utility provider. In 2018, there were 15 customers self-directing.
Minnesota	Statewide	Minnesota offers a self-direct option, with a full exemption from assigned cost-recovery mechanism (CRM) fees, to customers with 20 MW average electric demand or 500,000 Mcf of gas consumption. Customers must also show that they are making "reasonable" efforts to identify or implement energy efficiency and that they are subject to competitive pressures that make it helpful for them to be exempted from the CRM fees. Participating customers must submit new reports every five years to maintain exempt status. The utility is not involved in self-direct program administration; the state Department of Commerce manages self-direct accounts and is the arbiter of whether a company qualifies for self-direct and is satisfying its obligations.
Montana	Statewide (all regulated public utilities)	Self-direct is available statewide in regulated utility service territory. About 90% of the population is served by NorthWestern Energy. NorthWestern Energy allows customers with demand larger than 1 MW to channel their cost-recovery mechanism (CRM) funds to an escrow account that repays them on a quarterly basis for completed self-direct projects. The annual maximum contribution is $500,000, and companies have two years to use their funds before they are returned to the larger pool of CRM revenues. NorthWestern administers the funds but provides no measurement or verification. Self-direct customers file annual reports with the Montana Department of Revenue. The department publishes these reports, and a public "challenge" process is provided for as the only scrutiny or review. About 60 customers use self-direct, approximately 89% of eligible large customers.
New Jersey	Statewide	A Societal Benefits Credit (SBC) program, with elements of a self-direct program, allows commercial and industrial ratepayers to establish a credit against their SBC contributions. No company has implemented an SBC program to date. The credit would be equal to one-half of the costs incurred for the purchase and installation of Clean Energy Program–supported energy efficiency products and services in the preceding calendar year, and up to 50% of the SBC contributions for a given year, per utility account. The Large Energy Users Program is designed to promote self-investment in energy efficiency and combined heat and power projects with incentives of up to $4 million for eligible projects in the state's largest commercial and industrial facilities.

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State	Availability	Description
New Mexico	Statewide in the territories of three investor-owned utilities	Eligible customers must have electricity consumption greater than 7,000 MWh per year. Participants can receive credit for up to 70% of the annual energy efficiency rider. Self-direct customers provide their own engineering analysis and must meet the same total resource cost test as all the other industrial and commercial offerings. The customer must demonstrate to the reasonable satisfaction of the utility that its expenditures are cost effective. Eligible expenditures must have a simple payback period of more than one year but less than seven years.
New York	Statewide (all six electric utilities)	In an order issued February 26, 2015 (REV Order), the commission required staff to work with the utilities and large industrial customers to develop Self-Direct Program Guidelines to be filed by August 3, 2015. The order also required electric utilities to implement a self-direct program in accordance with the Self-Direct Program Guidelines no later than January 1, 2017. The Self-Direct Program is available to all individual customers with a 36-month average demand of 2 MW or greater. It is also available to customers with an aggregated 36-month average demand of 4 MW or greater, as long as one or more of the accounts being aggregated by the customer has at least a 36-month average demand of 1 MW. To be eligible to participate in the upcoming three-year cycle, current participants in the Self-Direct Program must have accessed 100% of any funds rolled over from the previous cycle, at least 45% of the funds from their ESA by September 30 of the third year of the current cycle, and have achieved savings at or below the dollar per MWh to which the participant committed at the time of enrollment. The initial three-year cycle for the Self-Direct programs ran from 2017 through 2019. Enrollment in the Self-Direct programs was generally minimal and, therefore, in a March 2018 order, the commission allowed each utility to determine whether to continue to offer its large energy-user customers a self-direct program.

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State	Availability	Description
Oregon	Customers of Portland General Electric, PacifiCorp, and select customers of Emerald People's Utility District	Senate Bill 1149 directed Oregon's two largest utilities, Portland General Electric and Pacific Power, to collect a public purpose charge from their customers to fund energy conservation and renewable projects in the state. However, large electric consumer sites that used more than 8,760,000 kWh in the prior year may be eligible for the Large Electric Consumer Public Purpose Program, also known as the Self-Direct Program, which allows them to self-direct the conservation and renewable portions of their public purpose charge rather than pay the utility directly. The Oregon Department of Energy (ODOE) reviews applications and approves sites that meet eligibility criteria to become self-direct consumers. Sites then spend their own funds to build pre-certified projects. Once the project is complete, they submit an application for credit to ODOE. ODOE reviews and approves the eligible project costs, which include a small fee paid to ODOE for program administration. Certified project costs are then added to the conservation or renewable credit balance, and the credits do not expire. Each month when a site has a conservation and renewable credit balance, they can offset the monthly conservation and renewable portion of the public purpose charge, meaning they do not pay the utility that portion of the PPC. The available credit balance is reduced by the monthly conservation and renewable offset amount. Two former Pacific Power sites in Emerald People's Utility District (EPUD—a COU utility—territory participates in a self-direction program, but no COUs including EPUD are subject to public purpose charge requirements. Portland General Electric and Pacific Power cover approximately 80% of the electric customers in Oregon. Participants in the three participating programs have their proposed projects technically reviewed by the Oregon Department of Energy. This includes a technical review of claimed savings. A sampling of projects is reviewed for actual performance. Eighty sites, or roughly one-third of eligible sites, currently self-direct energy efficiency funds, accounting for about one-third of eligible load. Total savings for 2019 was 1,634,309 kWh.

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State	Availability	Description
Vermont	Statewide for electric and natural gas customers	For electric energy efficiency, there are three self-direct options available statewide: Self-Managed Energy Efficiency Program (SMEEP), Customer Credit Program (CCP), and Energy Savings Accounts (ESA). SMEEP is also available for the two eligible gas customers. The SMEEP options require prospective participants or their successors to have contributed $1.5 million to the Energy Efficiency Fund in 2008 or 2017 through the Efficiency Charge added on their electric bills to meet the requirements. Currently there are two customers in the program. Additionally, an eligible customer must commit to investing a minimum of $3 million over a three-year program cycle. For SMEEP electric, an eligible customer must demonstrate that it has a comprehensive energy management program with annual objectives or demonstrate that it has achieved certification of ISO standard 14001. They then provide a report to the PUC detailing the measures undertaken, estimated savings and related costs. These reports are then reviewed and approved by the PUC. In addition, the Vermont PUC has established an option for eligible Vermont business customers to self-administer energy efficiency through the use of an Energy Savings Account (ESA) or the Customer Credit Program. These funds are still paid into the VEEUF and disbursed to the participants upon completion of an eligible energy efficiency measure. The ESA option allows Vermont businesses that pay an Energy Efficiency Charge (EEC) in excess of $5,000 total per year (or an average $5,000 total per year over three years) to use a portion of their EEC to support energy efficiency projects in their facilities. The ESA is run through the Efficiency Vermont program and related savings are reported and verified through the Savings Verification mechanism. For CCP, eligible customers must be ISO 14001-certified and meet several conditions similar to Energy Star for industrial facilities. For natural gas energy efficiency, eligible only for transmission and industrial electric and natural gas ratepayers. A pilot program has been developed to allow customers selected through a competitive process to be able to self-direct a large portion of the funds collected through the electric EEC paid by that customer to both electric and thermal energy efficiency projects. This pilot is capped at $2 million annually.
Washington	All utilities may develop self-direct options for industrial and commercial customers, but of the IOUs, only Puget Sound Energy has developed a self-direct program	Puget Sound Energy's self-direct program is available only to industrial or commercial customers on electric rate-specific rate schedules. The self-direct program operates on a four-year cycle comprising two phases: noncompetitive and competitive. During the noncompetitive phase, customers have exclusive access to their energy efficiency funds, which are collected over the four-year period. When this phase ends, any unused funds are pooled together and competitively bid on by the members of the self-direct program. Customers receive payment in the form of a check once their project is complete and verified. Participating customers do not receive any rate relief when they complete energy efficiency investments. The utility pre- and post-verifies 100% of the projects, including a review and revision of savings calculations to determine incentive levels. The program is included in the third-party evaluation cycle like any other utility conservation program.

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State	Availability	Description
Wisconsin	Statewide	A self-direct option is open to customers that meet the definition of a large energy customer according to the 2005 Wisconsin Act 141. Under the self-direct option, a true-up at the end of the year returns contributions to participating customers for use on energy efficiency projects. Evaluation is required under Public Service Commission Administrative Code 137, with evaluation plans reviewed by that commission. This option has been available since 2008, but no customers have participated to date.

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Appendix D. State Energy Efficiency Resource Standards

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Arizona 2010 Regulatory Electric and nat. gas IOUs, co-ops (~56%)	Electric: Incremental savings targets began at 1.25% of sales in 2011, ramping up to 2.5% in 2016–20 for cumulative annual electricity savings of 22% of retail sales, 2% of which may come from peak demand reductions. Natural gas: ~0.6% annual savings (for cumulative savings of 6% by 2020). Co-ops must meet 75% of targets.	2.1% (standard terminates in 2020)	Binding	Docket No. RE-00000C-09-0427, Decision 71436 Docket No. RE-00000C-09-0427, Decision 71819 Docket No. RG-00000B-09-0428, Decision 71855	2.5
Arkansas 2018 Regulatory Electric and nat. gas IOUs (~50%)	Electric: Incremental targets for PY 2020–22 of 1.2% of 2018 retail sales for electric IOUs. Natural gas: Annual incremental reduction target of 0.50% for 2020–22 for natural gas IOUs.	1.2% (net)	Opt-out	Order No. 17, Docket No. 08-144-U Order No. 1, Docket No. 13-002-U Order No. 7, Docket No. 13-002-U Order No. 31, Docket No. 13-002-U Order No. 43, Docket No.13-002-U	1.5
California 2004, 2009, and 2015 Legislative Electric and nat. gas IOUs (~73%)	While SB 350, signed in 2015, called on state agencies and utilities to double cumulative efficiency savings achieved by 2030, work to develop specific utility targets is ongoing. Electric: Average incremental savings targets of about 1.3% of retail electricity sales from 2020–25. Natural gas: Incremental savings targets average 0.5% from incentive and codes and standards programs for natural gas from 2020–25. Utilities must pursue all cost-effective efficiency resources.	1.6% (gross) 1.3% (net)	Binding	CPUC Decision 15-10-028 CPUC Decision 17-09-025 CPUC Decision 19-08-034 AB 995 SB 350 (10/7/15) AB 802 (10/8/15)	1.5

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Colorado 2007 and 2017 Legislative Electric and nat. gas IOUs (~56%)	Electric: For 2015–18, PSCo was required to achieve incremental savings of at least 400 GWh per year; starting in 2019, this was increased to 500 GWh, or roughly 1.7% of sales. HB 17-1227 extends programs and calls for 5% energy savings by 2028 compared with 2018. Natural gas: Savings targets commensurate with spending targets (at least 0.5% of prior year's revenue).	1.7%	Binding	Colorado Revised Statutes 40-3.2-101, et seq.; Docket No. 13A-0686EG Dec. C14-0731 HB17-1227 Proceeding no. 17A-04262EG: Settlement Agreement (2/26/18) Dec. C18-0417 approving settlement agreement in proceeding 17A-0462EG	2.0
Connecticut 2007 and 2013 Legislative Electric and nat. gas IOUs (~93%)	Electric: Average incremental savings of 1.11% of sales from 2019 through 2021. Natural gas: Average incremental savings of 0.59% per year from 2019 through 2021. Utilities must pursue all cost-effective efficiency resources.	1.1%	Binding	Public Act No. 07-242 Public Act No. 13-298 2019–21 Electric and Natural Gas Conservation and Load Management Plan	1.5
Hawaii 2004 and 2009 Legislative Electric Statewide goal (100%)	In 2009, transitioned away from a combined RPS-EERS to a stand-alone Energy Efficiency Portfolio Standard (EEPS) goal to reduce electricity consumption by 4,300 GWh by 2030 (equal to ~30% of forecast electricity sales, or 1.4% annual savings).	1.4%	Binding	HRS §269-91, 92, 96 HI PUC Order, Docket No. 2010-0037	1.0
Illinois 2007 and 2016 Legislative Electric and nat. gas utilities with more than 100,000 customers, Illinois DCEO (~89%)	Electric: Incremental savings targets vary by utility, averaging 1.77% of sales from 2018 to 2021, 2.08% from 2022 to 2025, and 2.05% from 2026 to 2030. SB 2814 also sets a rate cap of 4%, allowing targets to be adjusted downward should utilities reach spending limits. Natural gas: 8.5% cumulative savings by 2020 (0.2% incremental savings in 2011, ramping up to 1.5% in 2019).	2.0%	Cost cap	S.B. 1918 (2009) Public Act 96-0033 § 220 ILCS 5/8-103 S.B. 2814 (2015) Public Act 99-0906 Illinois Energy Efficiency Stakeholder Advisory Group	2.5

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Iowa 2009 and 2018 Legislative Electric and nat. gas IOUs (75%)	Requirements for utility submission of energy efficiency goals to the Iowa Utilities Board (IUB) are outlined in Iowa Code § 476.6(13). Incremental savings targets vary by utility and have been reduced significantly by a 2% cost cap for electric energy efficiency under Iowa Code § 476.6(15)(c)(2) (1.5% cap for natural gas). Current gross savings targets average 0.9% of electric sales and 0.2% for natural gas according to five-year utility plans (2019–23). Iowa Code § 476.6(13) requires municipal utilities and rural cooperatives to offer energy efficiency savings programs, but their plans are not reviewed or approved by the IUB.	0.9%	Binding	Senate Bill 2386 Docket EEP-2012-0001 SF 2311 (2018) Iowa Code chapter 1135, § 476.6	1.0
Maine 2009 Legislative Electric and nat. gas Efficiency Maine (100%)	Electric: Incremental gross savings targets of ~1.25% per year for 2020–2022 or roughly 1% net savings. Natural gas: Incremental savings of ~0.1% per year for 2020–2022. Efficiency Maine operates under an all cost-effective mandate.	1.25% (gross) 1.0% (net)	Opt-out	Efficiency Maine Triennial Plan (2014–16) Efficiency Maine Triennial Plan (2017–19) Efficiency Maine Triennial Plan (2020–22) HP 1128 – LD 1559	2.5
Maryland 2008 and 2015 Legislative Electric IOUs (97%)	Electricity use reduction goal of 15% per capita by 2015 (10% by utilities, 5% achieved independently); 15% reduction in per capita peak demand by 2015 compared with 2007. After 2015, targets vary by utility, ramping up by 0.2% per year to reach 2% incremental savings.	2.0% (gross) 1.6% (net)	Binding	Maryland Public Utility Companies Code § 7-211 Maryland PSC Docket Nos. 9153–9157 Order No. 87082	1.5

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Massachusetts 2009 Legislative Electric and nat. gas IOUs, co-ops, munis, Cape Light Compact (85%)	Electric: Net annual savings of 3.45 million MWh (not including fuel switching) for 2019–21, equivalent to savings of about 2.7% of retail sales per year. Natural gas: Savings goals of 1.25% of retail sales. Net annual savings of 95.89 MMTherms for 2019–21. Additional goal of 261.9 million net lifetime MMBtu for 2019–21. All cost-effective efficiency requirement.	2.7%	Binding	M.G.L. ch. 25, § 21; D.P.U. 18-110 through D.P.U. 18-119 (MA Joint Statewide Three-Year Energy Efficiency Plan for 2019 through 2021.)	3.0
Michigan 2008 and 2016 Legislative Electric and nat. gas Statewide goal (100%)	Electric: 1.0% incremental savings. Natural gas: Incremental savings of 0.75%. Targets carry forward in perpetuity for most utilities but end in 2021 for non-rate-regulated utilities (approximately 10% of state electric load).	1.0%	Binding	Act 295 (2008) S.B. 438 (2016)	1.5
Minnesota 2007 Legislative Electric and nat. gas IOUs, co-ops with more than 5,000 customers, and munis with more than 1,000 customers (~97%)	Electric: 1.5% incremental savings in 2010 and each year thereafter. Senate File 1456 signed in May 2017 exempts some rural utilities from meeting energy efficiency requirements through the Conservation Improvement Program (CIP). Natural gas: 0.75% incremental savings per year in 2010–12; 1% incremental savings in 2013 and each year thereafter.	1.5% (net) 1.2% (gross)	Binding	Minn. Stat. § 216B.241 SF 1456	1.5

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Nevada 2005 and 2009 Legislative Electric IOUs (88%)	20% of retail electricity sales to be met by renewables and energy efficiency by 2015, and 25% by 2025. Energy efficiency may meet a quarter of the standard through 2014 but is phased out of the RPS by 2025. SB 150, signed June 2017, directed the Nevada Public Utilities Commission to set new savings goals for NV Energy. The utility's 2018 Joint IRP Demand Side Plan established statewide goals of 1.18% in 2019, 1.14% in 2020, and 1.14% in 2021.	1.1%	Binding	NRS 704.7801 et seq.; Docket: 17-08023 – Investigation and rulemaking to implement Senate Bill 150 (2017) Docket No. 18-06003	1
New Hampshire 2016 Regulatory Electric and nat. gas Statewide goal (100%)	Electric: 0.8% incremental savings in 2018, ramping up to 1% in 2019 and 1.3% in 2020. Natural gas: 0.7% in 2018, 0.75% in 2019, and 0.8% in 2020.	1.3%	Binding	NH PUC Order No. 25932, Docket DE 15-137	1.5
New Jersey 2018 Legislative Electric and nat. gas Statewide goal (100%)	Electric: Under 2018 legislation A3723/S2314, utilities must achieve 2% of electric savings (as a percentage of average annual usage from the prior three years) within five years. Natural gas: Must achieve 0.75% of natural gas usage (as a percentage of average annual usage from the prior three years) within five years.	1.6%	Binding	A3723/S2314 (2018)	2
New Mexico 2008 and 2013 Legislative Electric IOUs (69%)	The state's three public utilities must achieve 5% savings of 2020 retail sales by 2025. HB 291 (2019) directs the Public Regulation Commission to set additional targets through 2030.	1.0%	Binding	NM Stat. § 62-17-1 et seq. HB 291	1

State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
New York 2008, 2016, 2018, and 2020 Regulatory Electric and nat. gas Statewide goal (100%)	An April 2018 NYSERDA white paper called for 185 TBtus of cumulative annual site energy savings under the 2025 energy use forecast, as well as an electric site savings sub-target of 3% of IOU sales in 2025. A December 2018 PSC Order adopting the 3% electric goal calls for utilities to propose detailed targets. Natural gas goals ramp up to 1.3% by 2025. In January 2020, the PSC authorized annual incremental utility-specific budgets and savings targets for electric, gas, and heat pump portfolios.	2.0%	Binding	NY PSC Order Authorizing the Clean Energy Fund Framework Energy Efficiency Metrics and Target Options Report (November 2016) New Efficiency: New York (2018) NY PSC Case 18-M-0084	2.5
North Carolina 2007 Legislative Electric Statewide goal (100%)	Renewable Energy and Energy Efficiency Portfolio Standard (REPS) requires renewable generation and/or energy savings of 6% by 2015, 10% by 2018, and 12.5% by 2021 and thereafter. Energy efficiency is capped at 25% of target, increasing to 40% in 2021 and thereafter. REPS for electric cooperatives and munis requires renewable generation and/or energy savings of 3% by 2012, 6% by 2014, and 10% by 2018.	Combined RPS/EERS	Opt-out	NC Gen. Stat. § 62-133.8 04 NCAC 11 R08-64, et seq.	0
Oregon 2010 Regulatory Electric and nat. gas Energy Trust of Oregon (~61%)	Electric: Incremental targets average ~1.3% of sales annually for the period 2020–2021. Natural gas: ~0.5% of sales annually for 2020–2021	1.3% (gross) 1.2% (net)	Binding	Energy Trust of Oregon 2020 Annual Budget and 2020–2021 Action Plan Grant Agreement between Energy Trust of Oregon and OR PUC	1.5
Pennsylvania 2004 and 2008 Legislative Electric Utilities with more than 100,000 customers (96%)	Varying targets have been set for IOUs amounting to yearly statewide incremental savings of 0.6% for 2021–2026. EERS includes peak demand targets. Energy efficiency measures may not exceed an established cost cap.	0.6%	Cost cap	66 Pa. C.S. § 2806.1 Act 129 Phase IV Program Implementation Order (6/18/2020): Docket No. M-2020-3015228.	0.5

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Rhode Island 2006 Legislative Electric and nat. gas IOUs, munis (~99%)	Electric: Average incremental savings of 2.5% for 2018–20. EERS includes demand response targets. Natural gas: Incremental savings of 0.97% for 2018–20. Utilities must acquire all cost-effective energy efficiency.	2.5%	Binding	RIGL § 39-1-27.7 Docket No. 4443 National Grid's 2018–20 Energy Efficiency and System Reliability Procurement Plan	3.0
Texas 1999 and 2007 Legislative Electric IOUs (74%)	20% incremental load growth in 2011 (equivalent to ~0.10% annual savings); 25% in 2012, and 30% in 2013 and onward. Peak demand reduction targets of 0.4% compared with previous year. Energy efficiency measures may not exceed an established cost cap.	0.2%	Cost cap, opt-out	SB 7 HB 3693 Substantive Rule § 25.181 SB 1125	0
Vermont 2000 Legislative Electric Efficiency Vermont, Burlington Electric (98%)	Electric: Annual incremental savings totaling 357,400 MWh over 2018–20, or approximately 2.4% of annual sales. EERS includes demand response targets. Natural gas: Three-year annual incremental savings of 192,599 Mcf spanning 2018–20 or 0.5% of sales. Energy efficiency utilities must set budgets at a level that would realize all cost-effective energy efficiency.	2.4%	Binding	30 V.S.A. § 209; Efficiency Vermont Triennial Plan 2018–20 Order Re: Quantifiable Performance Indicator Targets for Vermont Gas Systems (12/23/15) EEU-2016-03: PUC Order on 10/12/17 re: Performance Targets	2.5
Virginia 2020 Legislative Electric IOUs (87%)	The 2020 Virginia Clean Economy Act requires Dominion Energy to achieve 5% energy savings by 2025 relative to a 2019 baseline. ApCo must achieve 2% by 2025, relative to a 2019 baseline. Statewide these goals translate to average incremental annual savings of approximately 1.2% over four years.	1.2%	Binding	Virginia Clean Economy Act	1.0

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State Year(s) enacted Authority Applicability (% sales affected)	Description	Average incremental electric savings target per year (2020–2025)	Stringency	Reference	Score
Washington 2006 Legislative Electric IOUs, co-ops, munis (83%)	Biennial and 10-year goals vary by utility. Law requires savings targets to be based on the Northwest Power Plan, which targets acquiring 1,400 average MW by 2021, 3,000 aMW by 2026, and 4,300 aMW by 2035. Electric: Targets average ~0.94% incremental electricity savings per year. Natural gas: HB 1257 (2019) establishes a natural gas conservation standard requiring each gas company to acquire all conservation measures that are available and cost effective. Each company must set an acquisition target every two years, with initial targets taking effect by 2022. All cost-effective conservation requirement.	0.9%	Binding	Ballot Initiative I-937 Energy Independence Act, ch. 19.285.040 WAC 480-109-100 WAC 194-37 Seventh Northwest Power Plan (adopted 2/10/16) Washington Department of Commerce 2019 Biennial Report	1.0
Wisconsin 2011 Legislative Electric and nat. gas Statewide goal (100%)	Four-year goal for 2019–22 of 224,666,366 total net life-cycle MMBtus (combined electric and natural gas). Energy efficiency measures may not exceed an established cost cap. Electric: Minimum electric net life-cycle savings target of 22,832 GWh for 2019–22 or 1,840 GWh first-year savings across 2019–22. This translates to roughly 0.6–0.7% of sales per year in 2019–22. Natural gas: Focus on Energy targets minimum net life-cycle natural gas savings goal of 1,243 MMTherms for measures implemented in 2019–22, or 95.9 MMTherms of first-year savings, equating to approximately 0.6% savings as a percentage of sales on a net basis.	0.7%	Cost cap	2005 Wisconsin Act 141 Order, Docket 5-FE-100: Focus on Energy Revised Goals and Renewable Loan Fund (10/15) PSCW Memorandum, Docket 5-FE-101 (5/18) PSCW Decision, Docket 5-FE-101 (6/18)	1.0

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Appendix E: State Electric Vehicle (EV) Fees

State	EV fee	Average gasoline tax collected for gasoline vehicles	Ratio of EV fee to gas tax revenues
Alabama	$200	$80.03	2.50
Alaska	-	$27.81	-
Arizona	-	$75.09	-
Arkansas	$200	$87.16	2.29
California	$100	$181.33	0.55
Colorado	$50	$89.30	0.56
Connecticut	-	$103.95	-
Delaware	-	$113.50	-
District of Columbia	-	$101.99	-
Florida	-	$79.03	-
Georgia	$213	$124.17	1.71
Hawaii	$50	$72.70	0.69
Idaho	$140	$132.31	1.06
Illinois	$100	$81.25	1.23
Indiana	$150	$122.98	1.22
Iowa	$65	$133.20	0.49
Kansas	$100	$99.29	1.01
Kentucky	-	$122.77	-
Louisiana	-	$92.08	-
Maine	-	$136.76	-
Maryland	-	$154.75	-
Massachusetts	-	$105.05	-
Michigan	$100	$122.75	0.81
Minnesota	$75	$137.04	0.55
Mississippi	$150	$83.57	1.79
Missouri	$75	$74.50	1.01
Montana	-	$113.00	-
Nebraska	$75	$137.91	0.54
Nevada	-	$103.83	-
New Hampshire	-	$110.18	-
New Jersey	-	$166.78	-

State	EV fee	Average gasoline tax collected for gasoline vehicles	Ratio of EV fee to gas tax revenues
New Mexico	-	$71.77	-
New York	-	$106.44	-
North Carolina	$130	$159.46	0.82
North Dakota	$120	$96.54	1.24
Ohio	$200	$124.03	1.61
Oklahoma	-	$85.44	-
Oregon	$110	$115.59	0.95
Pennsylvania	-	$249.58	-
Rhode Island	-	$152.38	-
South Carolina	$60	$81.60	0.74
South Dakota	-	$125.11	-
Tennessee	$100	$111.02	0.90
Texas	-	$96.13	-
Utah	$90	$111.64	0.81
Vermont	-	$134.98	-
Virginia	$64	$70.75	0.90
Washington	$150	$190.66	0.79
West Virginia	$200	$169.78	1.18
Wisconsin	$100	$142.37	0.70
Wyoming	$200	$101.06	1.98

Source: Atlas Public Policy 2020

Appendix F: Public EV Charging Stations

State	Number of public EV charging stations	2019 population	Stations per 100,000 people
Vermont	217	623,989	34.78
District of Columbia	147	705,749	20.83
Hawaii	273	1,415,872	19.28
California	6,177	39,512,223	15.63
Colorado	899	5,758,736	15.61
Oregon	606	4,217,737	14.37
Washington	1,008	7,614,893	13.24
Massachusetts	860	6,892,503	12.48
Rhode Island	129	1,059,361	12.18
Maryland	709	6,045,680	11.73
Maine	154	1,344,212	11.46
Utah	361	3,205,958	11.26
Connecticut	340	3,565,287	9.54
New York	1,605	19,453,561	8.25
Georgia	847	10,617,423	7.98
Virginia	610	8,535,519	7.15
New Hampshire	94	1,359,711	6.91
Kansas	200	2,913,314	6.87
Nevada	208	3,080,156	6.75
Missouri	410	6,137,428	6.68
Florida	1,346	21,477,737	6.27
Wyoming	36	578,759	6.22
North Carolina	642	10,488,084	6.12
Arizona	444	7,278,717	6.10
Tennessee	400	6,829,174	5.86
Minnesota	321	5,639,632	5.69
Delaware	53	973,764	5.44
Oklahoma	212	3,956,971	5.36
Illinois	612	12,671,821	4.83
Pennsylvania	592	12,801,989	4.62
Nebraska	89	1,934,408	4.60
Iowa	138	3,155,070	4.37

State	Number of public EV charging stations	2019 population	Stations per 100,000 people
Ohio	511	11,689,100	4.37
South Carolina	223	5,148,714	4.33
New Jersey	376	8,882,190	4.23
Texas	1,227	28,995,881	4.23
Michigan	411	9,986,857	4.12
Wisconsin	222	5,822,434	3.81
North Dakota	29	762,062	3.81
New Mexico	77	2,096,829	3.67
Idaho	63	1,787,065	3.53
Montana	37	1,068,778	3.46
West Virginia	61	1,792,147	3.40
Kentucky	138	4,467,673	3.09
South Dakota	27	884,659	3.05
Alaska	22	731,545	3.01
Indiana	190	6,732,219	2.82
Arkansas	84	3,017,804	2.78
Alabama	135	4,903,185	2.75
Mississippi	69	2,976,149	2.32
Louisiana	94	4,648,794	2.02

Appendix G. Tax Incentives for High-Efficiency Vehicles

State	Tax incentive
Arizona	Electric vehicle (EV) owners in Arizona pay a significantly reduced vehicle license tax—$4 for every $100 in assessed value—as part of the state's Reduced Alternative Fuel Vehicle License Tax program.
California	AB 118 targets medium- and heavy-duty trucks in a voucher program that aims to reduce the up-front incremental cost of purchasing a hybrid vehicle. Vouchers for up to $117,000 are available, depending on vehicle specifications, and are issued directly to fleets that purchase hybrid trucks for use within the state. California also offers rebates of up to $5,000 for light-duty zero-emission EVs and plug-in hybrid EVs on a first-come, first-served basis.
Colorado	In 2019 the Colorado legislature approved HB 1159, a bill that extends the state's alternative fuel vehicle tax credits through 2025. It sets a flat $5,000 credit, through 2019, for the purchase of a light-duty electric vehicle and makes the credit assignable to a car dealer or finance company, effectively turning the credit into a point-of-sale incentive. The tax credit declines to $4,000 for vehicles purchased in 2020, $2,500 for vehicles purchased in 2021 and 2022, and $2,000 for vehicles purchased in 2023–2025. Higher incentives are available for light-, medium-, and heavy-duty trucks.
Connecticut	Connecticut's Hydrogen and Electric Automobile Purchase Rebate Program provides as much as $3,000 for the incremental cost of the purchase of a hydrogen fuel cell electric vehicle, an all-electric vehicle, or a plug-in hybrid EV. Rebates are calculated on the basis of battery capacity. Vehicles with a battery capacity of 18 kWh or more earn $3,000, while those with capacities between 7 kWh and 18 kWh earn $1,500. Vehicles with batteries smaller than 7 kWh are eligible for a rebate of $750.
Delaware	As part of the Delaware Clean Transportation Incentive Program, the following rebates are available: • $3,500 for battery EVs under $60,000 MSRP • $1,500 for plug-in hybrid EVs and EVs with gasoline range extenders under $60,000 MSRP • $1,000 for battery and plug-in hybrid EVs over $60,000 MSRP
District of Columbia	The District of Columbia offers a reduced registration fee and a vehicle excise tax exemption for owners of all vehicles with an EPA-estimated city fuel economy of at least 40 miles per gallon.
Louisiana	Louisiana offers an income tax credit equivalent to 50% of the incremental cost of purchasing an EV under the state's alternative-fuel vehicle tax credit program. Alternatively, taxpayers may claim the lesser of 10% of the total cost of the vehicle or $3,000.
Maine	Maine is preparing to offer a $2,000 rebate for qualified electric vehicles, a $1,000 rebate for plug-in hybrids, and an enhanced rebate for low-income individuals, using monies from the Volkswagen Settlement Fund.
Massachusetts	The Massachusetts Offers Rebates for EVs (MOR-EV) program offers rebates of up to $2,500 to customers purchasing plug-in EVs.
New Jersey	All zero-emission vehicles in New Jersey are exempt from state sales and use taxes. In addition, vehicles that have an EPA fuel economy rating of less than 19 mpg or cost $45,000 or more in sales or lease price are subject to a fuel-inefficient vehicle fee.

State	Tax incentive
New York	Pursuant to legislation passed in April 2016, NYSERDA developed a rebate program for zero-emission vehicles that launched in March 2017. Rebates of up to $2,000 per vehicle are available for battery EVs, plug-in hybrid EVs, and fuel cell vehicles. New York also started the New York Truck Voucher Incentive Program, in 2014. Vouchers of up to $60,000 are available for the purchase of hybrid and all-electric class 3–8 trucks.
Oklahoma	Oklahoma offers income tax credits of up to $50,000 for the purchase of electric vehicles. Credit amounts are determined by the gross vehicle weight rating of the vehicle.
Oregon	The Oregon Clean Vehicle Rebate Program offers rebates of $1,500–2,500 toward the purchase of a new hybrid or battery electric vehicle, depending on battery capacity. Rebates of $2,500 are available to low- and moderate-income households for the purchase of new and used EVs. All eligible vehicles must have a base MSRP of less than $50,000.
Pennsylvania	The Alternative Fuels Incentive Grant Program offers rebates to assist eligible residents in purchasing new alternative fuel vehicles. Qualified electric vehicles earn a rebate of $1,750.
Texas	Electric vehicles weighing 8,500 pounds or less and purchased after September 1, 2013, are eligible for a $2,500 rebate.
Utah	Until December 2020, taxpayers are eligible for tax credits for the purchase of qualifying electric heavy-duty vehicles. Vehicles purchased in 2019 were eligible for an $18,000 tax credit. The tax credit amount has been gradually reduced from $25,000 in 2017 to $15,000 by 2020.
Virginia	The Virginia Department of Mines, Minerals and Energy, in collaboration with the Virginia Department of Transportation, offers up to $10,000 to state agencies and local governments for the incremental cost of new or converted alternative fuel vehicles.
Washington	Tax credits are available to businesses that purchase new alternative fuel commercial vehicles. Businesses may claim up to $250,000 or credits for 25 vehicles per year through January 1, 2021. HB 2042, passed in March 2019, also extends tax credits for light-duty passenger vehicles.

Source: DOE 2020a

Appendix H. State Transit Funding

State	FY 2018 funding	2018 population*	Per capita transit expenditure
Massachusetts	$2,105,381,276	6,882,635	$305.90
New York	$5,222,193,300	19,530,351	$267.39
Alaska	$181,178,229	735,139	$246.45
Connecticut	$651,477,883	3,571,520	$182.41
Illinois	$2,302,779,973	12,723,071	$180.99
Maryland	$1,032,129,469	6,035,802	$171.00
Pennsylvania	$1,689,999,183	12,800,922	$132.02
District of Columbia	$564,610,302	5,000,000	$112.92
Delaware	$102,177,731	965,479	$105.83
Minnesota	$493,700,000	5,606,249	$88.06
California	$2,635,079,270	39,461,588	$66.78
Rhode Island	$58,441,037	1,058,287	$55.22
Virginia	$454,232,979	8,501,286	$53.43
New Jersey	$389,474,344	8,886,025	$43.83
Michigan	$307,190,392	9,984,072	$30.77
Wisconsin	$113,487,500	5,807,406	$19.54
Florida	$375,809,491	21,244,317	$17.69
Washington	$106,996,000	7,523,869	$14.22
Vermont	$7,955,199	624,358	$12.74
Indiana	$65,288,653	6,695,497	$9.75
North Carolina	$93,943,490	10,381,615	$9.05
Tennessee	$56,040,141	6,771,631	$8.28
Oregon	$29,158,082	4,181,886	$6.97
Iowa	$15,932,516	3,148,618	$5.06
North Dakota	$3,831,141	758,080	$5.05
Kansas	$11,000,000	2,911,359	$3.78
Nebraska	$6,297,705	1,925,614	$3.27
Wyoming	$1,718,187	577,601	$2.97
New Mexico	$5,700,000	2,092,741	$2.72
Colorado	$15,000,000	5,691,287	$2.64
Arizona	$11,652,906	7,158,024	$1.63
Georgia	$16,000,744	10,511,131	$1.52
Oklahoma	$5,750,000	3,940,235	$1.46

West Virginia	$2,262,989	1,804,291	$1.25
Texas	$34,991,068	28,628,666	$1.22
South Carolina	$6,000,000	5,084,156	$1.18
Arkansas	$3,526,664	3,009,733	$1.17
Maine	$1,540,322	1,339,057	$1.15
South Dakota	$1,000,000	878,698	$1.14
Louisiana	$4,955,000	4,659,690	$1.06
New Hampshire	$1,353,603	1,353,465	$1.00
Montana	$825,000	1,060,665	$0.78
Ohio	$6,500,000	11,676,341	$0.56
Mississippi	$1,600,000	2,981,020	$0.54
Kentucky	$1,845,949	4,461,153	$0.41
Missouri	$1,710,875	6,121,623	$0.28
Idaho	$312,000	1,750,536	$0.18
Alabama	$0	4,887,681	$0.00
Hawaii	$0	1,420,593	$0.00
Nevada	$0	3,027,341	$0.00

* Population figures represent total area served by transit system. *Source:* AASHTO 2019.

Appendix I. State Transit Legislation

State	Description	Source
Alabama	Alabama Act 2018-161 requires the Alabama Department of Economic and Community Affairs to create, oversee, and administer the Alabama Public Transportation Trust Fund, establishing a path to increase public transportation options in the state.	legiscan.com/AL/bill/SB85/2018
Arkansas	Passed in 2001, Arkansas Act 949 established the Arkansas Public Transit Fund, which directs monies from rental vehicle taxes toward public transit expenditures.	www.arkleg.state.ar.us/assembly/2001/R/Acts/Act949.pdf
California	California's Transportation Development Act provides two sources of funding for public transit: the Location Transportation Fund (LTF) and the State Transit Assistance (STA) Fund. The general sales tax collected in each county is used to fund each county's LTF. STA funds are appropriated by the legislature to the state controller's office. The statute requires that 50% of STA funds be allocated according to population and 50% be allocated according to operator revenues from the prior fiscal year.	www.dot.ca.gov/hq/MassTrans/State-TDA.html
Colorado	In 2018 Colorado adopted SB1, which significantly expands state funding for transit. SB1 creates a new multimodal options fund dedicated to public transit and bicycle and pedestrian infrastructure and operations.	leg.colorado.gov/bills/sb18-001
Florida	House Bill 1271 allows municipalities in Florida with a regional transportation system to levy a tax, subject to voter approval, that can be used as a funding stream for transit development and maintenance.	www.myfloridahouse.gov/sections/Bills/billsdetail.aspx?BillId=44036
Georgia	The Transportation Investment Act, enacted in 2010, allows municipalities to pass a sales tax for the express purpose of financing transit development and expansion.	gsfic.georgia.gov/transportation-investment-act
Hawaii	Section HRS 46-16.8 of the Hawaii Revised Statutes allows municipalities to add a county surcharge to state tax; the surcharge is then funneled toward mass transit projects.	www.capitol.hawaii.gov/hrscurrent/Vol02_Ch0046-0115/HRS0046/HRS_0046-0016_0008.htm
Illinois	House Bill 289 allocates $2.5 billion for the creation and maintenance of mass transit facilities from the issuance of state bonds.	legiscan.com/gaits/text/70761

State	Description	Source
Indiana	House Bill 1011 specifies that a county or city council may elect to provide revenue to a public transportation corporation from the distributive share of county adjusted gross income taxes, county option income taxes, or county economic development income taxes. An additional county economic development income tax no higher than 0.3% may also be imposed to pay the county's contribution to the funding of the metropolitan transit district. Only six counties within the state may take advantage of this legislation.	legiscan.com/IN/text/HB1011/id/673339
Iowa	The Iowa State Transit Assistance Program devotes 4% of the fees for new registration collected on sales of motor vehicle and accessory equipment to support public transportation.	www.iowadot.gov/transit/funding.html
Kansas	Transportation Works for Kansas legislation, adopted in 2010, provides financing for a multimodal development program in communities with immediate transportation needs.	votesmart.org/bill/11412/30514/transportation-works-for-kansas-program%20%28T-Works%20for%20Kansas%20Program%29
Maine	The Maine Legislature created a dedicated revenue stream for multimodal transportation in 2012. The Multimodal Transportation Fund uses sales tax revenues derived from vehicle rentals. Funds must be used for purchasing, operating, maintaining, improving, repairing, constructing, and managing the assets of non-road forms of transportation.	www.mainelegislature.org/legis/statutes/23/title23sec4210-B.html
Maryland	In 2018 Maryland passed the Maryland Metro/Transit Funding Act. Maryland's Transportation Trust Fund must provide at least $167 million in revenues to the Washington Suburban Transit District through an annual grant that will be used to pay capital costs of the Washington Metropolitan Area Transit Authority. In addition, the legislation requires that at least $29.1 million of the revenue from the Transportation Trust Fund be provided for capital needs of the Maryland Transit Administration (MTA) in fiscal years 2020, 2021, and 2022. The legislation further requires that those appropriations for the MTA be increased by at least 4.4% over the previous year, starting with the fiscal year 2019 budget.	mgaleg.maryland.gov/2018RS/chapters_noln/Ch_352_hb0372E.pdf; see Transportation Article §3–216.and §7–205
Massachusetts	Section 35T of Massachusetts general law establishes the Massachusetts Bay Transportation Authority State and Local Contribution Fund. This account is funded by revenues from a 1% sales tax.	malegislature.gov/Laws/GeneralLaws/PartI/TitleII/Chapter10/Section35t
Michigan	The Michigan Comprehensive Transportation Fund funnels both vehicle registration revenues and auto-related sales tax revenues toward public transportation and targeted transit demand management programs.	www.legislature.mi.gov/(S(hlkm5k45i240utf2mb0odtzt))/mileg.aspx?page=getObject&objectName=mcl-247-660b

State	Description	Source
Minnesota	House File 2700, adopted in 2010, is an omnibus bonding and capital improvement bill that provides $43.5 million for transit maintenance and construction. The bill also prioritized bonding authorization so that appropriations for transit construction for fiscal years 2011 and 2012 would amount to $200 million.	wdoc.house.leg.state.mn.us/leg/LS86/CEH2700.1.pdf
New York	In 2010 New York adopted Assembly Bill 8180, which increased certain registration and renewal fees to fund public transit. It also created the Metropolitan Transit Authority financial assistance fund to support subway, bus, and rail.	www.ncsl.org/issues-research/transport/major-state-transportation-legislation-2010.aspx#N
North Carolina	In 2009 North Carolina passed House Bill 148, which called for the establishment of a congestion relief and intermodal transportation fund.	www.ncleg.net/sessions/2009/bills/house/pdf/h148v2.pdf
Oregon	Oregon has a Lieu of State Payroll Tax Program that provides a direct, ongoing revenue stream for transit districts that can demonstrate equal local matching revenues from state agency employers in their service areas.	www.oregonlegislature.gov/citizen_engagement/Reports/2008PublicTransit.pdf
Pennsylvania	Act 44 of House Bill 1590, passed in 2007, allows counties to impose a sales tax on liquor or an excise tax on rental vehicles to fund the development of county transit systems.	www.legis.state.pa.us/WU01/LI/LI/US/HTM/2007/0/0044..HTM
Tennessee	Senate Bill 1471, passed in 2009, calls for the creation of a regional transportation authority in major municipalities. It allows these authorities to set up dedicated funding streams for mass transit either by law or through voter referendum.	state.tn.us/sos/acts/106/pub/pc0362.pdf
Utah	Utah's comprehensive transportation funding bill, passed in 2015, allows counties to implement a 0.25% local sales tax to fund locally identified transportation needs. Of all revenues collected using this mechanism, 40% must be awarded to the county transit agency.	le.utah.gov/~2015/bills/static/HB0362.html
Virginia	House Bill 2313, adopted in 2013, created the Commonwealth Mass Transit Fund, which receives approximately 15% of revenues collected from the implementation of a 1.5% sales and use tax for transportation expenditures.	lis.virginia.gov/cgi-bin/legp604.exe?131+ful+CHAP0766
Washington	In 2015 SB 5987, the Connecting Washington Package, was passed, allocating $16 billion toward transportation connectivity, maintenance, and development projects.	apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/2660.SL.pdf
West Virginia	In 2013 the West Virginia Commuter Rail Access Act (Senate Bill 03) established a special fund in the state treasury to pay track access fees accrued by commuter rail services operating within the state's borders. The funds can be rolled over from year to year and are administered by the West Virginia State Rail Authority.	www.legis.state.wv.us/Bill_Status/bills_text.cfm?billdoc=SB103%20SUB1%20ENR.htm&yr=2013&sesstype=RS&i=103

Appendix J. State Progress toward Public Building Energy Benchmarking

State	Percentage benchmarked/Progress status
California	100% of state-owned, executive branch facilities, benchmarked since 2013
Connecticut	42% of state buildings, 100% of the Connecticut Technical High School system, 100% of several K–12 school districts, 100% of Connecticut Community Colleges
Delaware	80%
District of Columbia	Nearly 99% of government-owned floor area
Florida	20% of state-owned or leased facilities with more than 5,000 square feet of air-conditioned space
Hawaii	More than 29 million square feet of public facilities
Iowa	80,2 million square feet benchmarked; 1,572 sites and 2,148 buildings benchmarked in the Iowa B3 Benchmarking Program
Kentucky	801 buildings, representing more than 16 million square feet of facilities
Maryland	100% of state facilities
Massachusetts	100% of about 80 million square feet of state-owned facilities
Michigan	88% of state-owned facilities
Minnesota	More than 7,500 public buildings with more than 300 million square feet, representing 22 state agencies, 410 cities, 55 counties, 60 higher-education campuses, and 214 school districts
Mississippi	95% of agencies covered by the energy and cost data reporting requirements under the Mississippi Energy Sustainability and Development Act of 2013
Missouri	Approximately 50% of square footage managed by the Office of Administration and the Department of Corrections
Montana	63.6%
Nevada	86% of total state building square footage
New Hampshire	95% of state-owned building square footage
New Mexico	Approximately 20%
North Carolina	100% of state-owned buildings and community college buildings
Oregon	100% of state-owned and occupied buildings greater than 5,000 square feet
Rhode Island	100% of all state, municipal, and public-school square footage
South Carolina	100% of state-owned buildings
Tennessee	100% of state-owned and -managed facilities
Utah	75% of buildings managed by the Division of Facilities Construction and Management
Vermont	70% of the state-owned and -operated building space that the ENERGY STAR® Portfolio Manager is capable of benchmarking
Washington	55% of state agency square footage, 30% of college square footage, 17% of university square footage

Not all states with benchmarking requirements provided the percentage of buildings benchmarked. All states listed above, except Missouri, require benchmarking in public facilities. Missouri has a voluntary program.

Appendix K. State Energy Savings Performance Contracting: Investments and Savings

State	2019 investments ($ million)	2019 incremental electricity savings for all active ESCO projects	2019 annual savings from active projects
California	$14	6 million kWh	57 million kWh
Colorado	$28.7	23,203,131 kWh	
Maryland		$3,206,939 in savings once commissioning occurs	1,209,328 MMBtus
Massachusetts	$20.8		
Montana	$7.2	3,066,183 kWh	3,340,534 kWh (2017, 2018, and 2019)
New Mexico	$12.4	39,638,521 kWh	115,472,641 kWh
North Carolina	$22.9		$2,000,451 in guaranteed savings
Pennsylvania	$5.8	3,218,886 kWh	5,145,593 kWh
Utah	$4.6		3,830,885 kWh (expected)
Virginia	$53.5	1,100,000 kWh	18,200,000 kWh
Washington	$38.9	10,307,113 kWh	477,383,938 kWh

We excluded ESPC program budgets and projected energy and cost savings from states in order to focus on investments and cost and energy savings already achieved. This table includes only data that were provided by states in response to our data request.

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Appendix L. Total Energy and Cost Savings from State Financial Incentives

State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
Alabama	AlabamaSAVES Revolving Loan Program	State Energy Office	1,000,000 kWh (construction on project in 2020)	$50,000 (construction on project in 2020)	
Alabama	Energy Efficient Retrofit Program	State Energy Office	694,000 kWh (FY 19 annual savings)	$100,502 (FY 19 annual savings)	491 metric tons
California	Energy Conservation Assistance Act	California Energy Commission		$1,053,808 (CY 2019)	
California	Energy Conservation Assistance Act—Education Subaccount	California Energy Commission		$1,628,677 (CY 2019)	
California	Property Assessed Clean Energy (PACE) Loss Reserve Program	California Alternative Energy and Advanced Transportation Financing Authority	1.1 billion kWh per year (estimated, based on PACE financings enrolled as of October 2019)		
Colorado	Agricultural Energy Efficiency Program	Colorado Energy Office	2.6 million kWh (estimated) to date		
Colorado	Energy Savings for Schools	Colorado Energy Office	3.5 million kWh (estimated) to date		
Colorado	C-PACE: Colorado Commercial Property Assessed Clean Energy	Sustainable Real Estate Solutions	54.5 million kBtus annually (projected)	$29.5 million (projected) to date	
Delaware	Energy Efficiency Investment Fund Rebates	Department of Natural Resources and Environmental Control	12,505,366 (2019 net savings)		7,479.55 tons
Delaware	Energize Delaware Farm Program	Sustainable Energy Utility	747,094 (2019 net savings)		853.2 tons
Delaware	State Revolving Loan Fund	Department of Natural Resources and Environmental Control	343,103 (2019 net savings)		278.85 tons

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State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
Iowa	Energy Bank Revolving Loan Program	Iowa Area Development Group	127,593 kWh (2019)	$10,207 (2019)	97 tons (2019)
Maine	Efficiency Maine Consumer Products Program	Efficiency Maine Trust	67,811.3 MMBtus (FY 2019)	$777,061	
Maine	Efficiency Maine Home Energy Savings Program	Efficiency Maine Trust	1,327,410 MMBtus (FY 2019)	$11,187,676	
Maine	Efficiency Maine Low-Income Initiatives	Efficiency Maine Trust	485,606 MMBtus (FY 2019)	$6,289,344	
Maine	Efficiency Maine C&I Prescriptive Program	Efficiency Maine Trust	946,449 MMBtus (FY 2019)	$9,165,825	
Maine	Efficiency Maine C&I Custom Program	Efficiency Maine Trust	1,780,153 MMBtus (FY 2019)	$9,354,773	
Maryland	Be SMART Home Efficiency Loan Program	Maryland Department of Housing and Community Development	Anticipated energy savings of 126,551 kWh/year (FY 2020)	Anticipated monetary savings of $28,593 (FY 2020)	
Massachusetts	Home Energy Market Value Performance Program (Home MVP)	Department of Energy Resources	4,578,063/year as of May 2020		1,799.8 metric tons/year as of May 2020
Massachusetts	Rapid LED Streetlight Conversion Grant Program	Metropolitan Area Planning Council	33,917 kWh		10,122 metric tons as of June 2020
Montana	Alternative Energy Revolving Loan Program	Montana Department of Environmental Quality	499,653 kWh	$54,444	649,549 pounds (2020)
Nebraska	Dollar and Energy Savings Loans	Nebraska Department of Environment and Energy		$1,154,980 (2019)	
New Mexico	Sustainable Building Tax Credit (personal)	State Energy Office	16,776,195 source energy for 2019	$845,962 from 2019 projects	3,347 tons
New York	Low-Rise Residential New Construction Program	NYSERDA	98,000 kWh/most recent year		

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State	Title	Program administrator	Program-level energy savings	Program-level monetary savings	Estimated avoided CO_2 emissions
North Dakota	Energy Conservation Grant	Department of Commerce		Estimated $269,110 (July 2019 to June 2020)	
Oregon	Industrial Self-Direct of Public Purpose Funds	Oregon Department of Energy	1,634,309 kWh (2019)	$103,578 (2019)	599.8 $MTCO_2e$ (2019)
Rhode Island	Pascoag Utility District Energy Efficiency Program	Office of Energy Resources, Pascoag Utility District	262,000 kWh	$24,906	53.60 short tons in 2020
Tennessee	Energy Efficient Schools Initiative—Loans	Energy Efficient Schools Initiative	15,037,512 kWh (FY 2019)	$28 million	10,632 metric tons per year
Tennessee	Pathway Energy Efficiency and Renewable Energy Loan Program	Pathway Lending	14,603,160 kWh from 2019 loans	Average estimated annual energy savings of $37,365 per program participant for program year 2019	10,325 metric tons per year

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Appendix M. State Efficiency Spending and Savings Targets for Low-Income Customers

State	Spending/savings requirements for low-income energy efficiency programs
California	California Public Utilities Code Section 382(e) set a goal to provide low-income energy efficiency measures to 100% of eligible and willing customers by 2020. A. 14-11-007 (2016) strengthened the goal and updated interpretation of the "willing and feasible to participate" factor.
Connecticut	Utilities are required to allocate their limited-income budget in parity with the revenues expected to be collected from that sector. Public Act 11-80, Section 33, establishes a goal of weatherizing 80% of homes. This goal is not specific to low-income customers, but activity in the low-income program helps the companies achieve this goal. Also, as part of the performance management incentive (PMI) calculation, the utilities are required to spend at least 95% of their low-income budget. Electric, natural gas, oil, and propane savings metrics also fall under the low-income program attached to the PMI calculation.
Delaware	Delaware established legislative energy savings targets in 2009 with the adoption of SB 106. The legislation set up a Sustainable Energy Trust Fund to collect charges assessed by energy providers in service of energy savings goals. SB 106 specifies that 20% of assessments be provided to the Weatherization Assistance Program. The Delaware Weatherization Assistance Program has an annual goal of completing 400 homes. Electric utility restructuring legislation passed in 1999 specified that Delmarva Power and Light (DPL) collect 0.095 mills per kWh (approximately $800,000 annually) from customers to be forwarded to the Department of Health and Social Services, Division of State Service Centers, to be used to fund low-income fuel assistance and weatherization programs. To make low-income energy efficiency programs more accessible, a Guidance Document was drafted in 2016 as part of the merger settlement approved by the PSC between Exelon and Delmarva Power and Light to allocate $4 million of the funds toward low-income customer energy efficiency programs. This Guidance Document applies to DPL customers, and funds are available to support organizations delivering energy efficiency programs to low-income ratepayers. Organizations that receive grants to run low-income energy efficiency programs will increase energy efficiency measures for low-income Delaware households, increase statewide electric and gas savings, engage and inform low-income households about the benefits of energy efficiency, develop a community-based approach to address energy efficiency issues in low-income housing by mobilizing public and private-sector resources, and ensure to the greatest extent feasible that job training, employment, and contracting generated by this grant will be directed to low-income persons. All settlement-funded low-income programs must be officially recommended by the Energy Efficiency Advisory Council (EEAC) and approved by the PSC.
District of Columbia	The Clean and Affordable Energy Act (CAEA) of 2008 established a separate Energy Assistance Trust Fund to support: "(1) the existing low-income programs in the amount of $3.3 million annually; and (2) the Residential Aid Discount subsidy in the amount of $3 million annually." For the 2017–21 program cycle the low-income spending requirement was adjusted to 20% of expenditures.

State	Spending/savings requirements for low-income energy efficiency programs
Illinois	In December 2016, the Illinois State Legislature passed the Future Energy Jobs Bill (SB 2814). The legislation directs utilities to implement low-income energy efficiency measures of no less than $25 million per year for electric utilities that serve more than 3 million retail customers in the state (ComEd), and no less than $8.35 million per year for electric utilities that serve fewer than 3 million but more than 500,000 retail customers in the state (Ameren).
Maine	LD-1559, passed in June 2013, states that Efficiency Maine Trust shall "target at least 10% of funds for electricity conservation collected under subsection 4 or 4-A or $2,600,000, whichever is greater, to programs for low-income residential consumers, as defined by the board by rule."
Massachusetts	In the late 1990s, Massachusetts restructuring law established a low-income conservation fund through a 0.25 mills per kWh charge on every electric customer's bill. A conservation charge on natural gas customers' bills has funded natural gas low-income energy efficiency programs. In 2010 the program received additional funding through the 2008 Green Communities Act, which required that 10% of electric utility program funds and 20% of gas program funds be spent on comprehensive low-income energy efficiency and education programs. The legislation further directed that these programs be implemented through the low-income weatherization assistance program (WAP) and fuel assistance program network with the objective of standardizing implementation among all utilities. In addition to the WAP-coordinated programs that directly serve low-income clients, the utilities fund the Low-Income Multifamily Retrofit Program, which provides cost-effective energy efficiency improvements to multifamily buildings, including those owned by nonprofit and public housing authorities. The program is aimed at one- to four-unit residential buildings where at least 50% of the units are occupied by low-income residents earning at or below 60% of area median income. Eligible projects involve efficiency upgrades for buildings with currently high energy consumption, specifically for space heating, hot water, air sealing, and insulation of building envelopes, lighting, and appliances.
Michigan	SB 438, approved in December 2016, extended the state's 1% annual energy savings requirement for utilities through 2021. The bill does not specify a minimum required level of spending or savings for low-income energy efficiency programs, other than to direct that distribution customers' funding responsibilities for low-income residential programs be proportionate to the distribution customers' funding of the total energy optimization (EO) program: "The established funding level for low-income residential programs shall be provided from each customer rate class in proportion to that customer rate class's funding of the provider's total energy optimization programs."
Minnesota	Municipal gas and all electric utilities must spend at least 0.2% of their gross operating revenue from residential customers on low-income programs. Legislation in 2013 raised the minimum low-income spending requirement for gas IOUs from 0.2% to 0.4% of their most recent three-year average gross operating revenue from residential customers.

State	Spending/savings requirements for low-income energy efficiency programs
Montana	SB 150, passed in 2015, made changes to the state's system benefit fund, increasing a public utility's minimum funding level for low-income energy and weatherization assistance from 17% to 50% of the public utility's annual electric universal systems benefits level. A cooperative utility's minimum annual funding requirement for low-income energy assistance remains at 17% of its annual USB funding level. SB 150 also clarified that eligible projects can be located on tribal reservations.
Nevada	In July 2001 Nevada passed AB 661, which created the Nevada Fund for Energy Assistance and Conservation (FEAC) through a universal energy charge (UEC) assessed on retail customers of the state's regulated electric and gas utilities. Nevada's Energy Assistance Code specifies the UEC is 3.30 mills per therm of natural gas and 0.39 mills per kWh of electricity purchased by these customers. NRS 702.270 requires that 25% of the money in the FEAC be distributed to the Nevada Housing Division for programs of energy conservation, weatherization, and energy efficiency for eligible households. In June 2017, SB 150 was signed into law. It directs the Public Utilities Commission to establish annual energy savings goals for NV Energy and requires utilities to set aside 5% of efficiency program budgets for low-income customers.
New Hampshire	In August 2016 the New Hampshire Public Utilities Commission approved a settlement agreement establishing a statewide energy efficiency resource standard. The agreement provides for an increase in the minimum low-income share of the overall energy efficiency budget from 15.5% to 17%.
New Mexico	The state's energy efficiency targets, established in 2005 within the Efficient Use of Energy Act, were amended in 2019 with the passage of HB 291. The legislation calls for a 5% reduction of energy consumption as a percentage of 2020 sales by 2025 and also directs that no less than 5% of the amount received by the public utility for program costs shall be specifically directed to energy efficiency programs for low-income customers.
New York	In December 2018, the PSC ordered the development of a Statewide LMI Portfolio, to include ratepayer funded initiatives administered by NYSERDA and the utilities. The Order also required that a minimum of 20% of any additional energy efficiency investments through the utilities be directed to the LMI market segment. In January 2020, the PSC authorized utility specific LMI budgets, totaling a minimum of $289 million through 2025. Combined with the NYSERDA ratepayer funded LMI budget, the LMI Portfolio will include at least $650 million of new investments in LMI energy efficiency through 2025.
Oklahoma	Under OAC 165:35-41-4, all electric utilities under rate regulation of the Oklahoma Corporation Commission must propose, at least once every three years—and be responsible for the administration and implementation of—a demand portfolio of energy efficiency and demand response programs within their service territories. The regulations specify that demand portfolios must address programs for low-income and hard-to-reach customers "to assure proportionate Demand Programs are deployed in these customer groups despite higher barriers to energy efficiency investments."

State	Spending/savings requirements for low-income energy efficiency programs
Oregon	Senate Bill 1149, requiring electric industry restructuring for the state's largest investor-owned utilities, was signed into law in July 1999. The law established an annual expenditure by the utilities of 3% of their revenues to fund "Public Purposes," including energy efficiency, development of new renewable energy, and low-income weatherization. Per the legislation, 13% of the public purpose charge would be allocated to low-income weatherization through the Energy Conservation Helping Oregonians program.
Pennsylvania	In June 2015, the Pennsylvania Public Utility Commission issued an implementation order for Phase III of the Energy Efficiency and Conservation Program, setting five-year cumulative targets of 5.1 million MWh, equivalent to about 0.77% incremental savings, per year through 2020. The order also requires each utility to obtain a minimum of 5.5% of their total consumption reduction target from the low-income sector.
Texas	As amended by SB 1434 in June 2011, Substantive Rule § 25.181 states that "each utility shall ensure that annual expenditures for the targeted low-income energy efficiency program are not less than 10% of the utility's energy efficiency budget for the program year."
Vermont	Efficiency Vermont (EVT), the state's energy efficiency utility established in 1999, is funded through a systems benefits charge on all utility customers' bills. Most of the costs of the electric efficiency measures implemented by EVT and the community-based weatherization agencies are paid for by EVT, with any remaining balances covered by the federal Weatherization Assistance Program (WAP). Other funding for WAP comes from the state's Weatherization Trust Fund, which was created in 1990 through legislative enactment of a gross-receipts tax of 0.5% on all non-transportation fuels sold in the state. As specified by Vermont law, 50% of the net proceeds from the sale of carbon credits through the Regional Greenhouse Gas Initiative are deposited into a fuel efficiency fund to provide energy efficiency services to residential consumers who have incomes of no more than 80% of the state median income.
Virginia	The 2018 Grid Modernization and Security Act (SB966) required that at least 5% of energy efficiency programs benefit low-income, elderly, and disabled individuals. The 2020 Virginia Clean Economy Act increased this target to 15%.
Wisconsin	The Reliability 2000 Law, passed in 1999, created a program for awarding grants to provide assistance to low-income households for weatherization and other energy conservation services, payment of energy bills, and the early identification and prevention of energy crises. The law specifies that 47% of total low-income funds must be dedicated to weatherization. The legislation required the Department of Administration to collect $24 million for low-income public benefits services the first year and to calculate a low-income need target in subsequent years. This low-income need target is based on the estimated number of low-income families (households at or below 150% of the poverty level) multiplied by the estimated need per eligible household.

Appendix N. Cost-Effectiveness Rules for Utility Low-Income Efficiency Programs

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Arizona	Since 2011 Arizona Administrative Code Title 14, Chapter 2, Article 24 (R14-2-2412) has directed that "an affected utility's low-income customer program portfolio shall be cost effective, but costs attributable to necessary health and safety measures shall not be used in the calculation."
Arkansas	Arkansas does not require program-level cost effectiveness for low-income programs.
California	California applies the Energy Savings Assistance Program Cost Effectiveness test (ESACET) and the Total Resource Cost (TRC) test to the low-income program. These tests incorporate nonenergy benefits and are used for informational purposes only, with no set minimum threshold for cost effectiveness.
Colorado	Decision No. C08-0560 directs the Colorado Public Service Commission to pursue all cost-effective low-income demand-side management (DSM) programs, "but to not forgo DSM programs simply because they do not pass a 1.0 TRC test." It also directs that, in applying the TRC to low-income DSM programs, "the benefits included in the calculation shall be increased by 20%, to reflect the higher level of nonenergy benefits that are likely to accrue from DSM services to low-income customers." This was increased to 50% for low-income measures and products in April 2018 under Decision No. C18-0417. To avoid unintended impacts to calculations of benefits pursuant to performance incentives, the decision also allows utilities to exclude these costs in these determinations: "To address this concern we find that the costs and benefits associated with any low-income DSM program that is approved and has a TRC below 1.0 may be excluded from the calculation of net economic benefits. Further, the energy and demand savings may be applied toward the calculation of overall energy and demand savings, for purposes of determining progress toward annual goals."
Connecticut	Connecticut has established formal rules and procedures for evaluation, which are stated in Public Act 11-80 and Evaluation Rules and Roadmap. The Program Administrator test has been the primary cost-effectiveness test in Connecticut. However, the TRC test is the primary test for the Home Energy Solutions Limited-Income program. Connecticut regulators have repeatedly approved non-cost-effective low-income programs.
Delaware	The Evaluation, Measurement, and Verification Committee in 2016 recommended specific net-energy impacts or net-energy benefits for low-income programs. These include weatherization-reduced arrearages and participant health and safety benefits. Specific values were also applied to the net-energy benefits and are locked in for three years. These net-energy benefits were unanimously recognized and approved by the EEAC.
District of Columbia	While no specific rules are in place for low-income programs per se, programs that are not cost effective may be included in the DC Sustainable Energy Utility's portfolio as long as the overall portfolio is cost effective based on the Societal Cost test. A 10% adder is applied to program benefits to account for additional nonenergy benefits including comfort, noise reduction, aesthetics, health and safety, ease of selling/leasing the home or building, improved occupant productivity, fewer work absences due to reduced illnesses, ability to stay in one's home and avoid moves, and macroeconomic benefits.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Florida	Applying program-level cost-effectiveness tests to low-income energy efficiency programs is not required by the energy efficiency statutes in Florida.
Idaho	In April 2013 the PUC largely adopted its staff's recommendations from an October 2012 report regarding methodology for evaluating low-income weatherization assistance programs (LIWAP) and the criteria for increased funding (Order No. 32788, Case No. GNR-E-12-01). In this order, the PUC determined that a utility may "include a 10% conservation preference adder for their low-income weatherization programs," but that if the utility believes the adder would make its cost-effectiveness calculations inconsistent, then the company need not use the adder. The PUC encouraged the utilities to include nonenergy benefits of low-income weatherization assistance programs (LIWAPs) when calculating cost effectiveness but declined to construct a "specific cost-effectiveness test for low-income programs at this time." Instead, the PUC said it would continue reviewing LIWAPs on a case-by-case basis.
Illinois	Section 8-103B (Energy Efficiency and Demand-Response Measures) of SB 2814 excludes low-income energy efficiency measures from the need to satisfy the TRC test.
Indiana	Under Senate Bill 412 and Indiana Code 8-1-8.5-10(h), an electricity supplier may submit its energy efficiency plan to the commission for a determination of the overall reasonableness of the plan either as part of a general basic rate proceeding or as an independent proceeding. A petition submitted may include a home energy efficiency assistance program for qualified customers of the electricity supplier whether or not the program is cost effective.
Iowa	According to IAC 199–35.5(4)(c)(3), "Low-income and tree-planting programs shall not be tested for cost effectiveness, unless the utility wishes to present the results of cost-effectiveness tests for informational purposes."
Kansas	Low-income programs are not required to pass strict benefit–cost analysis so long as they are found to be in the public interest and supported by a reasonable budget.
Kentucky	Requirements for low-income programming are similar to those governing other programmatic offerings, and these were established by precedent in a 1997 proceeding surrounding the approval of LG&E's DSM program portfolio. The rules for benefit–cost tests are stated in Case No. 1997-083. These benefit–cost tests are required for total program-level screening, with exceptions for low-income programs, pilots, and new technologies. The commission also found in Case No. 97-083 that "If [a] filing fails any of the traditional [cost-effectiveness] tests, LG&E and its Collaborative may submit additional documentation to justify the need for the program."
Maine	Maine has not had specific cost-effectiveness guidelines in place for low-income programs. However, the cost-effectiveness test for all programs provides for consideration of nonenergy benefits including "reduced operations and maintenance costs, job training opportunities and workforce development, general economic development and environmental benefits, to the extent that such benefits can be accurately and reasonably quantified and attributed to the program or project."

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Maryland	In Order No. 87082 the PUC required cost-effectiveness screening for limited-income programs but indicated the programs may still be implemented without satisfying the test, stating: "We accept the recommendation of the Coalition that, while cost-effectiveness screening of the limited income sub-portfolio shall be required in the same manner as with respect to the other EmPOWER sub-portfolios, the results of the limited-income sub-portfolio screening shall serve as a point of comparison to other jurisdictions and past programmatic performance rather than as the basis for precluding certain limited-income program offerings."
Massachusetts	Massachusetts relies on the TRC test as its primary test for DSM programs but specifically calculates additional benefits from low-income programs in its benefit–cost ratio. DPU 08-50-B specifies that an energy efficiency plan must include calculations of non-electric benefits, specifically those related to: "(A) reduced costs for operation and maintenance associated with efficient equipment or practices; (B) the value of longer equipment replacement cycles and/or productivity improvements associated with efficient equipment; (C) reduced environmental and safety costs, such as those for changes in a waste stream or disposal of lamp ballasts or ozone-depleting chemicals; and (D) all benefits associated with providing energy efficiency services to Low-Income Customers." In 2010, in its 2010–12 Three-Year Plan Order, the Massachusetts Department of Public Utilities (DPU) ordered the program administrators to conduct a more thorough analysis of nonenergy impacts through evaluation studies. The DPU, with few exceptions, approved these studies. A study for the Massachusetts program administrators, conducted by NMR Group, incorporates findings from a review of the nonenergy impacts literature to quantify nonenergy benefits, including those for low-income programs.
Michigan	Sec. 71 (4)(g) of SB 438 appears to exempt low-income programs from demonstrating cost effectiveness. To demonstrate that the provider's energy waste reduction programs, excluding program offerings to low-income residential customers, will collectively be cost effective, SB 438 states: "An energy waste reduction plan shall . . . demonstrate that the provider's energy waste reduction programs, excluding program offerings to low-income residential customers, will collectively be cost effective."
Minnesota	The rules for benefit–cost tests are stated in MN Statutes 261B.241 and Rule 7690.0550. The benefit–cost tests are required for portfolio, total program, and customer project-level screening with exceptions for low-income programs. Subd 7(e) of 216B.241 directs that "costs and benefits associated with any approved low-income gas or electric conservation improvement program that is not cost effective when considering the costs and benefits to the utility may, at the discretion of the utility, be excluded from the calculation of net economic benefits for purposes of calculating the financial incentive to the utility. The energy and demand savings may, at the discretion of the utility, be applied toward the calculation of overall portfolio energy and demand savings for purposes of determining progress toward annual goals and in the financial incentive mechanism."
Mississippi	Mississippi does not require program-level cost effectiveness for low-income programs.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Montana	Montana specifies the TRC as its primary test for decision making. The benefit–cost tests are required for the individual measure level for program screening, but there are exceptions for low-income programs, pilots, and new technologies.
Nevada	Nevada Housing Division for programs of energy conservation, weatherization, and energy efficiency for eligible households does not require a cost–benefit analysis. Legislation in 2017 established that low-income programs do not have to pass cost-effectiveness screening as long as the portfolio of all DSM programs passes. Also, a nonenergy benefits adder of 25% is applied to low-income programs. Regular programs receive a 10% adder. Depending on the percentage of low-income participation in a program, the nonenergy benefits adder is adjusted using a weighted average formula.
New Hampshire	With respect to nonenergy benefits for low-income programs, as noted in Order No. 23,574, both low-income programs and educational programs could still be approved by the commission even if they do not surpass a 1.0 benefit–cost ratio given their additional hard-to-quantify benefits.
New Jersey	Implementation of a low-income energy efficiency program is required by New Jersey statute N.J.S.A. 48:3-61. In 2020 the Board of Public Utilities approved the New Jersey Cost Test, which includes a 10% adder for low-income benefits.
New Mexico	The Utility Cost test (UCT) is conducted in New Mexico and is considered the primary test for decision making and evaluating program cost effectiveness. HB 267 directs that "In developing this test for energy efficiency and load management programs directed to low-income customers, the commission shall either quantify or assign a reasonable value to reductions in working capital, reduced collection costs, lower bad-debt expense, improved customer service effectiveness and other appropriate factors as utility system economic benefits." It was later codified in New Mexico Administrative Code that "In developing the Utility Cost test for energy efficiency and load management measures and programs directed to low-income customers, unless otherwise quantified in a commission proceeding, the public utility shall assume that 20% of the calculated energy savings is the reasonable value of reductions in working capital, reduced collection costs, lower bad-debt expense, improved customer service, effectiveness, and other appropriate factors qualifying as utility system economic benefits" [17.7.2.9 NMAC–Rp. 17.7.2.9 NMAC, 1-1-15].
New York	New York screens programs at the measure level and requires each to have a TRC score of at least 1.0, with some exceptions. It appears that New York's TRC test does not explicitly address nonenergy benefits of low-income programs. However, the New York Public Service Commission (PSC) has generally recognized and considered low-income-specific benefits in deciding on funding for utility low-income programs. For example, in a 2010 order, the commission approved a low-income program with a TRC ratio of 0.91, finding that "As a general principle, all customers should have reasonable opportunities to participate in and benefit from Energy Efficiency Portfolio Standard (EEPS) programs. It is also important that supplemental funding be provided to address gas efficiency measures in this program."
North Carolina	North Carolina's low-income programs are generally not required to meet cost-effectiveness thresholds in order for utilities to provide energy efficiency programs to a sector of the population that would likely not otherwise participate in energy efficiency.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Oklahoma	Oklahoma Administrative Code (OAC) 165:35-41-4 directs that demand programs targeted to low-income or hard-to-reach customers may have lower threshold cost-effectiveness results than other efficiency programs.
Oregon	The rules for benefit–cost tests are stated in Docket UM 551, Order 94-590, which lays out a number of situations in which the PUC may make exceptions to the standard societal test calculation. Order 15-200, signed June 23, 2015, concerns Idaho Power Company's request for cost-effectiveness exceptions to its DSM programs. The commission adopted the recommendation of staff that cost-effectiveness requirements in Order 95-590 do not apply to low-income weatherization programs, such as the Weatherization Assistance for Qualified Customers Program.
Pennsylvania	In Order M-2015-2468992, the PUC specifies 2016 Total Resource Cost test requirements. Pennsylvania relies on the TRC test and considers it to be its primary cost-effectiveness test. A benefit–cost test is required for portfolio-level screening. The commission requires that the electric distribution companies provide benefit and cost data for both low-income and non-low-income residential program savings in their annual reports and that TRC tests be applied to all low-income programs and all residential programs. However, the commission does not require a separate PA TRC test calculation for the low-income sector.
South Carolina	South Carolina does not require program-level cost effectiveness for low-income programs.
Texas	In an order adopted September 28, 2012, the commission directed that low-income programs would not be required to meet the cost-effectiveness standard in Substantive Rule § 25.181, but rather would only need to meet standards required by the savings-to-investment ratio (SIR) methodology. All measures with an SIR of 1.0 or greater qualify for installation. The SIR is the ratio of the present value of a customer's estimated lifetime electricity cost savings from energy efficiency measures to the present value of the installation costs, inclusive of any incidental repairs, of those energy efficiency measures.
Utah	The rules for benefit–cost tests are stated in Docket No. 09-035-27. Utah uses the TRC test, Utility Cost test (UCT), Participant Cost test (PCT), and Ratepayer Impact Measure (RIM). Approval of individual DSM programs or portfolios of programs should be based on an overall determination that the program or portfolio is in the public interest after consideration of all four tests and the passage of the threshold test, the UCT. Utah also utilizes the PacifiCorp TRC (PTRC) test, which follows the Northwest convention of adding 10% to the avoided costs to account for unquantified environmental and transmission and distribution impacts.
Vermont	Vermont specifies the Societal Cost test to be its primary test for decision making. A 15% adjustment is applied to the cost-effectiveness screening tool for low-income customer programs.
Virginia	Virginia does not require program-level cost effectiveness for low-income programs.

State	Special cost-effectiveness provisions for low-income energy efficiency programs
Washington	Per WAC 480-109-100, low-income weatherization is not included in the portfolio or sector-level cost-effectiveness analysis. Companies may implement low-income programs that have a TRC ratio of 0.67 or above. The rules for benefit–cost tests are directed by the Energy Independence Act of 2006, codified in Chapter 194-37 WAC, which specifies that the TRC test include all nonenergy impacts that a resource or measure may provide that can be quantified and monetized. Washington also applies an additional 10% benefit to account for non-quantifiable externalities, consistent with the Northwest Power Act. In Docket UE-131723, signed March 12, 2015, the commission revised the rule language to allow, rather than require, utilities to pursue low-income conservation that is cost effective consistent with the procedures of the Weatherization Manual finding that "in recognition that low-income conservation programs have significant nonenergy benefits, we find it appropriate for utilities to maintain robust low-income conservation offerings despite the unique barriers these programs face."
Wisconsin	Administrative code requires programs for residential and nonresidential program portfolios to each pass portfolio-level cost effectiveness. One of the established reasons for setting portfolio-level testing rather than program- or measure-level testing is to provide more flexibility for low-income programs.

The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

January 31, 2022

D.P.U. 21-120

Petition of The Berkshire Gas Company, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-121

Petition of Eversource Gas Company of Massachusetts, d/b/a Eversource Energy, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-122

Petition of Fitchburg Gas and Electric Light Company, d/b/a Unitil (Gas Division), pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-123

Petition of Liberty Utilities (New England Natural Gas Company) Corp., d/b/a Liberty Utilities, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-124

Petition of Boston Gas Company, d/b/a National Grid, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-125

Petition of NSTAR Gas Company, d/b/a Eversource Energy, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-126

Petition of the towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Eastham, Edgartown, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, Wellfleet, West Tisbury, and Yarmouth, and Dukes County, acting together as the Cape Light Compact JPE, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-127

Petition of Fitchburg Gas and Electric Light Company, d/b/a Unitil (Electric Division), pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-128

Petition of Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

D.P.U. 21-129

Petition of NSTAR Electric Company, d/b/a Eversource Energy, pursuant to G.L. c. 25, § 21, for approval by the Department of Public Utilities of its Three-Year Energy Efficiency Plan for 2022 through 2024.

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I. INTRODUCTION AND PROCEDURAL HISTORY

On November 1, 2021, The Berkshire Gas Company ("Berkshire Gas"), Eversource Gas Company of Massachusetts, d/b/a Eversource Energy ("EGMA"), Fitchburg Gas and Electric Light Company, d/b/a Unitil (Gas Division) ("Unitil (gas)"), Liberty Utilities (New England Natural Gas Company) Corp., d/b/a Liberty ("Liberty"), Boston Gas Company, d/b/a National Grid ("National Grid (gas)"), NSTAR Gas Company, d/b/a Eversource Energy ("NSTAR Gas"), the Towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Eastham, Edgartown, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, Wellfleet, West Tisbury, and Yarmouth, and Dukes County, acting together as the Cape Light Compact JPE ("Compact"), Fitchburg Gas and Electric Light Company, d/b/a Unitil (Electric Division) ("Unitil (electric)"), Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid ("National Grid (electric)"), and NSTAR Electric Company, d/b/a Eversource Energy ("NSTAR Electric") (collectively "Program Administrators"), each filed a three-year energy efficiency plan with the Department of Public Utilities ("Department") for calendar years 2022 through 2024 ("Three-Year Plans").[1] The Program Administrators filed their Three-Year Plans pursuant to An Act Relative to Green Communities, St. 2008, c. 169,

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[1] The Department docketed these matters as follows: (1) D.P.U. 21-120 for Berkshire Gas; (2) D.P.U. 21-121 for Eversource Gas; (3) D.P.U. 21-122 for Unitil (gas); (4) D.P.U. 21-123 for Liberty; (5) D.P.U. 21-124 for National Grid (gas); (6) D.P.U. 21-125 for NSTAR Gas; (7) D.P.U. 21-126 for the Compact; (8) D.P.U. 21-127 for Unitil (electric); (9) D.P.U. 21-128 for National Grid (electric); and (10) D.P.U. 21-129 for NSTAR Electric.

codified at G.L. c. 25, §§ 19, 21-22, as amended by An Act Relative to Competitively Priced Electricity in the Commonwealth, St. 2012, c. 209 ("Energy Act of 2012"), by An Act to Advance Clean Energy, St. 2018, c. 227 ("Energy Act of 2018"), by An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, St. 2021, c. 8 ("Climate Act") (collectively "Green Communities Act"), and Investigation by the Department of Public Utilities on its own Motion into Updating its Energy Efficiency Guidelines, D.P.U. 20-150-A (May 3, 2021) ("Guidelines").[2]

Each Program Administrator seeks approval of its Three-Year Plan, including proposed programs, program budgets, cost-recovery mechanisms and, with the exception of the Compact, a proposed performance incentive mechanism. Pursuant to the Energy Act of 2012, the Program Administrators also have incorporated their Residential Conservation Services ("RCS") filings in their respective Three-Year Plans. St. 2012, c. 209, § 32(h), (i).

On November 2, 2021, the Attorney General of the Commonwealth of Massachusetts ("Attorney General") filed, pursuant to G.L. c. 12, § 11E, a notice of intervention as a full party in each Three-Year Plan docket. On November 8, 2021, the Department granted the petitions to intervene as full parties in each Three-Year Plan docket of the Massachusetts

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[2] The Guidelines set forth the filing requirements and memorialize the process by which the Department reviews and evaluates the Three-Year Plans. D.P.U. 20-150-A at 1-3. In addition, on October 5, 2021, the Department issued a Procedural Memorandum directing (or, in some instances, reminding) each Program Administrator to provide certain additional information with its Three-Year Plan filing. 2022-2024 Three-Year Energy Efficiency Plans, D.P.U. 21-120 through D.P.U. 21-129, Procedural Memorandum (October 5, 2021).

Department of Energy Resources ("DOER"), Conservation Law Foundation ("CLF"), Low-Income Weatherization and Fuel Assistance Program Network and the Low-Income Energy Affordability Network (together, "LEAN"), Acadia Center ("Acadia"), Northeast Energy Efficiency Council ("NEEC"), and Massachusetts Energy Marketers Association ("MEMA"). Also, on November 8, 2021, the Department granted the petition of Sunrun Inc. ("Sunrun") to intervene as a full party in D.P.U. 21-126 through D.P.U. 21-129. Further, on November 8, 2021, the Department granted the petition to intervene as a full party of National Grid (gas) in D.P.U. 21-126. D.P.U. 21-126, Hearing Officer Ruling at 4 (November 8, 2021). Finally, on November 29, 2021, the Department granted limited participant status to New England Geothermal Professional Association, Inc. ("NEGPA") in each Three-Year Plan docket and to Northeast Clean Energy Council ("NECEC") in D.P.U. 21-126, D.P.U. 21-128, and D.P.U. 21-129. D.P.U. 21-120 through D.P.U. 21-129, Interlocutory Order on Petitions to Intervene of New England Geothermal Professional Association, Inc. and Northeast Clean Energy Council, Inc. (November 29, 2021).

Pursuant to notice duly issued,[3] the Department held two joint public hearings on December 1 and 2, 2021.[4] The Program Administrators sponsored the testimony of

[3] On December 14, 2021, the Department received a motion for leave to file comments out of time from CPower Energy Management ("CPower"). As grounds for its filing comments late, CPower asserts that it engaged in discussions with the Program Administrators to address its concern but was not able to resolve this issue in a timely manner to meet the Department's December 3, 2021 deadline for filing comments (CPower Motion at 1).

A late-filed request will be disallowed as untimely unless good cause is shown for waiver under 220 CMR 1.01(4). Given the 90-day review period for these proceedings, the Department must adhere closely to the established procedural schedule. Accordingly, we find that CPower has not established good cause for filing comments almost two weeks after the deadline for public comments. See Investigation of the Department of Public Utilities, on its own Motion, Commencing a Rulemaking, D.P.U. 16-64-C at 3 n.2 (2016); Joint Petition for Approval of Merger between NSTAR and Northeast Utilities, D.P.U. 10-170-B at 7 n.4 (2012). Accordingly, the Department does not consider the late-filed comments of CPower in ruling on the instant Three-Year Plans.

[4] The Department held joint public hearings in each docket. These cases, however, are not consolidated and remain separate proceedings.

39 internal witnesses.[5,6] In addition, intervenors sponsored the testimony of six witnesses.[7] The Department held four days of evidentiary hearings on December 9, 10, 13, and 14, 2021.[8]

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5 The following internal witnesses provided testimony on behalf of the Program Administrators in their respective dockets: (1) Jennifer Boucher, Hammad Chaudhry, and Glen Eigo (Berkshire Gas); (2) Alexandra Abbruscato, Ashley Botelho, Brandy Chambers, Tracy Dyke-Redmond, Erin Engelkemeyer, Ruth Georges, Jennifer Gray Benford, Brian Greenfield, Frank Gundal, John Kibbee, Collin Nantovich, William O'Connor, Katherine Peters, and Tilak Subrahmanian (NSTAR Electric, NSTAR Gas, and EGMA); (3) Cindy Carroll, Mary Downes, and Deborah Jarvis (Unitil (gas) and Unitil (electric)); (4) Kimberly Dragoo, Stephanie Terach; and Autumn Snyder (Liberty); (5) Marie Abdou, Grayson Bryant, Beth Delahaij, Melanie Coen, Amanda Formica, David Gibbons, Gregory Krantz, Antonio Larson, Ezra McCarthy, Steve Menges, Christopher Porter, Tomi Uyehara, and Paul Wissink (National Grid (electric) and National Grid (gas)); and (6) Margaret Downey, Briana Kane, and Margaret Song (Compact).

6 Berkshire Gas sponsored the testimony of one external witness, Matthew Siska of GDS Associates (Exh. Berkshire-2). The Compact sponsored the testimony of two external witnesses, Patrick Knight and Erin Malone of Synapse Energy Economics, Inc. (Exh. Compact-2).

7 CLF sponsored the testimony of Paulina Casasola of Clean Water Action and Luisa de Paula Santos of Community Labor United. MEMA sponsored the testimony of one internal witness, Michael Ferrante, and the following four external witnesses: (1) Raymond Albrecht of Raymond J. Albrecht, LLC; (2) Dr. Thomas Butcher of the National Oil Heat Research Alliance; (3) Matthew Herman of the National Biodiesel Board; and (4) Joseph Uglietto of Diversified Energy Specialists, Inc.

8 The Department held joint evidentiary hearings on December 9, 10, and 13, 2021, on common issues. The Department also held a Compact-specific evidentiary hearing on December 14, 2021.

On December 29, 2021, the Program Administrators (jointly), Attorney General, DOER, Acadia, CLF, LEAN, NEEC,[9] MEMA, and NEGPA filed briefs in each docket; National Grid (gas) and the Compact filed supplemental briefs in D.P.U. 20-126; NECEC filed a brief in D.P.U. 21-126, D.P.U. 21-128, and D.P.U. 21-129; and Sunrun filed a brief in D.P.U. 21-126 through D.P.U. 21-129. On January 6, 2022, the Program Administrators (jointly), Attorney General, DOER, Acadia, CLF, LEAN, and MEMA filed reply briefs in each docket; and National Grid (gas) and the Compact filed supplemental reply briefs in D.P.U. 21-126. The evidentiary record in each docket includes numerous exhibits and the Program Administrators' responses to five record requests.[10,11]

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9 NEEC filed a letter in lieu of brief noting its "full support" for all arguments presented in the initial brief of NECEC (NEEC Brief at 1). Accordingly, the arguments of NECEC set forth herein also represent those of NEEC.

10 The combined total number of exhibits for all dockets is approximately 3000. Tr. 4, at 651; D.P.U. 21-120 through D.P.U. 21-129, Joint Exhibit List (December 6, 2021).

11 On its own motion, the Department strikes those portions of the responses to RR-DPU-1 and RR-DPU-3 that are unresponsive in that they go beyond the narrow scope of the information sought by the record requests and constitute extra-record evidence. The evidentiary record in these proceedings remained open to receive responses to the record requests (Tr. 4, at 651). Such responses become part of the evidentiary record unless challenged as unresponsive and stricken in whole or in part. Electronic Filing Guidelines, D.P.U. 15-184-A, App. I (Standard Ground Rules), at G. Providing information beyond the scope of that sought by the record request constitutes supplemental testimony that is extra-record evidence, which is prejudicial and inappropriate without a motion to reopen the record upon a showing of good cause. 220 CMR 1.11(8); D.P.U. 15-184-A, App. I (Standard Ground Rules), at G. See, e.g., Western Massachusetts Electric Company, D.T.E. 98-51, at 9 (1998). No such motion was filed, or showing made, here. Further, regarding RR-DPU-3, the Department conducted a procedural teleconference with the Program Administrators to

II. BACKGROUND

A. Development of Three-Year Plans

Pursuant to the Green Communities Act, all Program Administrators are required to develop energy efficiency plans that "provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." G.L. c. 25, § 21(b)(1). The Green Communities Act establishes an Energy Efficiency Advisory Council ("Council")[12] and directs Program Administrators, in

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further clarify the information to be provided—and the information to be excluded—from RR-DPU-3 prior to filing, and the Program Administrators still filed a response with supplemental, unrequested, extra-record information that could not be tested on cross-examination.

With respect to the response to RR-DPU-1, the Department strikes the two full paragraphs on page 2, the entire portion of page 3 following the bullet list, and pages 4 and 5 in their entirety. The attachments to RR-DPU-1 are not stricken and are part of the evidentiary record in these proceedings. With respect to RR-DPU-3, the Department strikes everything appearing in the response after the third sentence. Footnote 1 and the attachments to RR-DPU-3 are not stricken and are part of the evidentiary record in these proceedings.

[12] The Council's 15 voting members represent the following interests: (1) residential consumers; (2) the low-income weatherization and fuel assistance program network; (3) the environmental community; (4) businesses, including large commercial and industrial end-users; (5) the manufacturing industry; (6) energy efficiency experts; (7) organized labor; (8) the Commonwealth of Massachusetts Department of Environmental Protection ("DEP"); (9) the Attorney General; (10) the Commonwealth of Massachusetts Executive Office of Housing and Economic Development; (11) the Massachusetts Non-profit Network; (12) a city or town in the Commonwealth of Massachusetts; (13) the Massachusetts Association of Realtors; (14) a business employing fewer than ten persons located in the Commonwealth of Massachusetts that performs energy efficiency services; and (15) DOER. G.L. c. 25, § 22(a). The Council membership also includes one non-voting member representing each Program Administrator, one from the heating oil industry, one from ISO New England Inc. ("ISO-NE"), and one from energy efficiency businesses. G.L. c. 25, § 22(a).

coordination with the Council, to prepare a three-year, statewide energy efficiency plan ("Statewide Plan"). G.L. c. 25, § 21(b)(1).

Programs contained in the energy efficiency investment plan (i.e., the Statewide Plan) may include, but are not limited to: (1) efficiency and load management programs, including programs for energy storage and other active demand management technologies and strategic electrification; (2) demand response programs; (3) programs for research, development, and commercialization of products or processes that are more energy-efficient than those generally available; (4) programs for the development of markets for such products and processes, including recommendations for new appliance and product efficiency standards; (5) programs providing support for energy use assessment, real time monitoring systems, engineering studies and services related to new construction or major building renovation, including integration of such assessments, systems, studies and services with building energy codes programs and processes, or those regarding the development of high performance or sustainable buildings that exceed code; (6) programs for the design, manufacture, commercialization, and purchase of energy-efficient appliances and heating, air conditioning, and lighting devices; (7) programs for planning and evaluation; (8) programs providing commercial, industrial, and institutional customers with greater flexibility and control over demand-side investments funded by the programs at their facilities; (9) programs for public education regarding energy efficiency and demand management; and (10) programs that resulted in customer switching to renewable energy sources or other clean energy technologies. G.L. c. 25, § 21(b)(2).

Pursuant to G.L. c. 25, § 21(c), the Program Administrators must submit a draft Statewide Plan to the Council every three years on or before April 30th. The Council must then review the Statewide Plan and submit its approval or comments to the Program Administrators not later than three months after submission of the draft Statewide Plan.[13] The Program Administrators may make any changes or revisions to the draft Statewide Plan to reflect the input of the Council. G.L. c. 25, § 21(c).

Every three years, each Program Administrator also must develop and file with the Department an individual Three-Year Plan based on the Statewide Plan. G.L. c. 25, § 21(d)(1). On or before October 31st of the applicable year, each Program Administrator must submit its Three-Year Plan to the Department together with the Council's approval or comments and a statement of any unresolved issues. G.L. c. 25, § 21(d)(1).

The Department is required to conduct a public hearing to allow interested persons to be heard on the Three-Year Plans. G.L. c. 25, § 21(d)(1). Within 90 days of the filing date, the Department must approve, modify, or reject and require the resubmission of the Three-Year Plans. G.L. c. 25, § 21(d)(2).

As required by the Green Communities Act, the Council worked with the Program Administrators to develop the energy efficiency programs and budgets in the Statewide Plan.

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[13] The Council's statutory role in the development of the Statewide Plan concludes three months after submission of the Statewide Plan by the Program Administrators at which time the Council must offer its approval or comments to the Program Administrators. G.L. c. 25, § 21(c). Approval of a Statewide Plan requires a two-thirds majority vote of the Council. G.L. c. 25, § 22(b).

G.L. c. 25, § 22(b). As part of the development of the Statewide Plan, the Program Administrators participated in six sector-specific workshops convened by the Council and nine public comment listening sessions in 2020 and 2021 (Statewide Plan, Exh. 1, App. A at 46). On March 24, 2021, the Council issued a resolution containing certain recommendations to the Program Administrators (Statewide Plan, Exh. 1, App. A at 46). The Program Administrators also participated in several meetings of an equity working group[14] convened by the Council and held one-on-one meetings with various stakeholders related to the development of the Statewide Plan (Statewide Plan, Exh. 1, at 7, 20 & App. A at 46-47).

Consistent with G.L. c. 25, § 21(c), the Program Administrators filed the draft Statewide Plan with the Council on April 30, 2021. The Council issued a resolution three months later on July 28, 2021, providing comments on the Statewide Plan (Statewide Plan, Exh. 1, App. L at 1-16). Following the passage of the July resolution, the Council continued to meet with the Program Administrators to provide further input on the development of the Statewide Plan (Statewide Plan, Exh. 1, App. A at 47). On September 22, 2021, the Program Administrators submitted draft benefit-cost ratio ("BCR") screening models and energy efficiency data tables to the Council, and on October 6, 2021, the Program Administrators submitted an additional draft Statewide Plan to the Council

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[14] The equity working group was established by the Council and includes members that were not appointed by the Department pursuant to G.L. c. 25, § 22. The Department is not clear whether the working group operated pursuant to open meeting law, G.L. c. 30A, § 20.

(Statewide Plan, Exh. 1, App. A at 47).

The Council provided additional input to the Program Administrators at several Council and one-on-one meetings throughout October 2021 (Statewide Plan, Exh. 1, App. A at 47). On October 25, 2021, the Program Administrators, the Attorney General, and DOER reached a 40 page "Term Sheet" agreement that served, in part, as a guide for the Program Administrators to finalize the Statewide Plan (Statewide Plan, Exh. 1, App. M).[15] On October 27, 2021, the Council unanimously passed a resolution supporting the final Statewide Plan and the Program Administrators' respective Three-Year Plans, to the extent they are consistent with the Statewide Plan (Statewide Plan, Exh. 1, App. N). Finally, five days later on November 1, 2021, the Program Administrators filed their Three-Year Plans with the Department.[16]

B. Department Review of Three-Year Plans

Pursuant to the Green Communities Act, each Program Administrator's Three-Year Plan must provide for the acquisition of all available energy efficiency resources that are cost

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15 The Term Sheet includes a number of "key terms" agreed to by the Program Administrators, the Attorney General, and DOER to be included in the final Statewide Plan (Statewide Plan, Exh. 1, App. M at 5-8). The Term Sheet also describes a number of approaches, goals, and policies that were not included in the Statewide Plan (Statewide Plan, Exh. 1, App. M at 2-10). The Term Sheet is addressed in Section IV.D.3.f.iv., below.

16 Because October 31, 2021 fell on a Sunday, each Program Administrator filed its Three-Year Plan on the next succeeding business day consistent with G.L. c. 4, § 9 (when the last day for the performance of any act authorized or required by statute falls on Sunday or a legal holiday, the act may be performed on the next succeeding business day).

effective or less expensive than supply. G.L. c. 25, §§ 19(a), 21(a), 21(b)(1), 21(b)(2), 21(d)(2). Further, a Program Administrator must demonstrate that it will meet its resource needs first through cost-effective energy efficiency and demand reduction resources in order to mitigate capacity and energy costs for all customers. G.L. c. 25, §§ 19(a), 19(b), 21(a), 21(b)(1); see also Guidelines § 3.4.7. The Three-Year Plans must provide for the acquisition of these resources with the lowest reasonable customer contribution. G.L. c. 25, § 21(b)(1).

A Program Administrator must demonstrate that its Three-Year Plan: (1) establishes a sustainable effort in its continued delivery of energy efficiency; (2) considers new technologies and enhancements; (3) includes the results of avoided costs, potential studies, and evaluation, measurement, and verification ("EM&V") studies; and (4) seeks to design programs to address identified barriers. Guidelines § 3.4.7; 2013-2015 Three-Year Energy Efficiency Plans, D.P.U. 12-100 through D.P.U. 12-111, at 37-40 (2013) ("2013-2015 Three-Year Plans Order"). In addition, when reviewing the Three-Year Plans, the Department must ensure that the Program Administrators: (1) have minimized administrative costs to the fullest extent practicable; (2) will use competitive procurement processes to the fullest extent practicable; and (3) have allocated to the low-income sector at least ten percent of the funds for electric energy efficiency programs and 20 percent of the funds for gas energy efficiency programs. G.L. c. 25, §§ 19(a), (b), (c), 21(b)(3).

On March 26, 2021, the Governor signed the Climate Act into law, effective June 24, 2021. St. 2021, c. 8. The Climate Act makes certain changes to the Green Communities Act and the Global Warming Solutions Act, St. 2008, c. 298 ("GWSA"). In particular, the

Climate Act requires the Secretary of Energy and Environmental Affairs ("EEA") to set a goal, every three years, for the necessary contributions of the Statewide Plan to meeting each greenhouse gas ("GHG") emissions limit and sublimit adopted under the GWSA. St. 2021, c. 8, § 9; see G.L. c. 21N, § 3B. Each Three-Year Plan must be constructed to meet the GHG emissions reduction goals set by the Secretary of EEA pursuant to G.L. c. 21N, § 3B. St. 2021, c. 8, §§ 26A, 28; D.P.U. 20-150-A at 7, 50; Guidelines § 3.4.7.

For the purpose of evaluating cost effectiveness, the Green Communities Act, as amended by the Energy Act of 2018, provides that review occurs at the sector level (i.e., residential, low income, and commercial and industrial ("C&I")). St. 2018, c. 227, § 6; see G.L. c. 25, § 21(b)(3). If a sector BCR exceeds one, then the sector is deemed to be cost effective. St. 2018, c. 227, § 6; see G.L. c. 25, § 21(b)(3). If, however, a sector fails the cost-effectiveness test, then its component programs shall be modified so that the sector is cost effective, or the program must be terminated. St. 2018, c. 227, § 6; see G.L. c. 25, § 21(b)(3). The Climate Act also requires that when determining cost-effectiveness the calculation of benefits must include the "social value of GHG emissions reductions, except in the cases of conversions from fossil fuel heating and cooling to fossil fuel heating and cooling." St. 2021, c. 8, § 21; see G.L. c. 25, § 21. In addition, the Climate Act requires that the Department and the entities it regulates (e.g., the Program Administrators) prioritize safety, security, reliability of service, affordability, equity, and reductions in GHG emissions to meet statewide GHG emission limits and sublimits established pursuant to G.L. c. 21N. St. 2021, c. 8, § 15; see G.L. c. 25, § 1A. The

Department addresses these priorities on a case-by-case basis as relevant to each proceeding. See, e.g., Massachusetts Municipal Wholesale Electric Company, D.P.U. 21-29, at 31 n.15 (2021); Boston Gas Company, D.P.U. 21-GC-10, at 3-4 (2021).

The Department has found that in the pursuit of all cost-effective energy efficiency, the Program Administrators must balance the additional flexibility in program design and implementation afforded by sector-level cost-effectiveness review under the Energy Act of 2018, with bill impacts and the prudent use of ratepayer funds. 2019-2021 Three-Year Energy Efficiency Plans, D.P.U. 18-110 through D.P.U. 18-119, at 72-74 (2019) ("2019-2021 Three-Year Plans Order"). In doing so, the Program Administrators must consider cost-efficiency, as well as cost-effectiveness.[17]

Finally, to recover costs related to energy efficiency, electric Program Administrators must first fund the Three-Year Plans from other revenue sources.[18] The Department may also approve funding from gas and electric ratepayers through a fully reconciling funding

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17 To assess cost-efficiency and, thereby, the prudence of expenditures, the Department requires the Program Administrators to report cost-effectiveness at the program and core initiative levels, in addition to the sector level. 2019-2021 Three-Year Plans Order, at 73-74; see also 2013-2015 Three-Year Plans Order, at 105; 2019-2021 Three-Year Energy Efficiency Plans, D.P.U. 18-110 through D.P.U. 18-119, Hearing Officer Procedural Memorandum at 2 n.1 (October 3, 2018).

18 The revenue sources are (1) a mandatory $0.0025 per kilowatt-hour ("kWh"), system benefits charge ("SBC"), (2) revenues from the forward capacity market ("FCM"), administered by ISO-NE, (3) revenues from cap-and-trade pollution control programs (e.g., Regional Greenhouse Gas Initiative ("RGGI")), and (4) other funding sources. Guidelines § 3.2.1; see also G.L. c. 25, § 19(a).

mechanism, after considering the rate and bill impacts on consumers. G.L. c. 25, § 19(a), (b); Guidelines §§ 3.2.1; 3.2.2.

III. OVERVIEW OF PROCEEDING AND THREE-YEAR PLAN DEVELOPMENT

In this Order, the Department approves the gas and electric Program Administrators' 2022-2024 Three-Year Plans, with modifications. G.L. c. 25, § 21(d)(2). Under the Three-Year Plans, the Program Administrators will invest approximately $4.0 billion in energy efficiency and demand reduction resources that will cost-efficiently reduce energy use and demand. Over the next three years, pursuant to the directives in this Order, the Program Administrators will work to motivate customers to optimize their energy use in a manner that lowers costs for customers and reduces GHG emissions. The 2022-2024 Three-Year Plans, consistent with the Energy Act of 2018, emphasize strategic electrification[19] and improve equitable access to energy efficiency programs by reducing barriers to participation for customers that historically have yet to participate in these programs. Consistent with the requirements of the Climate Act, the energy efficiency programs are designed to contribute their share of GHG emissions reductions to achieve the Commonwealth's aggressive 2030 GHG emissions reduction targets and continue progress towards net-zero emissions by 2050. The Three-Year Plans contain the roadmap to achieve these goals; however, the

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[19] By including strategic electrification in the Three-Year Plans, the Legislature has established a pathway to decarbonize portions of the building sector in an optimal manner. As discussed below, strategic electrification within the context of the energy efficiency programs maximizes the effectiveness of electrification by ensuring that customers weatherize buildings and adopt right-sized heating equipment that lowers a customer's net energy use.

achievement of these goals will be based entirely on motivating customer decisions and acceptance of the measures offered under the Three-Year Plans. Achieving the energy and GHG emissions reduction goals will require cooperation among stakeholders to educate and motivate customers across the Commonwealth to embrace energy efficiency through the Mass Save programs.

The Department recognizes the efforts of the Program Administrators and stakeholders to develop the Three-Year Plans, as well as the significant ongoing efforts across the Commonwealth to further our state's energy and environmental policies. The Department is responsible for overseeing the Program Administrators' implementation of the Three-Year Plans to ensure that each Program Administrator pursues all cost-effective energy efficiency and demand reduction resources in a sustained manner and executes its programs in a way that also achieves the GHG reduction goals set pursuant to G.L. c. 21N, § 3B. In addition, ensuring the Program Administrators prioritize affordability, equity and GHG emissions reductions, as well as safety, reliability, and security, has been a central aspect of the Department's review of the Three-Year Plans and the Department examines each of these elements throughout the Order.

In our review of a Three-Year Plan, the Department examines the costs and bill impacts of the proposed programs from both a participant and non-participant perspective to ensure customers experience bill reductions from the energy efficiency measures adopted and ratepayers receive benefits through reduced overall energy system costs commensurate with the proposed budget. 2013-2015 Three-Year Plans Order, at 122-123; D.P.U. 08-50-A

at 58. The Department also assesses affordability of the programs in consideration of short-term bill impacts balanced against long-term benefits. Investigation by the Department of Public Utilities on its own Motion into Updating its Energy Efficiency Guidelines, D.P.U. 08-50-D at 11-12 (2012). As electrification efforts expand, ensuring affordability is of particular importance to ensure the cost of electricity remains affordable for customers in order to continue the progress towards decarbonization without overburdening customers.

In assessing equity, the Department requires the Program Administrators to dedicate certain portions of their budgets solely for the implementation of low-income programs to ensure that the Three-Year Plans benefit our most vulnerable residents. The Department also requires the Program Administrators to address barriers to participation to ensure all customers can access and benefit from the energy savings opportunities supported under the Green Communities Act. See, e.g., 2016-2018 Three-Year Energy Efficiency Plans, D.P.U. 15-160 through D.P.U. 15-169, at 26 (2016) ("2016-2018 Three-Year Plans Order") (approving renter specific offering, enhanced incentives for moderate income customers, assessment of the effectiveness of the small business program); 2013-2015 Three-Year Plans Order, at 46-47 (approving a community partnership program that targeted increased participation from lower income and working-class communities).

Achieving GHG emissions reductions has been a central focus of the energy efficiency programs since the passage of the GWSA, and the Department requires the Program Administrators to assess and track the GHG emissions impact of their programs. 2013-2015 Three-Year Plans Order, at 43-44 (finding the three-year plans supported the

emissions reduction targets in the 2020 Climate Plan). In this Order, the Department ensures that the 2022-2024 Three-Year Plans are constructed consistent with the GHG emissions reduction goals established pursuant to G.L. c. 21N, § 3B. At the same time, the Department requires the Program Administrators to assess the impact the programs, particularly strategic electrification, have on the distribution system to avoid unintended reliability issues, while also ensuring that the programs are delivered in a safe manner.

Under the Green Communities Act, the Department must review each element of the Three-Year Plans and adjudicate all disputes related to the proposed programs within 90 days. G.L. c. 25, § 21(d)(2). Completing a full, fair, and thorough evaluation of every element of the Three-Year Plans in this short amount of time is an extremely important but difficult task.[20] The Department must dedicate significant resources to these proceedings to meet this statutory deadline. Therefore, it is imperative that a Three-Year Plan be complete, accurate, and reviewable the day it is filed, as well as clearly supported by testimony to minimize the need for discovery and evidentiary hearings. The Department has developed and refined Guidelines and filing requirements over the years to ensure that the Department and stakeholders have sufficient and accurate information to review the filing within the 90-day period. D.P.U. 08-50-B at 4-5; see generally Investigation by the Department of Public Utilities on its own Motion into Updating its Energy Efficiency Guidelines, D.P.U. 20-150-A (2021); Investigation by the Department of Public Utilities on its own

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[20] In comparison, pursuant to G.L. c. 164, § 94, the Department has ten months to adjudicate a distribution rate case filing.

Motion into Updating its Energy Efficiency Guidelines, D.P.U. 11-120-A (2013). In addition, given the evolving landscape of energy policy and the continuous transformation of the energy efficiency market, the Department issues a pre-filing memorandum to identify any additional information the Program Administrators must include in their filings to facilitate the Department's review and reduce the need for discovery. See, e.g., D.P.U. 21-120 through D.P.U. 21-129, Hearing Officer Procedural Memorandum at 2-3 (October 5, 2021) ("Pre-Filing Memorandum"); D.P.U. 18-110 through D.P.U. 18-119, Procedural Memorandum (October 3, 2018). Despite this guidance and repeated directives to file clear, complete, accurate, and fully supported Three-Year Plans, the Department is disheartened with the problems and deficiencies that arose upon our review of the 2022-2024 Three-Year Plans filings.

This is the fourth Three-Year Plan the Program Administrators have filed with the Department and they have been running nation-leading energy efficiency programs for more than a decade. The Program Administrators have demonstrated that they are more than capable of planning and executing regulatory filings on tight deadlines. In developing and executing their energy efficiency investment plans, the Program Administrators have proven to be adaptable — incorporating cutting edge technologies and embracing changing policies that fundamentally challenge traditional utility company roles. They have done this in a manner that has allowed the Department to review and understand complex new processes and how they relate to current policy and legislation. However, these Three-Year Plan filings were a step in the wrong direction.

First, as noted above, in a Three-Year Plan filing (or any regulatory filing), it is imperative that the filing contain all required information, is accurate, and reviewable. Documents should be easy to follow, allow for efficient review, and be as free from errors as possible. A Three-Year Plan must contain all elements identified in G.L. c. 25, §§ 19, 21 and required by the Department. In these Three-Year Plans, several required elements were missing or included in appendices in a way that made them difficult to discover. The Department had to issue multiple rounds of discovery to gather information that should have been included in the initial filings and supplement information that was incomplete or unclear (see, e.g., Exhs. DPU-Comm 3-1; DPU-Comm 3-2; DPU-Comm 4-1 through DPU-Comm 4-3; DPU-Comm 5-1; DPU-Comm 6-1 through DPU-Comm 6-8).[21] The Department directed the Program Administrators to provide pre-filed testimony addressing certain issues we have previously recognized as priorities. However, the Program Administrators largely ignored these directives and either did not provide the required testimony, provided incomplete testimony, or provided common statewide testimony, disregarding the directive to provide service territory-specific information.[22] Of particular concern is the incompleteness of the required testimony on potential studies. The Program

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21 This is not a complete list of the additional discovery required.

22 For example, in the Pre-Filing Memorandum at 2, the Department requested Program Administrator-specific testimony with how the Program Administrators addressed participation barriers for renters, hard-to-reach communities, municipalities, healthcare facilities, education institutions, non-profits, the hospitality industry, and small and medium size businesses. Instead, the Program Administrators provided only identical, high-level testimony (see, e.g., Exh. BGC-2, at 67-69).

Administrators are required to conduct territory-specific potential studies and provide individual testimony on how each Program Administrator incorporated the findings of its own potential study in the development of its own savings goals during the planning process. 2019-2021 Three-Year Plans Order, at 38; Pre-Filing Memorandum at 2. Instead, the Program Administrators provided generic, high-level testimony that did not even include any reference to their individual potential study results (see, e.g., Exh. BGC-2, at 21-36).[23]

Further, since 2012, the Department has repeatedly stated that the Program Administrators must address the participation barriers and achievement of deeper participant savings for renters. See 2019-2021 Three-Year Plans Order, at 39, 41-43, 95; 2016-2018 Three-Year Plans Order, at 26-27; 2013-2015 Three-Year Plans Order, at 45-48. Accordingly, the Program Administrators knew that the review of their plan for serving renters is a top priority of the Department. In testimony, the Program Administrators explained at a high level how they served renters in the 2019-2021 Three-Year Plan term[24]

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[23] During the investigation of the 2019-2021 Three-Year Plans, the Program Administrators repeatedly argued that potential studies should be service-territory specific and use different methods to ensure the studies produce actionable information based on each Program Administrator's unique service-territory characteristics. 2019-2021 Three-Year Plans Order, at 18-19. However, the testimony provided in these proceedings does not discuss the actionable information for each Program Administrator.

[24] The Program Administrators highlight that in 2019-2021, the renter energy savings packages were a key element of their service to renters (see, e.g., Exh. EGMA-2, at 58). These packages included light bulbs, faucet aerators, and smart strips (Statewide Plan, Exh. 1, at 50). However, the Program Administrators planned to stop offering lighting measures and, at the time of the Three-Year Plan filings, could not identify what would be included in the renter energy savings package going

and the results of certain studies (see, e.g., Exh. EGMA-2, at 56-61). However, for the 2022-2024 Three-Year Plan term, the Program Administrators indicated that they will not develop their renter strategic plan until the second quarter of 2022 and will not roll out the strategy until the second half of 2022 (Statewide Plan, Exh. 1, App. M at 9). The strategies that the Program Administrators intend to implement should be developed prior to and included in the Three-Year Plans. Waiting to develop core strategies, particularly strategies for serving hard-to-reach customers, until after filing the Three-Year Plans with the Department, is not consistent with the Green Communities Act. As discussed in Section IV.D.3.a.ii below, the Department now must expend additional administrative resources to review the proposal at a later date.

Further, as discussed in Section V.D.1 below, the Department previously directed the Program Administrators to undertake a study on the best practices for minimizing administrative costs and adopt the recommendations of the study. 2019-2021 Three-Year Plans Order, at 50; 2016-2018 Three-Year Plans Order, at 42. Specifically, the Department directed the Program Administrators to work with the Council to develop a formal process to address Council data requests in a way that balances the reporting of beneficial data/information and the minimization of administrative costs. D.P.U. 20-150-A at 12 n.9. Not only did the Program Administrators not submit the formal process with this filing, they

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forward (Statewide Plan, Exh. 1, at 50). Instead, the Program Administrators merely stated that the renter energy savings packages would "continue to evolve" (Statewide Plan, Exh. 1, at 50).

developed the draft proposal for Council consideration less than two weeks before filing the Three-Year Plans (Exh. DPU-Comm 10-13 (Rev.)). On January 20, 2022, almost three months after the Three-Year Plans were filed with the Department (and less than two weeks before the statutory deadline to issue this Order), the Program Administrators finally submitted the proposal for Department review. The lack of action by the Program Administrators to advance the Council data request proposal in a timely manner is troubling. Again, the Department will need to expend administrative resources to review a proposal that should have been finalized well before these proceedings.

Regarding the substance of the filings, the Department is disappointed in the multiple inaccuracies and incomplete information provided by the Program Administrators in the Three-Year Plans.[25] Similar to the renter strategic plan discussed above, the filing includes references to multiple key plans or proposed protocols that will not be developed until months after the conclusion of the Department's review. For example: (1) a proposal for allowing mixed-income buildings to participate in the low-income programs will not be developed until the second quarter of 2022; (2) the final portion of the budget the Program Administrators intend to use to target environmental justice communities will be adjusted by

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[25] A significant portion of each Three-Year Plan was dedicated to discussing priorities and describing areas of future exploration; however, the actual program descriptions were limited and high level. Key elements of program designs were scattered throughout multiple sections and appendices in the filings. Going forward, the Program Administrators shall include in their Three-Year Plans, full descriptions of each program (including structure, eligibility requirements, measures, and incentive levels), presented in a more comprehensive and clear manner.

the end of the second quarter of 2022; and (3) the development of key performance indicators to assess performance will not occur until the first quarter of 2022 (Statewide Plan, Exh. 1, App. M at 8, 19, App. N at 10). The initial Three-Year Plan filings also included errors in data tables, which the Program Administrators knew about but still filed with the Department (see, e.g., Exh. NG-Electric-2, at 144-145). During the proceeding, the Department discovered multiple additional data anomalies, including but not limited to NSTAR Electric incorrectly projected its SBC revenues in its initial filing; the proposed EM&V budget in the Three-Year Plans and pre-filed testimony was not consistent with the Energy Efficiency Data Tables; and the National Grid (gas) program planning and administration ("PP&A") Budget Table was inconsistent with the National Grid (gas) Budget Table — a discrepancy of about $13 million (Statewide Plan, Exh. 1, at 179; App. C, Table IV.C.1; see, e.g., NSTAR Electric-2, at 82; Exh. NSTAR Electric-4 (Rev.), Table IV.B.3.1; Exh. NG-Gas-4 (Rev.)). In addition, the threshold triggers for the electrification component were inconsistently described as either 50 or 60 percent of benefits (Statewide Plan, Exh. 1, at 27-29).

Some aspects of the Program Administrators' equity proposal, which is a priority strategy for this Three-Year Plan term, were confusing and inaccurate. For example, the equity component of the performance incentive mechanism states the payout rates for this component are determined by "dividing the portion of the performance incentive pool allocated to the equity component by the planned statewide benefits from eligible equity measures" (Statewide Plan, Exh. 1, App. A at 28 (emphasis added)). In response to a discovery question from the Department requesting that the Program Administrators identify

these measures, the Program Administrators responded that they "have not defined any measure as an equity measure" (Exh. DPU-Comm 3-1). Further, a cornerstone proposal of the Program Administrators' equity efforts is the Community First Partnership Program; however, during evidentiary hearings, the Program Administrators disclosed that they had already issued an application for the program even though they had not yet finalized the criteria for priority communities (Tr. 2, at 249-250). As a result, several municipalities were rendered ineligible for priority status, while others were made newly eligible (Tr. 2, at 260). The Department had to spend time during multiple days of evidentiary hearings sorting through the criteria for the Community First Partnership Program, the reasons for the change in the criteria, and whether municipalities were even notified of the change. The lack of clear explanations from the Program Administrators raises questions about the transparency of the process and criteria used to develop the proposal. This put the Department in the difficult position of needing to rehabilitate an essential proposal to improve service to customers that have historically lower participation rates during our 90-day review period.

In light of the significant changes the Program Administrators propose in this filing and the corresponding budget increase ($1.2 billion or 29.3 percent) compared to the 2019-2021 Three-Year Plans' budget, the Department would expect a clearer, more detailed filing that was structured in a reviewable manner and consistent with the Department's Guidelines and directives. While stakeholders and the Council work with the Program Administrators for almost a year to develop the Three-Year Plan filings, the Department has 90 days to review the filing and adjudicate any issues that arise. Accordingly, the

Department also expects that the Three-Year Plans would be drafted in a manner that transparently explains the proposed programs and ensures that the Department can perform an efficient review.

The Department recognizes that some of these issues are the result of significant changes in the draft Statewide Plan in the month before the Three-Year Plans were filed with the Department. Key program designs, including the changes to the Community First Partnership Program and the decision to remove certain measures from the plan,[26] were made days before the Three-Year Plans were filed. In addition, the proposed avoided cost assumptions were not finalized until days before the filings were made (e.g., social value of GHG emissions reductions discount rate) (Program Administrators Brief at 45, citing Statewide Plan Exh. 1, App. Q, Study 3, at 4-5, 8-20; Exhs. DPU-Comm 1-1; DPU-Comm 11-1). The Department understands that certain minor changes in the plan values and filing may occur close to a filing deadline. However, program eligibility standards and essential underlying avoided costs are not the type of last-minute changes that are appropriate to be made so close to the filing of a multi-billion dollar, ratepayer funded Three-Year Plan. Such actions erode the credibility of the foundational elements that these Three-Year Plans have been built on.

With regard to the avoided energy supply cost study, the Department has previously endorsed the Avoided Energy Supply Components in New England: 2021 Report

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[26] These issues are discussed further in Section IV.D.3.

("AESC Study") group process as key to producing reliable avoided cost values to include in the Three-Year Plans. See 2019-2021 Three-Year Plans Order, at 68. The avoided costs form the basis of the benefits used in the Three-Year Plans and the assessment of cost-effectiveness. Establishing reliable benefits early in the planning process is essential to allow the Program Administrators and stakeholders to assess the cost-effectiveness of proposed measures and determine how to develop Three-Year Plans that capture all available cost-effective energy efficiency. Accordingly, the Department will no longer accept supplemental avoided cost studies that are completed after the submission of the April 30th draft Statewide Plan.

Based on the issues described above and others addressed herein, the Department would have sufficient grounds to reject the filing because it was not compliant with our standards and requirements.[27] However, as a practical matter, the Department will not reject the Three-Year Plan filings based solely on the Program Administrators' filing and procedural deficiencies. Unlike other filings, the energy efficiency plans are designed solely for the purpose of delivering energy saving measures to customers. Further, as discussed above, the energy efficiency programs are an essential pathway to meeting the

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[27] It is a general principle that the Department has no duty to rehabilitate a company's deficient filing through discovery. Fitchburg Gas and Electric Light Company, D.T.E. 99-110 (Phase II) at 54-55 & n.37 (2001). Instead, discovery is intended to reduce hearing time, narrow the scope of issues, protect the rights of the parties, and ensure that a complete and accurate record is compiled. 220 CMR 1.06(5)(c)(1). Further, the burden of proof rests with the company, as the proponent of the approval of its petition. See also Aquarion Water Company of Massachusetts, D.P.U. 08-27, at 32 (2009); Bay State Gas Company, D.P.U. 05-27, at 93-96 (2005).

Commonwealth's GHG emissions reduction goals. Accordingly, the Department finds that rejecting these Three-Year Plans outright would not be in the best interest of ratepayers.

While the quality of the Three-Year Plan filings are in question, the Program Administrators' overall ability to implement the Three-Year Plans and continue to deliver nation-leading energy efficiency services is not in question. The Department must acknowledge the nation-leading status of the Program Administrators; their innovation and success in the area of energy efficiency remains a cornerstone of the Commonwealth's clean energy policy. The recognition of this excellence only deepens our disappointment with the poor quality of these filings. As discussed in Section VII.D.2 below, the Department will address the filing deficiencies and other issues in the form of a reduction to the performance incentive pool.[28]

The Department recognizes the work that the Program Administrators, DOER, the Attorney General, LEAN, the Council, and other stakeholders must undertake during the development of a Statewide Plan under the Green Communities Act. We also acknowledge that the timing of the passage of the Climate Act created additional challenges. The Climate Act, as discussed above, required the inclusion of new benefits in the benefit cost screening model and required the EEA Secretary to establish the GHG emissions reduction goals for

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[28] In Section VII.D.2 below, the Department reduces the proposed performance incentive pool by ten percent. The Department emphasizes that a continued failure by the Program Administrators to comply with Department directives, or if the Program Administrators' future filings are deficient, the Department will further reduce or eliminate performance incentives.

the Three-Year Plans. While the draft Statewide Plan was submitted to the Council on April 30, 2021, the EEA Secretary, consistent with St. 2021, c. 8, § 106, established the GHG emissions reduction goal on July 15, 2021 (Statewide Plan, Exh. 1, App. D). This timing created a challenge for the Program Administrators and for the Council, which has a clear and defined statutory role in the Statewide Plan development process.

The Council's role in reviewing the Statewide Plan is set forth in G.L. c. 25, § 21(c). The Program Administrators submit a draft Statewide Plan to the Council on April 30th every three years. The Council then "shall review the [Statewide Plan] and any additional information and shall submit its approval or comments to the [Program Administrators] not later than [three] months after submission of the [Statewide Plan]." The Program Administrators then "may make any changes or revisions to reflect the input" of the Council prior to filing the Three-Year Plans with the Department on or before October 31st. G.L. c. 25, § 21(c).

In its statutorily authorized advisory capacity, the Council should provide either an approval of the draft Statewide Plan or comments. Between the time the Council issues its resolution on the draft Statewide Plan and the submission of the Three-Year Plans to the Department, the Program Administrators are expected to modify the draft Statewide Plan to address the Council's recommendations or provide a statement and justification of any unresolved issues. G.L. c. 25, § 21(d)(1). Accordingly, given that the EEA Secretary's GHG emissions reduction goals were finalized approximately two weeks prior to the

Council's resolution, it is understandable that some additional coordination and Council input was required in the development of this final Statewide Plan.

While a certain amount of additional coordination is appropriate under the circumstances, the Program Administrators are still responsible for ensuring that they develop and file complete and accurate Three-Year Plans with the Department by the deadline established by statute. The Council's advisory role cannot interfere with the Department's statutory role in reviewing the Three-Year Plans and determining whether to approve the use of ratepayer funds for the programs. In future years, the GHG emissions reduction goals will be set prior to the filing of the April 30th draft Statewide Plan thereby alleviating the timing challenges experienced in the development of these Three-Year Plans. Nevertheless, the Department finds that the Program Administrators must take certain steps in the future to ensure that their Three-Year Plan filings are complete, accurate, and reviewable. In addition, the Program Administrators must ensure that the Statewide Plan development process is sufficiently transparent to ensure that stakeholders are made aware of any significant revisions from the draft to final Statewide Plan.

During prior three-year energy efficiency planning cycles, while not envisioned by the Green Communities Act, the Program Administrators continued to work with the Council and stakeholders to resolve issues after the Council issued its July resolutions. In particular, the Program Administrators worked with DOER and the Attorney General to develop term sheets setting forth certain agreements that served as a guide for the Program Administrators to finalize the Statewide Plan. Based on the term sheets, the Program Administrators submitted

a revised draft Statewide Plan to the Council, which since 2009, has then voted in support of the Statewide Plan days before the Program Administrators submit their final three-year plans to the Department for review and approval (see, e.g., Statewide Plan, Exh. 1, App. N).

While the Department supports the Program Administrators' collaboration with the Council and other stakeholders to reach consensus and narrow areas of dispute, this process has not led to a complete resolution of all issues in a timely manner that is consistent with the Green Communities Act. See generally 2019-2021 Three-Year Plans Order; 2016-2018 Three-Year Plans Order; 2013-2015 Three-Year Plans Order. The timing of this collaboration, in relation to the filing deadline with the Department, negatively impacts the ability of the Program Administrators to develop and present a complete, accurate, and reviewable Three-Year Plan filing, including quality testimony to support all elements of the filing.[29] Further, if the Program Administrators are still in discussions with DOER, the Attorney General, and the Council on key elements of the programs late in the process, the Program Administrators cannot also focus on compliance with the Department's filing requirements and directives, as described above. Finally, last-minute changes to the

[29] For example, it was not initially clear to the Department whether the Program Administrators agreed or disagreed with the Council's resolution and comments because this information was not provided with the initial filing (Exh. DPU-Comm 10-9, Att.).

Statewide Plan prompted by these ongoing discussions impact stakeholders' ability to formulate informed positions on the changes.[30]

To address the issues described above, the Department will require the Program Administrators to submit a final written response to the Council's comments or recommendations no later than 45 days after the Council issues the July resolution required by G.L. c. 25, § 21(c).[31] In this response, the Program Administrators shall include a summary of each Council recommendation or comment, and specify whether and how the Program Administrators intend to address the issue in the Three-Year Plans. The Program Administrators also shall include a description of any program design changes from the draft Statewide Plan that they intend to incorporate in the Three-Year Plans filed with the Department, regardless of whether these changes were prompted by the Council's comments. The Program Administrators shall not be permitted to make any further substantive changes to the Statewide Plan after submitting their final written response to the Council.[32]

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30 For example, last-minute changes to the Statewide Plan may impact a stakeholder's decision on whether to petition to intervene or otherwise participate in the Three-Year Plan proceedings.

31 Because the GHG emissions reduction goals are finalized prior to the filing of the April 30th draft Statewide Plan, the Department does not expect or anticipate significant disagreements between the Program Administrators and the Council surrounding savings goals in the Statewide Plan.

32 The Program Administrators shall submit the Council's resolution and their final response with the Three-Year Plans filings. See G.L. c. 25, § 21(d).

We emphasize again, the Department has only 90 days to review the Three-Year Plans, which we have recognized is not ideal given the size and increasing complexity of the filings before us. As we have discussed above, in order to ensure that the Department can perform its statutorily mandated review of the Three-Year Plans to determine whether they meet the requirements of the Green Communities Act, it is imperative that the initial filings are complete, accurate, reviewable, and consistent with all Department policies, directives, and precedent. Requiring the Program Administrators to submit a final written response to the Council's comments or recommendations no later than 45 days after the Council's July resolution and fixing the time when substantive changes to the draft Statewide Plan can be made should ensure that the Program Administrators have a sufficient opportunity to finalize their Three-Year Plans to the standard the Department requires. It will also preserve the ability of the Program Administrators to work collaboratively with the Council and stakeholders during the 45-day period (which is in addition to the months of collaboration before the July resolution) to address the issues raised in the Council's resolution and attempt to narrow the areas of dispute.[33] Finally, it will put stakeholders on notice of anticipated changes to the draft Statewide Plan and allow them to formulate their positions on the issues of interest, prior to the start of the Department's 90-day review.

As much as the Program Administrators require sufficient time to finalize the Three-Year Plans before they are filed with the Department, they also must be able to

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[33] The Department will also meet with the Council's consultants to ensure the Department process and guidance are being incorporated into the planning process.

dedicate their staff resources to support the investigation of the Three-Year Plans after they are filed with the Department. In this regard, the Department notes that the Program Administrators filed four motions for extension of time to provide discovery responses and two motions seeking additional time to respond to record requests. D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Motion for Extension of Time to Respond to RR-DPU-4 (December 16, 2021); D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Revised Motion for Extension of Time to Respond to RR-DPU-3 (December 15, 2021); D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Motion for Extension of Time to Respond to DPU-Comm 10-12 (November 30, 2021); D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Motion for Extension of Time to Respond to DPU-Comm 10-6, DPU-Comm 10-7, and DPU-Comm 10-9 (November 26, 2021); D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Supplemental Motion for Extension of Time to Respond to DPU-Comm 3-2, DPU-Comm 3-7, DPU-Comm 3-15, and DPU-Comm 3-16 (November 18, 2021); D.P.U. 21-120 through D.P.U. 21-129, Program Administrators' Motion for Extension of Time to Respond to the Department's Third Set of Common Information Requests (November 17, 2021).

In the November 18, 2021 motions for extension of time to respond to discovery, the Program Administrators cited as good cause their staff's competing need to prepare for and present at a November 17, 2021 Council meeting. Similarly, in the initial December 14, 2021 motions for extension of time to respond to a record request, the Program

Administrators cited as good cause their staff's competing need to prepare for and present at a December 16, 2021 Council meeting.[34] While the Council may hold meetings during the Department's review of the Three-Year Plans, the Program Administrators' participation in those meetings cannot in any way impede the Department's review of the Three-Year Plans. As we have stated above, the Department must review the individual goals, budgets, programs, and supporting documentation of ten Program Administrators and issue an Order within 90 days. Responding to discovery and record requests in a timely manner is essential to facilitate an efficient adjudicatory proceeding. The need for Program Administrator staff to prepare for competing Council meetings during the 90-day Department review period should not be offered as good cause for any future extension requests. Further the Program Administrators shall not participate in any Council meetings from the date the Three-Year Plans are filed with the Department through filing of briefs. This directive does not alleviate the Program Administrators of their statutory obligation to file quarterly reports with the Council pursuant to G.L. c. 25, § 22(d).

IV. ALL COST-EFFECTIVE ENERGY EFFICIENCY

A. Introduction

The Green Communities Act requires each Program Administrator's Three-Year Plan to provide for the acquisition of all available cost-effective energy efficiency resources.

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[34] The Program Administrators filed a revised motion on December 15, 2021 that did not include the conflict with the December 16, 2021 Council meeting as grounds to grant the motion.

G.L. c. 25, §§ 19(a), 19(b), 21(a), 21(b)(1); see also Guidelines § 3.4.7. In addition, the EEA Secretary must set a goal for the necessary contributions of the Statewide Plan to meeting each GHG emissions limit and sublimit adopted under the GWSA. G.L. c. 21N, § 3B. Each Three-Year Plan must be constructed to meet the GHG emissions reduction goals set by the EEA Secretary pursuant to G.L. c. 21N, § 3B. St. 2021, c. 8, §§ 26A, 28; D.P.U. 20-150-A at 7, 50; Guidelines § 3.4.7. In order to achieve this mandate, the Program Administrators coordinate with the Council to develop the programs contained in the Statewide Plan. G.L. c. 25, § 21(b)(1). The Department requires that the Program Administrators use a net lifetime all fuel savings metric for each energy efficiency program and core initiative. Guidelines § 3.4.7.2.[35] The net lifetime all fuel savings goal is measured in MMBtus, inclusive of the embedded energy used to generate the electricity. D.P.U. 20-150-A at 50; 2019-2021 Three-Year Plans Order, at 156-157.

When reviewing the individual savings goals, the Department must ensure that each Program Administrator demonstrates that its Three-Year Plan (1) establishes a sustainable effort in its continued delivery of energy efficiency, (2) has considered new technologies and enhancements, (3) has included the results of avoided costs, potential and EM&V studies, and (4) has sought to design programs to address identified barriers. 2019-2021 Three-Year Plans Order, at 10-11; 2016-2018 Three-Year Plans Order, at 25-27; 2013-2015 Three-Year Plans Order, at 37-40. These issues are relevant to the Department's ultimate determination

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[35] The Department also requires that Program Administrators to report net savings by fuel and electric demand savings. Guidelines § 3.4.7.2.

of whether the Three-Year Plans will provide for the acquisition of all available cost-effective energy efficiency and demand reduction resources. See G.L. c. 25, §§ 19(a), 19(b), 21(b)(1).

B. Program Administrators Proposal

1. Plan Goals

The Program Administrators set savings goals and GHG emissions reduction goals for the term, both individually and in the aggregate (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.), C.2 – Gas (Rev.)). The Program Administrators calculated the net lifetime all fuel savings goal by converting all savings to MMBtu savings (Statewide Plan, Exh. 1, App. A at 3). When converting electric savings, the Program Administrators used conversion factors to account for the embedded energy with heat values from a mix of fuels that generate the electricity (Statewide Plan, Exh. 1, App. A at 3). The aggregate MMBtu savings and GHG emissions reduction goals, and each Program Administrator's individual savings and GHG emissions reduction goals, are shown below in Tables 1 and 2, respectively.

Table 1: Individual Electric Program Administrator Goals (2022-2024 Term Total)[36]

	Lifetime Savings (MMBtus)	Avoided GHG Emissions (metric tons CO_2e in 2030)
National Grid (electric)	64,787,408	248,871
NSTAR Electric	54,103,563	188,338
Unitil (electric)	1,013,084	3,317
Compact	9,906,529	35,009
Aggregate Statewide Goal	129,390,960	474,518

Table 2: Individual Gas Program Administrator Goals (2022-2024 Term Total)[37]

	Lifetime Savings (MMBtus)	Avoided GHG Emissions (metric tons CO_2e in 2030)
National Grid (gas)	62,349,032	207,694
NSTAR Gas	23,116,686	78,356
EGMA	23,976,009	75,324
Unitil (gas)	594,239	2,475
Berkshire	1,511,687	4,814
Liberty	1,624,516	5,533
Aggregate Statewide Goal	113,172,168	374,195

[36] Sources: For aggregate electric statewide savings and GHG emissions reduction goals, Statewide Plan, Exh. 1, App. C.1 – Electric (Rev.). For each electric Program Administrator, see, e.g., Exh. FGE Electric-4 (Rev.), Tab "Savings," Columns Y, AC, Row 127.

[37] Sources: For aggregate gas statewide savings and GHG emissions reduction goals, Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.). For each gas Program

On July 15, 2021, the EEA Secretary established the GHG emissions reduction goals for the current Statewide Plan. The Secretary established an overall goal to reduce CO_2e emissions by 845,000 metric tons by 2030, with 504,000 metric tons allocated to the electric Program Administrators and 341,000 metric tons allocated to the gas Program Administrators (Statewide Plan, Exh. 1, App. D at 3, Table 1).

According to the Program Administrators, the Statewide Plan incorporates the EEA Secretary's total goal to reduce 845,000 metric tons of CO_2e by 2030 (Statewide Plan, Exh. 1, Apps. C.1-Electric (Rev.) at 30; C.2 – Gas (Rev.) at 25). The Program Administrators propose to revise the allocation of this total goal to the gas and electric Program Administrators from the allocation established by the EEA Secretary (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.) at 30; C.2 – Gas (Rev.) at 25). In particular, the Program Administrators propose to allocate 475,018 metric tons of CO_2e emissions reductions to the electric Program Administrators and 370,898 metric tons of CO_2e emissions reductions to be delivered by the gas Program Administrators (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.) at 30; C.2 – Gas (Rev.) at 25). The Program Administrators' proposed reallocation involves the shifting 28,982 metric tons of CO_2e emissions reductions from the electric allocation to the gas allocation (see, e.g., Exh. NSTAR Gas-2, at 37). In other words, the Program Administrators propose to count approximately 30,000 metric tons of CO_2e emissions reductions from the gas Program Administrators towards the electric

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Administrator, see, e.g., Exh. EGMA-4 (Rev.), Tab "Savings," Columns Y, AC, Row 127.

Program Administrators' goal where the emissions reductions are derived from projects involving gas-to-electric fuel switching (see, e.g., Exh. NSTAR Gas-2, at 37).

In setting the goals listed above, the Program Administrators state that they considered: (1) the need for long-term program sustainability; (2) the directives, priorities, and recommendations of the Council and other stakeholders; (3) avoided costs; (4) the Department's directives in prior energy efficiency Orders; (5) customer bill impacts; (6) cost drivers; (7) energy efficiency potential studies;[38] (8) recent EM&V study results; (9) efficiency standards; and (10) the Program Administrators' experience implementing energy efficiency programs (Statewide Plan, Exh. 1, App. A at 8-14). Each Program Administrator set an individual goal that they state accounts for multiple service territory-specific factors, including: (1) the mix of customers, markets, venders, and building types; (2) customer demographics; (3) population density; (4) economic conditions; (5) penetration of natural gas and delivered fuels; and (6) depth of community engagement (Statewide Plan, Exh. 1, App. A at 13; see, Exh. DPU-Comm 6-1).

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[38] To provide them with a better understanding of the remaining technical, economic, and achievable energy efficiency savings opportunities within their service territories, each Program Administrator states that it completed an energy efficiency potential study that was consistent in terms of timing, formatting, and definition, with a common statewide deadline (Statewide Plan, Exh. 1, App. A at 11).

2. Offerings and Enhancements

a. Sector Based Strategic Enhancements

i. Residential Sector

The Program Administrators propose several new efforts in the residential sector for the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, at 64). During the term, the Program Administrators seek to increase participation by pursuing more equitable distribution of program benefits to all customers (Statewide Plan, Exh. 1, at 65-68).[39] The Program Administrators intend to implement a Community First Partnership Program,[40] a new version of their 2019-2021 Municipal and Community Partnership Strategy, which prioritizes

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39 In the context of energy efficiency, the Program Administrators define equity as "the process of establishing more equal access to and participation in energy efficiency programs, particularly among those groups who have historically participated at lower rates, including renters/landlords, moderate-income customers, and English-isolated families" (Statewide Plan, Exh. 1, at 17, 65).

40 While the Program Administrators refer to the Community First Partnership Program as a program, the Program Administrators did not include the Community First Partnership Program in the Energy Efficiency Data Tables or BCR model as a separate program. The Three-Year Plan must include sufficient information to allow the Department to review each energy efficiency program (i.e., descriptions, budgets, savings goals, customer participation rates, BCRs, all relevant assumptions underlying the cost-effectiveness evaluation). Guidelines § 3.4; D.P.U. 08-50-B at 11. The Department is aware that the Program Administrators refer to many of their offerings as programs, such as the Community First Partnership Program and ConnectedSolutions Program (https://www.masssave.com/saving/residential-rebates/connectedsolutions-batteries). In the interest of transparency and to avoid customer confusion, going forward the Program Administrators shall include all program offerings, using the full name as marketed to customers, in their three-year plans. Each of these programs shall be presented as a separate program in all data tables and screened separately for cost-effectiveness.

partnerships[41] with municipalities and community-based organizations focused on increasing participation rates and addressing barriers to participation for hard-to-reach customers (Statewide Plan, Exh. 1, at 68-70). The Program Administrators also propose to develop and implement a rental unit strategic plan with tactics to increase renter and landlord participation and agree to finalize the strategic plan by the third quarter of 2022 (Statewide Plan, Exh. 1, at 22, 67 & App. M at 9).

The Program Administrators also plan to enhance their workforce development plan to grow and diversify the workforce supporting energy efficiency programs (Statewide Plan, Exh. 1, at 70-73). Specifically, the Program Administrators will seek to expand the energy efficiency and HVAC workforce by recruiting and training individuals that live in environmental justice communities speak languages in addition to English, and are low-to-moderate income (Exh. DPU-Comm 13-9).

In order to increase participation, the Program Administrators also propose a series of short- and long-term strategies to provide flexibility to participate in the programs, as well as address barriers to participation, including time and lack of understanding (Statewide Plan, Exh. 1, at 81). For example, the Program Administrators intend to: (1) continue to use virtual home energy assessments and remote verification of installations, which were developed during the COVID-19 pandemic to provide customer flexibility to safe

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41 The Program Administrators define partnerships as "intentionally designed relationships with public and private entities to decrease all customers' energy burden and increase decarbonization" (Statewide Plan, Exh. 1, at 68).

participation in the programs; (2) examine facilitated pre-weatherization barrier mitigation, such as assisting customers with locating contractors for knob and tube wiring remediation or combustion safety issues; and (3) simplify and accelerate rebate application process (Statewide Plan, Exh. 1, at 81).

For moderate-income customers, the Program Administrators aim to increase participation through new and enhanced weatherization and HVAC incentives and streamlining the income verification process (Statewide Plan, Exh. 1, at 66). The Program Administrators propose to offer a 100 percent weatherization incentive for moderate-income customers, in addition to an increased incentive for installing weatherization measures as a prerequisite to new HVAC equipment (Statewide Plan, Exh. 1, at 66).

The Program Administrators additionally propose to implement a language access plan by 2023 to increase participation of limited English-proficiency customers in all sectors, with a $9.14 million budget (Statewide Plan, Exh. 1, at 22, 68). The proposed language access plan will describe how to provide services to limited English-proficiency individuals, including people who speak the most commonly spoken languages in the Commonwealth after English (e.g., including Spanish, Portuguese, and Mandarin) (Statewide Plan, Exh. 1, at 22, 49-50, 68). The Program Administrators further state that they will partner with multilingual community-based organizations, translate materials into the most commonly spoken languages, and establish a process so that customers who speak additional languages that are widely spoken in the Program Administrators' territories are able to access and participate in energy efficiency programs (Statewide Plan, Exh. 1, at 22, 68, 140, 145). Finally, the

Program Administrators state they will continue efforts from the 2019-2021 Three-Year Plan term to reach service-territory specific limited English-proficiency populations through targeted marketing and educational outreach to communities where English is not the primary language (Statewide Plan, Exh. 1, at 183-184).

The Program Administrators also plan to continue to offer residential financing options (Statewide Plan, Exh. 1, at 115). All residential customers are eligible to apply for a HEAT Loan on qualified measures, including HVAC and building envelope improvements (Statewide Plan, Exh. 1, at 115). The HEAT Loans are offered at zero percent interest to customers, up to a total of $25,000 (Statewide Plan, Exh. 1, at 115). For the 2022-2024 Three-Year Plan term, the Program Administrators plan offer a specific electrification HEAT Loan of up to $25,000, including up to $5,000 for electrification barriers such as electrical panel upgrades, for customers who install heat pumps in their homes (Statewide Plan, Exh. 1, at 116).

In addition to measure-specific offerings, the Program Administrators plan to continue their Residential Education program which provides educational outreach to teach grades K-12+ students how to be efficient energy consumers (Statewide Plan, Exh. 1, at 117-118). Through this program, the Program Administrators provide educator workshops on the science of energy, introduction to energy efficiency, integrating energy efficiency into other subject areas, insulation and air infiltration, and energy audit tools (Statewide Plan, Exh. 1, at 118). Educators are also provided kits with materials needed to implement the lessons in their classrooms and learning environments (Statewide Plan, Exh. 1, at 118).

The Program Administrators also provide resources for students, including science fair project ideas, energy information and resources guides, youth participation awards, and leadership opportunities (Statewide Plan, Exh. 1, at 118). In addition to the student resources, some of the Program Administrators use hands-on, interactive exhibits and games at community-based events in their service areas to further conduct outreach to K-12 students (Statewide Plan, Exh. 1, at 118).

For the 2022-2024 Three-Year Plan term, the Program Administrators plan to leverage the Residential Education programs to further their efforts to increase outreach to hard-to-reach communities with lower-than-average historical participation (Statewide Plan, Exh. 1, at 119). Specifically, as a complement the Community First Partnership Program, the Program Administrators plan to introduce the Mass Save Energy Efficiency Education Grant which will offer community-based organizations an enhanced opportunity to participate in residential education efforts by partnering with the Program Administrators to offer energy efficiency outreach and education geared toward renters, landlords, limited English-proficiency customers, customers with low- and moderate-income, K-12 students and young adults (Statewide Plan, Exh. 1, at 119). This program design will not, however, be completed until the second quarter of 2022 (Statewide Plan, Exh. 1, at 119).

The Program Administrators have also distributed Kill-a-Watt kits (devices that measure how much electricity an appliance or electronic uses) to libraries across the state, which customers can borrow to learn more about their energy usage at home (Statewide Plan, Exh. 1, at 118). The Program Administrators also plan to increase their coordination with

vocational/technical and other public high schools through the Residential Education programs as a complement to their workforce development efforts in order to offer energy efficiency career education curriculum and pathways into internships and the workforce (Statewide Plan, Exh. 1, at 26, 72).

In addition, NSTAR Electric, NSTAR Gas, and EGMA state that they intend to offer enhancements to the Residential Education programs (Statewide Plan, Exh. 1, App. G.2 - Eversource at 1).

ii. Income-Eligible Sector

The Program Administrators, in collaboration with LEAN, propose to further improve and streamline the income-eligible customer experience, increase energy savings opportunities for single and multifamily income-eligible customers, and provide customers in all building types with opportunities for cost-effective electrification[42] (Statewide Plan, Exh.1, at 111-112). The Program Administrators state that they also will coordinate with LEAN to streamline the income-eligible customer experience by adopting a more centralized and consistent intake experience (Statewide Plan, Exh. 1, at 113). This will include a new centralized LEAN single-family intake website, to be made available in Spanish, Portuguese, and English (Statewide Plan, Exh. 1, at 113).

The Program Administrators' proposed improvements for the income-eligible sector include: (1) an emphasis on heat pumps paired with weatherization and active demand

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42 The Program Administrators state that they use the terms "income-eligible customers" and "low-income customers" interchangeably (Exh. DPU-Comm 12-2).

reduction ("ADR"); (2) development of a centralized single-family intake website to complement LEAN's existing multifamily website; (3) increased multifamily opportunities, inclusive of customized deep energy retrofit approaches, incentives for common area laundry facilities, remote monitoring and building optimization, and a targeted small multifamily landlord engagement strategy; (4) an updated statewide mixed-income protocol for homes with three to four units where only one unit is income-eligible; and (5) improved remote assessments and interactions in light of COVID-19 (Statewide Plan, Exh. 1, at 111-115). The Program Administrators proposed to continue to support local Community Action Agency partners by offering fully subsidized trainings to new entrants interested in becoming income-eligible energy specialists, including heat pump technology trainings (Statewide Plan, Exh. 1, at 27-28).

iii. Commercial and Industrial Sector

The Program Administrators propose several strategies for the C&I sector, which include: (1) increasing participation of microbusinesses through the Main Streets[43] offering; (2) developing a technically proficient and diverse workforce; (3) improving participation through a focus on awareness, understanding, and accessibility of program offerings; (4) providing technical assistance and tools to increase customer and vendor knowledge in energy efficiency program guidelines; and (5) providing additional C&I optimization

[43] The Program Administrators state that the Main Streets offering reaches businesses through door-to-door efforts and provides a comprehensive approach for offering instant, on-site savings measures (Statewide Plan, Exh. 1, at 139).

measures, such as developing prescriptive weatherization and air sealing offerings, introducing low-cost tuning measures for existing equipment and controls, and developing custom express tools for repeatable low-cost C&I measures (Statewide Plan, Exh. 1, at 138-157).

The Program Administrators state that, in the C&I sector, they have identified limited awareness, understanding, and accessibility of energy efficiency opportunities as participation barriers (Statewide Plan, Exh. 1, at 144). The Program Administrators propose to overcome these organizational- and information-based barriers by simplifying all incentive application materials, reorganizing the Mass Save website with updated information, and developing additional information about the various participation pathways (Statewide Plan, Exh. 1, at 144). Additionally, the Program Administrators, together with DOER, propose to convene a working group for the purpose of obtaining input from customers, contractors, and stakeholders who have experience with the programs (Statewide Plan, Exh. 1, at 144). The Program Administrators explain that the working group will share and discuss how they have considered and incorporated that input into their program design and implementation activities (Statewide Plan, Exh. 1, at 144).

iv. Hard-to-Reach Customers

As mentioned in Section III.B.2.a, above, the Program Administrators propose to implement the Community First Partnership Program to increase the reach of energy

efficiency savings, especially among renters,[44] moderate-income customers, limited English-proficiency customers, and small businesses in environmental justice communities (Statewide Plan, Exh. 1, at 18, 21). Specifically, the Program Administrators propose the following changes to municipal and community partnership efforts: (1) prioritize service to a subset of municipalities (described below), although all municipalities and community-based organization applicants proposing to focus their work in a municipality with at least one EEA-designated environmental justice census block are eligible to apply to participate; (2) change award levels for participating municipalities from $5,000-$25,000 a year to $25,000-$60,000 total for three-years; (3) provide larger, guaranteed financial awards and provide 50 percent of the award upfront; (4) allow participants, rather than Program Administrators, to set goals; (5) use an implementation vendor to coordinate and streamline program and data tracking; and (6) provide two marketing assistance pathways, one leveraging Program Administrator-developed marketing materials and one leveraging community partner-developed marketing materials (Exhs. DPU-Comm 7-9; DPU-Comm 13-9; DPU-Comm 13-18, Att. at 7).

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[44] The Program Administrators propose to further target renters by providing a 100 percent weatherization incentive for individually-metered rental units and by developing a strategic plan to better serve renters and landlords in 2022 (Statewide Plan, Exh. 1, at 67).

The Program Administrators identified 38 communities across the Commonwealth as priorities for investment in energy efficiency ("38 Targeted Communities")[45] (Statewide Plan, Exh. 1, at 21). These 38 Targeted Communities will receive priority status in being selected as a Community First Partner (Statewide Plan, Exh. 1, at 21; Exh. DPU-Comm 13-18, Att. at 7). The Program Administrators selected the 38Targeted Communities using the following criteria: (1) greater than 33 percent of the municipality's population resides in block groups that meet the criteria for an environmental justice population as defined by EEA;[46] (2) at least one census block group in the municipality meets the state's environmental justice population income criteria and at least one additional criterion (e.g., minority or limited English-proficiency); (3) past energy efficiency program participation rate does not exceed the

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45 The 38 Targeted Communities are Attleboro, Boston, Brockton, Chelsea, Chicopee, Eastham, Everett, Fall River, Fitchburg, Gardner, Gloucester, Great Barrington, Haverhill, Holbrook, Lawrence, Lowell, Lynn, Malden, Methuen, Montague, New Bedford, North Adams, Northampton, Palmer, Peabody, Pittsfield, Quincy, Randolph, Revere, Southbridge, Springfield, Stoughton, Taunton, Wareham, Webster, West Springfield, Williamstown, and Worcester (Statewide Plan, Exh. 1, at 21). The Program Administrators state that, given the size and diversity of Boston, the following eight neighborhoods are Targeted Communities: Allston, Brighton, Dorchester, East Boston, Fenway, Mattapan, Mission Hill, and Roxbury (Statewide Plan, Exh. 1, at 21). As discussed in Section VII, below, the Program Administrators propose to receive a performance incentive for achieving benefits in these same 38 Targeted Communities (Statewide Plan, Exh. 1, at 21, 52& App. A at 28).

46 For the EEA's definition and list of environmental justice populations, see https://www.mass.gov/info-details/environmental-justice-populations-in-massachusetts.

statewide average of 32 percent;[47] (4) median household income is less than 100 percent of state median household income; and (5) the municipality is served by Program Administrators for electric and/or gas accounts (Statewide Plan, Exh. 1, at 21).

b. Strategic Electrification

The Program Administrators plan to increase their electrification efforts (i.e., encourage customers to transition away from traditional fossil-fuel based heating and cooling measures during the 2022-2024 term) (Statewide Plan, Exh. 1, at 11). The Program Administrators plan to focus on increasing the scope and scale of building retrofits, weatherization, and the efficient electrification of space and water heating with high-efficiency heat pump technologies including air source, water source, ground source (geothermal), and variable refrigerant-flow heat pumps (Statewide Plan, Exh. 1, at 11-12).

The Program Administrators propose to prioritize serving customers who are more likely to experience reduced heating costs and a seamless installation, while simultaneously working to address the technical and financial hurdles that make electrification more challenging for other customers (Statewide Plan, Exh. 1, at 12-13). Specifically, the Program Administrators will prioritize customers who currently heat with oil, propane, or electric resistance heating, as they are more likely to realize reduced heating costs from

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47 The Program Administrators define participation as the consumption-weighted location participation from the Residential Non-Participant Customer Profile Study (Exh. DPU-Comm 2-8, Att. A). The Program Administrators state that the statewide average consumption-weighted location participation rate for combined gas and electric service is 32 percent (Exh. DPU-Comm 2-14).

transitioning to a heat pump technology (Statewide Plan, Exh. 1, at 13). For customers heating with natural gas, the gas Program Administrators plan to offer an enhanced incentive, as a customer switching from natural gas to a heat pump, in almost all cases, would realize an increase in the cost to heat their home or business, in addition to the incurred capital cost for system installation (Statewide Plan, Exh. 1, at 13). For market-rate residential customers, the Program Administrators propose to offer additional monetary incentives if the customer weatherizes its home prior to heat pumps installation (Exh. DPU-Comm 11-8). For income qualified moderate-income customers,[48] the Program Administrators state they will require installation of recommended weatherization improvements as a prerequisite for accessing the enhanced moderate-income heat pump incentives (Exh. DPU-Comm 11-7). If the moderate-income customer chooses not to install the recommended weatherization measures, the customer will continue to have access to standard, market-rate heat pump incentives (Exh. DPU-Comm 11-7). Additional electrification strategies will include the introduction of an all-electric new construction pathway for residential buildings (i.e., the New Construction Path-to-Zero offering), increased technical assistance and financial support for all-electric new construction commercial buildings that minimize overall energy consumption, and continued promotion of Passive House certifications for commercial and residential new construction projects (Statewide Plan, Exh. 1, at 13). Other strategies

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[48] For the 2022-2024 Three-Year Plan, moderate-income customers are defined as households with incomes greater than 60 percent and equal to or lesser than 80 percent of the state median income (Statewide Plan, Exh. 1, at 7 n.8).

include targeted outreach to customers whose homes have already been weatherized to promote: (1) insulation and heat pump technologies; (2) induction cooktop incentives to displace fossil fuel cooking appliances; and (3) new incentives for electrification of other end uses displacing fossil fuels, such as lawn equipment, forklifts, and other small engine-driven equipment (Statewide Plan, Exh. 1, at 16).

The Program Administrators plan to develop a statewide heat pump education campaign, which includes dedicated heat pump awareness marketing and dedicated heat pump pages on the Mass Save website, and a heating comparison calculator (Statewide Plan, Exh. 1, at 75; Exh. DPU-Comm 7-3). The Program Administrators plan to establish a heat pump installer network of HVAC contractors trained on program offerings, heat pump technologies, heat pump installation, and on the importance of weatherization prior to heat pump installation (Statewide Plan, Exh. 1, at 75; Exhs. DPU-Comm 5-7; DPU-Comm 5-12; DPU-Comm 5-16; DPU-Comm 5-17; DPU-Comm 12-22). The Program Administrators will also engage vocational/technical high school and HVAC training programs by encouraging the inclusion of heat pumps and integrated controls in their training programs (Statewide Plan, Exh. 1, at 75). The Program Administrators will also design an HVAC student heat pump curriculum on the online training platform, designed to help prepare students to enter the HVAC workforce (Statewide Plan, Exh. 1, at 75). The Program Administrators state that the goal of engaging manufacturers and distributors is to generate demand for existing training and certification pathways, and drive changes in inventory stocking practices (Statewide Plan, Exh. 1, at 75). The Program Administrators also will continue to convene

industry-partner working groups to promote the exchange of ideas and information (Statewide Plan, Exh. 1, at 75).

In response to industry feedback acknowledging that most commercial customers have small, standard installations, the Program Administrators developed a small heat pump offering for C&I customers in 2020 (Statewide Plan, Exh. 1, at 152). The Program Administrators also intend to offer standardized weatherization services as enabling measures for some C&I customers who are interested in electrification (Statewide Plan, Exh. 1, at 153). The Program Administrators plan to finalize the details of their deep energy retrofit offering for C&I customers in 2022 (Statewide Plan, Exh. 1, at 153). The Program Administrators also plan to develop a GHG emissions reduction competition for C&I customers (Statewide Plan, Exh. 1, at 153).

c. Active Demand Reduction

The electric Program Administrators have included the following four new proposed ADR offerings in the Statewide Plan: (1) income-eligible direct load control;[49] (2) electric vehicle ("EV") load management; (3) C&I technology-neutral daily dispatch; and (4) solar

[49] For income-eligible customers, the electric Program Administrators propose to offer customers with home Wi-Fi connectivity the option of smart thermostats (see, e.g., Exh. NSTAR-Electric-2, at 93). The electric Program Administrators also propose to offer income-eligible customers with central cooling information about enrolling in the electric Program Administrators' ADR offerings (see, e.g., Exh. NSTAR-Electric-2, at 93).

photovoltaic ("PV") inverters[50] (see, e.g., Exh. NG-Electric-5 (Rev.)). The electric Program Administrators also propose to continue to include the following seven ADR offerings in the Statewide Plan: (1) residential direct load control;[51] (2) residential battery storage daily dispatch; (3) C&I technology-neutral targeted dispatch; (4) C&I interruptible load; (5) C&I battery storage daily dispatch; (6) C&I battery storage targeted dispatch; and (7) custom ADR (see, e.g., Exh. NG-Electric-5 (Rev.)). The electric Program Administrators anticipate that the proposed ADR offerings will result in approximately 280 megawatts ("MW") of peak demand reduction by 2024 (Statewide Plan, Exh. 1, App. C.1-Electric (Rev.), Table IV.D.3.2.i).

With respect to the daily dispatch offerings, the electric Program Administrators propose to offer a five-year incentive rate lock for certain participants (Statewide Plan, Exh. 1, at 173). Additionally, for customers or developers who seek to install eligible commercial batteries with behind-the-meter assets greater than 50 kilowatts ("kW"), upon submission of a completed interconnection application to the electric distribution company, customers or developers can request a commitment letter from the Program Administrator that allows the customer two years to enroll in the daily dispatch program for a five-year

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50 The Department addresses National Grid (electric)'s proposed solar PV inverter measure in Section IV.D.3.d, below.

51 For the residential sector, the electric Program Administrators propose to implement a direct load control offering that provides incentives to customers with eligible communications devices to allow the Program Administrators to control central air conditioning load during system peak times in response to an event signal (see, e.g., Exh. NSTAR-Electric-2, at 92).

term at the incentive rate in effect at the time the commitment letter was issued (Statewide Plan, Exh. 1, at 174).[52]

The electric Program Administrators propose to develop an unspecified statewide EV load management offering (Statewide Plan, Exh. 1, at 106). The electric Program Administrators state that they generally intend to offer incentives to customers with EVs to encourage them to charge their vehicles during certain event windows (see, e.g., Exh. NSTAR-Electric-2, at 93). In particular, NSTAR Electric and National Grid (electric) are currently conducting a self-evaluation of the EV activities they undertook during the 2019-2021 Three-Year Plan term (Statewide Plan, Exh. 1, at 106). NSTAR Electric and National Grid (electric) state that they have not yet decided which approach they will use during the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, at 106). Nonetheless, NSTAR Electric and National Grid (electric) each propose to implement an EV load management offering or offerings by summer 2022 (Statewide Plan, Exh. 1, at 106). The Compact and Unitil (electric) state that they intend to monitor the progress for potential implementation of a statewide EV measure at a later time (Statewide Plan, Exh. 1, at 106).

d. Solar Photovoltaic Inverters

During the 2019-2021 Three-Year Plan term, National Grid (electric) implemented a new offering for customers with existing inverters connected to residential solar PV

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[52] To the extent the customer enrolls in the daily dispatch offering more than two years after the issuance of the commitment letter, any time in excess of two years will be counted towards the five-year rate lock term (Statewide Plan, Exh. 1, at 174).

installations (Statewide Plan, Exh. 1, at 105).[53] National Grid (electric) states that this offering was designed to leverage the ability of solar PV inverters to provide power factor correction, helping to address feeders with excessive reactive power (Statewide Plan, Exh. 1, at 105). National Grid (electric) further states that it implemented the solar PV inverter control offering as part of its new measure development efforts (D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1).[54]

National Grid (electric) proposes to offer the solar PV inverter control offering as a measure during the Three-Year Plan term (Statewide Plan, Exh. 1, at 105). The other electric Program Administrators state they also may also offer this measure during the Three-Year Plan term (Statewide Plan, Exh. 1, at 105).

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53 National Grid (electric) states that 2,032 customers participated in the solar PV inverter control offering at a total cost of $135,016 during the 2019-2021 Three-Year Plan term (i.e., $47,125 in customer incentives, $21,630 in device enrollment and service fees, and $66,264 in performance evaluation) (D.P.U. 21-128, Exh. DPU-Electric 2-5).

54 National Grid (electric) states that the solar PV inverter control measure did not meet the requirements for a pilot or formal demonstration program because it was not designed "to provide the information required to assess a project's potential for measurable, cost-effective savings and benefits that can be scaled to be included in programs" (D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1). Rather, National Grid (electric) states that the offering was conducted as part of the new measure development efforts that it and the other Program Administrators perform "as a matter of course" during all three-year plan terms (D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1). National Grid (electric) maintains that if initial research shows that a measure implemented through new measure development efforts is "cost-effective, technically feasible, and appropriate," the Program Administrators are able to offer the measure without a separate demonstration (D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1).

National Grid (electric) states that the proposed measure is designed to achieve savings at the feeder level while also providing system benefits (Statewide Plan, Exh.1, at 173, D.P.U. 21-128, Exh. DPU-Electric 2-3). Over the Three-Year Plan term, National Grid (electric) proposes to enroll 14,322 residential customers and 165 C&I customers in the solar PV inverter control offering with a total customer incentives budget of $608,982 (D.P.U. 21-128, Exh. NG-Electric-5 (Rev.) (December 21, 2021)).

National Grid (electric) does not propose to offer any incentives for the installation of new solar PV inverters as part of this measure (D.P.U. 21-128, Exh. DPU-Electric 2-3). Instead, National Grid (electric) proposes to offer incentives to customers who permit the Program Administrator to adjust settings on existing solar PV inverters (D.P.U. 21-128, Exh. DPU-Electric 2-3). In this regard, National Grid (electric) describes the proposed solar PV inverter control measure as a "bring your own device" offering where it will provide an incentive to control an existing customer-owned and sited asset (D.P.U. 21-128, Exh. DPU-Electric 2-5). National Grid (electric) states that, in the future, it may seek to extend this measure to other customers or leverage the offering to provide grid benefits other than power factor correction (Statewide Plan, Exh. 1, at 105).

e. Lighting

The Program Administrators maintain that the remaining cost-effective savings from residential market rate lighting are limited and, therefore, they have eliminated[55] the

[55] The Program Administrators discontinued their support of the Department-approved midstream market-rate residential lighting incentives at the end of 2021

residential lighting upstream program and in-unit direct install lighting for market rate customers as of year-end 2021, and do not propose to offer these measures again in their 2022-2024 Three-Year Plans (see, e.g., Exhs. NG-Gas-2, at 87; DPU-Comm 2-4). The Program Administrators propose to continue to offer lighting to income-eligible participants through a direct install channel (i.e., Income Eligible Coordinated Delivery) (Statewide Plan, Exh. 1, at 63-64; Exh. DPU-Comm 9-1).

Additionally, the Program Administrators propose to remove claimable residential lighting savings for renters (Statewide Plan, Exh. 1, at 63-64; Exh. DPU-Comm 9-2). Although the Program Administrators do not propose to continue to offer lighting incentives to renters, they state that they are considering offering certain lighting packages to renters (Statewide Plan, Exh. 1, App. M at 6; Exh. DPU-Comm 9-2). The Program Administrators maintain, however, that in determining whether to offer lighting packages to renters, they would first need to determine whether a renter lighting offering would generate claimable savings and be cost-effective (RR-DPU-4; Exh. DPU-Comm 9-2).

3. Evaluation, Measurement, and Verification

The Program Administrators propose to continue the evaluation framework that they previously employed to support third-party EM&V efforts (Statewide Plan, Exh. 1, at 176).

(Exh. DPU-Comm 2-4). The Program Administrators state that they based this decision to suspend lighting incentives on LED market share data, based on their assessment that Massachusetts LED market share will continue to grow absent lighting incentives (Exh. DPU-Comm 2-4).

In particular, the Program Administrators propose to focus their EM&V activities on the following four research areas: (1) residential energy efficiency; (2) C&I energy efficiency; (3) demand in Residential, Income Eligible, and C&I Sectors; and (4) special and cross-cutting[56] (Statewide Plan, Exh. 1, at 178). Within each research area, the Program Administrators propose to conduct the following types of EM&V studies: (1) impact evaluations; (2) baseline studies; (3) net-to-gross studies; (4) market effects evaluations; (5) non-energy impact ("NEI") studies; (6) cost and measure life studies; (7) market characterization studies; and (8) process evaluations (Statewide Plan, Exh. 1, at 178-179). The Program Administrators propose to allocate $57,587,446 (or 1.5 percent of the total proposed budget) for statewide EM&V activities during the upcoming Three-Year Plan term (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.) at 12, C.2 Gas (Rev.) at 8). The EM&V study budget is included in the Evaluation and Market Research line item under the hard-to-measure category, along with other evaluation and market research costs, such as potential studies, the AESC Study, maintenance of the Technical Reference Manual ("TRM"), internal staff labor, non-study consultant costs, and Program Administrator market research efforts (Statewide Plan, Exh. 1, at 179 & Apps. C.1 – Electric (Rev.) at 12, C.2 – Gas (Rev.) at 8).

The Program Administrators state their proposed EM&V evaluation efforts support electrification by quantifying and documenting the conditions under which heat pumps will

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[56] The Program Administrators state that certain studies may be cross-sector (i.e., study both the residential and C&I sectors) (Statewide Plan, Exh. 1, at 180).

benefit customers and save energy, while addressing barriers to heat pump adoption and making progress toward HVAC market transformation to favor heat pump adoption (Statewide Plan, Exh. 1, App. H at 4).

The Program Administrators state that EM&V will provide research to support increased participation among key demographic groups that have historically low participation rates, such as renters, moderate-income customers, and limited English-proficiency customers (Statewide Plan, Exh. 1, App. H at 4). Additionally, the Program Administrators plan to implement a workforce development program with a focus on introducing new skills to the existing workforce and bringing underrepresented groups into the field (Statewide Plan, Exh. 1, App. H at 4). Through EM&V research, the Program Administrators state that they will identify indicators of workforce development success, track progress, and clarify program theory (Statewide Plan, Exh. 1, App. H at 4).

The Program Administrators state that they have established an Evaluation Management Committee that serves as a steering committee for statewide evaluation issues, providing guidance and direction to each of the evaluation research areas, and assisting in setting research priorities (Statewide Plan, Exh. 1, at 177). Finally, the Program Administrators state that, together with the Evaluation Management Committee, they have developed a strategic evaluation plan that will serve as a long-term planning document to guide evaluation activities in the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, App. H at 4).

C. Positions of the Parties

1. Program Administrators

The Program Administrators claim that, consistent with G.L. c. 25, § 21(b)(1), the Three-Year Plan includes savings goals that are designed to achieve all available cost-effective energy efficiency and demand reduction measures for the three-year period beginning January 1, 2022, and that the Three-Year Plan is constructed to attain GHG emissions reduction targets set by the EEA Secretary (Program Administrators Brief at 14, 16-17). The Program Administrators argue that the Three-Year Plan includes aggressive statewide energy savings and GHG reduction goals, even as energy efficiency markets are becoming saturated and baselines for claimable savings increase (Program Administrators Brief at 16, citing Statewide Plan, Exh. 1, at 8 & App. N).

The Program Administrators argue that the Three-Year Plans are designed to meet or exceed the GHG emissions reduction goals set by the EEA Secretary pursuant to the Climate Act (Program Administrators Brief at 14). In this regard, the Program Administrators maintain that, together, the Three-Year Plans are designed to meet the EEA Secretary's overall goal to reduce CO_2e emissions by 845,000 metric tons by 2030 (Program Administrators Brief at 10). Moreover, the Program Administrators maintain that the Three-Year Plans include a detailed description of the design of each program that acts as a roadmap for the attainment of the requisite GHG emissions reductions (Program Administrators Brief at 11, citing Statewide Plan, Exh. 1, App. A at 8-9).

The Program Administrators maintain that they engaged in a collaborative planning process for setting the savings goals and budgets contained in the Statewide Plan (Statewide Plan, Exh. 1, App. A at 7). In addition, the Program Administrators assert that development of the Statewide Plan involved discussions between the Program Administrators, the Council, DOER, the Attorney General, LEAN, contractors, consultants, and other stakeholders regarding program savings and GHG emissions reduction goals, budgets, and key priorities (Statewide Plan, Exh. 1, at 8 & App. A at 14, 46-47).

The Program Administrators argue that it is critical to increase the pace with which heat pumps are installed in customers' homes and businesses in order to achieve the widescale transition of heating systems away from fossil fuels (Program Administrators Brief at 17). The Program Administrators claim that by engaging the electrification market through all market actors (i.e., manufacturers, distributors, contractors, and customers) and through several channels, such as offering enhanced incentives, training, education, and marketing, the goal of whole market transformation can be realized (Program Administrators Brief at 17-18).

According to the Program Administrators, educating customers about how electrification measures affect their comfort, economic interests, and the environmental impacts of their energy consumption choices, is critical to the long-term success of their market transformation efforts (Program Administrators Brief at 18). To that end, the Program Administrators state that they are developing a public-facing heating comparison calculator that will allow customers to compare costs (both installation and operating), energy

savings, and GHG emissions reductions resulting from the installation of high efficiency heating systems, including heat pumps (Program Administrators Brief at 18). The Program Administrators assert that they plan to create a pathway for customers to have targeted discussions with HVAC specialists about the various savings scenarios that exist depending on the customer's existing heating system and heating fuel, the role of integrated controls, potential energy cost savings when fuel switching, heat pump system types and design, and about the capabilities and efficiencies of different equipment (Program Administrators Brief at 18).

To ensure that electrification offerings do not negatively affect income-eligible customers' economic interests, the Program Administrators assert that they will work with LEAN to offer electrification measures to income-eligible customers only where the economics are positive (Program Administrators Brief at 19, citing Exh. DPU-Comm 3-6). The Program Administrators claim that they will encourage weatherization prior to the installation of heat pumps by providing customers with information about the benefits of both, so they can make the best choice for themselves (Program Administrators Brief at 19). The Program Administrators also claim they will include a disclosure on residential customer facing materials regarding potential economic impacts (addressing total energy spending as well as utility bill impacts in isolation) associated with electrification (Program Administrators Brief at 20, citing Exhs. DPU-Comm 3-6; DPU-Comm 5-11; DPU-Comm 11-7; DPU-Comm 11-8).

The electric Program Administrators maintain that the proposed C&I and residential (including income-eligible) ADR offerings are cost-effective (Program Administrators Brief at 30). Responding to Sunrun's concerns about process-related issues, the Program Administrators assert that they work closely with participating stakeholders and strive to provide clear, understandable programs (Program Administrators Reply Brief at 18, citing Sunrun Brief at 3-8). To that end, the electric Program Administrators propose to hold an annual meeting to provide an overview of ADR programs and coordinate at least one public session per year to solicit feedback on their ADR offerings (Program Administrators Reply Brief at 18, citing Sunrun-Comm 1-4). The electric Program Administrators note that they will continue to make minor changes and clarifying updates to their ADR offerings, on an as-needed basis, as a result of stakeholder feedback and/or third-party evaluation recommendations (Program Administrators Reply Brief at 18, citing Sunrun-Comm 1-4).

The Program Administrators argue that broad residential lighting offerings are no longer a cost-effective way to generate savings (Program Administrators Brief at 35). The Program Administrators claim that consumers are increasingly adopting LEDs on their own, without incentives, because they have become familiar with LEDs and the value they provide (Program Administrators Brief at 34). Further, the Program Administrators contend that lighting suppliers expect LEDs will continue to experience growth in market share, even without program incentives (Program Administrators Brief at 35).

The Program Administrators maintain that the rapid market change in LED adoption limits the effective measure lives for direct-install programs (Program Administrators Brief

at 34). The Program Administrators contend that there is a high and growing market share of LEDs and when an existing bulb fails, it will be replaced by an LED bulb absent program intervention (Program Administrators Brief at 34, citing Exh. DPU-Comm 2-4). Therefore, the Program Administrators argue that there is insufficient value in offering direct install lighting measures given it would only slightly accelerate the adoption of LEDs (Program Administrators Brief at 34).

The Program Administrators maintain that, in addition to eliminating residential market rate lighting measures, they have also removed some incentives for heating equipment, including propane, and gas-fired heating measures with condensing baselines and oil boilers, as these measures no longer provide significant savings (Program Administrators Brief at 35-37; Program Administrators Reply Brief at 8-9). The Program Administrators argue that the savings from residential propane and gas condensing heating measures are now very small because the baseline is already efficient and, therefore, do not require program intervention (Program Administrators Brief at 36). Further, the Program Administrators contend that it is unclear what an appropriate incentive level for these measures would be, given that incremental costs range from $31.00 to $1,034.00 (Program Administrators Brief at 37, citing Exh. DPU-Comm 10-12). The Program Administrators argue that, based on this range, an incentive may not even be necessary for a customer to replace their heating system (Program Administrators Brief at 37, citing Tr. 1 at 80; Exh. DPU-Comm 13-11). According to the Program Administrators, a higher incentive may be an imprudent use of

ratepayer-provided energy efficiency funds (Program Administrators Brief at 37, citing Exh. DPU-Comm 10-12).

The Program Administrators argue that the program-efficiency level for oil boilers is the same as the code requirement; resulting in removal of oil boilers from the program entirely, given there are no claimable savings or opportunities for program intervention (Program Administrators Brief at 35-36, citing Exh. DPU-Comm 10-12). In response to MEMA's argument that existing Mass Save rebates for efficient heating oil equipment that use low-carbon biofuels should be preserved, the Program Administrators argue that the use of biofuels, on its own, does not lead to a reduction in customer energy consumption or demand and would, therefore, not qualify as an energy efficiency measure (Program Administrators Reply Brief at 8-9, citing Tr. 1, at 77). Therefore, the Program Administrators recommend the Department approve their proposal to remove this incentive from the Three-Year Plans (Program Administrators Reply Brief at 9).

In response to NEGPA's concerns that the spreadsheet provided by the Program Administrators in Exh. DPU-Comm 10-3, Att. does not include ground source heat pump measures for the residential new construction, multifamily, and income-eligible sectors, or that fully displace gas furnaces, or certain C&I measures, the Program Administrators confirm that prescriptive and custom ground source heat pump measures are included in the residential and income-eligible sectors (Program Administrator Reply Brief at 9-10). The Program Administrators maintain that the spreadsheet shows residential prescriptive measures as individual line items with distinct measure lives (including ground source heat pumps fully

displacing gas furnaces), but does not show the residential new construction, multifamily and income-eligible measures individually because they have historically been treated as custom measures and, therefore, are not shown as separate line items (Program Administrator Reply Brief at 10).

The Program Administrators assert that, going forward, they will continue to offer ground source heat pumps as a custom measure but are also in the process of adding prescriptive C&I ground source heat pump offerings separate from custom C&I projects (Program Administrators Reply Brief at 10). The Program Administrators argue that it is more appropriate to apply a 25-year measure life to prescriptive C&I ground source heat pump offerings rather than the 30-year measure life recommended by NEGPA[57] (Program Administrators Reply Brief at 10-11). The Program Administrators contend that custom measures will continue to have custom measure lives (Program Administrators Reply Brief at 11). Additionally, the Program Administrators agree with NEGPA that ground source heat pump measures should not have a baseline, except in circumstance of upgrade or replacement of an existing ground source heat pump installation (Program Administrators Reply Brief at 10-11).

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[57] The Program Administrators argue that a 25-year measure life is consistent with the recent Ground Source Heat Pump TRM Measure Review, which incorporates the DOE Office of Energy Efficiency & Renewable Energy's expected lifetime of 25 years for the indoor portion of the ground source heat pump (Program Administrators Reply Brief at 10-11). The Program Administrators further state that they will continue to apply a 30-year measure life to residential prescriptive ground source heat pump measures, because the study only focused on C&I (Program Administrators Reply Brief at 11, citing Exh. DPU-Comm 10-3(Att.)).

Lastly, in response to CLF's recommendations relating to the implementation of "equity initiatives,"[58] including expanding data collection and reporting, the Program Administrators argue that these recommendations are beyond the equity initiative envisioned by the Statewide Plan, and are time consuming and duplicative of much of the data or information already provided by the Program Administrators (Program Administrators Reply Brief at 12-18). Further, the Program Administrators argue that CLF's proposed expansion of data collection does not strike an appropriate balance between the value and usefulness of the data requested with the cost to provide the data (Program Administrators Reply Brief at 13-14, citing Statewide Plan, Exh. 1, at 21). The Program Administrators further maintain that CLF's concerns about customer displacement stemming from program implementation would be better suited for other groups or government agencies that focus on housing or tenant rights (Program Administrators Reply Brief at 17).

2. Attorney General

The Attorney General confirms that she reached an agreement with the Program Administrators on the key terms of the Statewide Plan and recommends that the Department approve the Three-Year Plans as filed (Attorney General Brief at 14). The Attorney General supports the Program Administrators' proposal to reallocate approximately 30,000 metric tons of CO_2e from the gas Program Administrators to electric Program Administrators for

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[58] The term "equity initiative" or "equity measure" is not defined or used in the Statewide Plan (see Exh. DPU-Comm 3-1). There is a reference to "equity initiatives" in a note to Figure 1-4; however, there is no explanation of what qualifies as an "equity initiative" (see Statewide Plan, Exh. 1, at 23).

fuel switching projects (Attorney General Brief at 10-11). The Attorney General asserts that her support for this proposal is conditioned on an expressed commitment that no other savings from other efficient natural gas equipment are counted towards the achievement of the electric Program Administrators' goal (Attorney General Brief at 11).

The Attorney General expresses that equity, climate goals, and workforce development are prioritized appropriately in the Statewide Plan, which strikes an appropriate balance in accommodating cost-effective energy savings investments, achievement of GHG emissions requirements, and customer rate impacts (Attorney General Brief at 12-14, 18-20).

The Attorney General argues that in order for the Statewide Plan to meet Climate Act requirements, ambitious electrification goals are required (Attorney General Brief at 14). The Attorney General claims that the Program Administrators' portfolio of electrification measures will lower customer costs over the lifetime of the installation (Attorney General Brief at 14). The Attorney General explains that electrification of the heating sector has been identified as a preferred pathway to reduce fossil fuel heating (Attorney General Brief at 15). The Attorney General recommends that the Department approve the Program Administrators' proposed electrification programs without modification (Attorney General Brief at 15).

3. Department of Energy Resources

DOER maintains that the Statewide Plan complies with the Green Community Act's mandate to capture all cost-effective energy efficiency and demand reduction resources and minimizes bill impacts on customers (DOER Brief at 21-23). DOER also argues that the Statewide Plan complies with the Climate Act and the EEA Secretary's overall GHG

emissions reduction goal (DOER Brief at 11). DOER further asserts that the Program Administrators appropriately applied established measure lives and emissions factors to account for the Statewide Plan's contribution to meeting the 2030 limits (DOER Brief at 12). DOER maintains so long as each Program Administrator's Three-Year Plan is consistent with the Statewide Plan, the Program Administrator will be able to meet the GHG emissions reduction goals (DOER Brief at 11).

DOER supports the Program Administrators' electrification proposals, including incentives for customers fuel-switching from fossil fuels to cold-air heat pumps (DOER Brief at 23). DOER argues that the Program Administrators' electrification approach is aligned with the Commonwealth's long-term climate and energy policy goals by generating clean electricity while lowering emissions and costs (DOER Brief at 24). DOER claims that the Program Administrators' approach to increase electrification, expand eligible measures to include gas-to-electric fuel-switching, enhance incentives for all-electric new construction, and invest in workforce development and market transformation is necessary to help meet the 2030 GHG emissions reduction goals (DOER Brief at 24).

In response to Sunrun's concerns regarding mid-cycle changes to ADR offerings, DOER argues that the Council is the appropriate venue for stakeholders to raise such concerns and provide feedback on program changes that do not trigger mid-term modifications (DOER Reply Brief at 9-10, citing Sunrun Brief at 3). DOER maintains that the Council's stakeholder process enables feedback on program successes, program challenges, and proposed program changes (DOER Reply Brief at 9-10).

DOER supports the Program Administrators' proposal to eliminate the residential lighting upstream program and in-unit direct install lighting for market rate customers, further stating that the Program Administrators' reduced investments in lighting reflects the priorities of DOER (DOER Brief at 7, 11). DOER contends that lighting incentives are mature measures that no longer provide net savings (DOER Brief at 7). In addition, DOER asserts that widespread adoption of LEDs has reduced measure lives and claimable program savings (DOER Brief at 13). DOER argues that the elimination of the lighting measures will allow the Program Administrators to focus energy efficiency funding on long-term measures that will have a greater effect on the Commonwealth's emissions reduction goals and using ratepayer funds to support lighting measures is no longer appropriate (DOER Brief at 13). For these reasons, DOER argues that the Program Administrators' proposed discontinuance of lighting incentives is appropriately aligned with the Statewide Plan priorities as well as the Commonwealth's climate and environmental justice goals (DOER Brief at 7, citing Climate Act).

DOER argues that the Department should not adopt NECEC's proposal to restore language from Section 3.8.6 of the October 6th draft Statewide Plan or otherwise mandate the Program Administrators' pursuit of renewable natural gas combined heat and power ("CHP") energy efficiency measures in the Three-Year Plans (DOER Reply Brief at 8-9). DOER asserts that Section 3.8.6 of the October 6th draft Statewide Plan did not include appropriate requirements for a minimum blend of renewable natural gas or provisions related to customer

commitments for the duration of time that the project would be required to use renewable natural gas (DOER Reply Brief at 9).

Further, DOER maintains that renewable natural gas CHP energy efficiency projects for the upcoming Three-Year Term are addressed in the Term Sheet, which provides that "any additional applications for CHP will only be established consistent with Commonwealth policies and if parameters are agreed upon in advance by DOER" (DOER Reply Brief at 8, citing Statewide Plan, Exh. 1, App. M § IV.C.2). DOER argues that this language in the Term Sheet provides the flexibility sought by NECEC because it contains a mechanism for the Program Administrators, DOER, and the Council to collaboratively establish appropriate parameters for renewable natural gas CHP projects (DOER Reply Brief at 8).

4. Acadia Center

Acadia argues that the Department should approve the Statewide Plan as filed because it is consistent with the requirements of the Green Communities Act and is constructed to meet or exceed overall GHG reduction goals with cost-effective programs (Acadia Brief at 7-14). Acadia maintains that, while the GHG emissions reductions from the electric sector fall short of the goals established by the EEA Secretary, the achievement of overall GHG emissions reduction is paramount (Acadia Brief at 13). In this regard, Acadia asserts that the Three-Year Plans will meet the combined GHG emissions reduction goal due to estimated performance in the gas sector (Acadia Brief at 13).

Acadia opines that the electrification of gas customers is allowed under the amended Green Communities Act and does not result in cross-funding between programs (Acadia Brief

at 14). Acadia explains that because fuel switching measures significantly reduce total gas energy usage and deliver benefits to both gas customers and the gas system, the offerings to electrify gas-fueled buildings are appropriate and consistent with how the Program Administrators claim and pay for savings for all other measures in their portfolios (Acadia Brief at 14, citing Exh. DPU-Comm 5-15). Acadia acknowledges that some electrification measures are projected to be non-cost effective (i.e., with BCR under 1.00) but notes that all program offerings are cost-effective at the core initiative level (Acadia Brief at 14). Acadia argues that the electrification measures that are not cost-effective are necessary to build the market for widespread electrification adoption (Acadia Brief at 14-15). Acadia argues that these measures serve the same function as heat pumps, which the Department approved in the 2019-2021 Three-Year Plans as CHP measures (Acadia Brief at 16).

Acadia disputes MEMA's arguments relating to biofuels, oil-fired heating rebates, and the policy goals of the Statewide Plan (Acadia Reply Brief at 2-7). Acadia disagrees with MEMA's assertion that biofuels are inherently a low-carbon fuel and argues biofuels can have different feedstocks, extraction methods, and GHG emissions profiles (Acadia Reply Brief at 2-3, citing MEMA Brief at 4; Tr. 2, at 314). Acadia contends that biofuels are not an energy efficiency measure and the Program Administrators properly excluded them from the Three-Year Plans (Acadia Reply Brief at 2-3). Acadia asserts that, by statute, the energy efficiency measures included in the Three-Year Plans must focus on a reduction of electric or natural gas demand or consumption (Acadia Reply Brief at 2). Acadia further argues that, despite MEMA's arguments to the contrary, the oil-fired heating equipment rebates were

properly discontinued due to high cost, price volatility, and policy goals associated with the reduction of fossil fuels (Acadia Reply Brief at 3-4). Finally, Acadia argues that the Program Administrators and the Council explicitly made a policy decision to support electrification rather than low-carbon biofuels in the Statewide Plan (Acadia Reply Brief at 4-5).

5. Conservation Law Foundation

CLF supports the Three-Year Plans, as proposed, and requests the Department approve them in full (CLF Brief at 6, 53). CLF argues that, with the Program Administrators' proposed termination of residential lighting incentives, the remaining measures within a renter's control will only have a modest effect on utility bills (CLF Brief at 25, citing Statewide Plan, Exh. 1, at 63-64). Therefore, CLF argues that the Program Administrators should continue to offer lighting measures to renters and moderate-income customers; however, such measures should not count towards satisfying the equity component of the proposed performance incentive mechanism (CLF Brief at 25-26, citing Statewide Plan, Exh. 1, App. M at 6). CLF argues that this proposal will help hold the Program Administrators accountable for improving outreach to underserved individuals (CLF Brief at 25-26, citing Statewide Plan, Exh. 1, App. M at 6).

CLF recommends several metrics and implementation steps that the Program Administrators could take to increase participation while minimizing risks of displacement and gentrification (CLF Brief at 29-43). These recommendations include: (1) making program information available through additional marketing mediums such as print, radio,

television, and door-to-door canvassing; (2) expanding the Mass Save website to be a one-stop shop for energy efficiency information for renters and landlords; and (3) identifying additional factors that influence the participation of renters, low-income, and limited English-proficiency customers (CLF Brief at 21, 29, 35). CLF also recommends that the Program Administrators expand their data collection and reporting to include race, income, language spoken at home, and other demographic data on participation in energy efficiency programs to evaluate program performance and ensure that equity-related goals are met (CLF Brief at 22-23, citing Exh. CLF-PC-5 (Rev.), at 81).

CLF expresses concerns about the potential ramifications of energy efficiency upgrades for renters, which may affect such factors as the amenities available to customers, the building's property value, and the landlord's determination of rent charges (CLF Brief at 30, citing Exh. CLF-LS-5, at 88). CLF requests that the Program Administrators work with advocates during program implementation to expand energy efficiency access for renters and landlords while minimizing risks of displacement and gentrification (CLF Brief at 30). CLF also requests that the Program Administrators (1) further develop their participation goals by building size and plans for serving C&I rental properties and (2) devote 25 percent of their marketing budgets to community initiatives (CLF Brief at 36, 43). Finally, CLF argues that all Program Administrators should (1) customize their outreach to landlords and communicate through one point of contact during the weatherization process and (2) explain to landlords and renters how any new equipment works (CLF Brief at 36, citing Exh. CLF-PC (Rev.) at 4).

CLF supports the Program Administrators' push to electrify fossil fuel appliances and argues that reducing heating costs and maintaining comfort will be important for environmental justice communities (CLF Brief at 51, citing Statewide Plan, Exh. 1, at 12). CLF argues that the Program Administrators' electrification plan aligns with the Climate Act (CLF Brief at 51-52). Lastly, CLF argues that increasing electrification will reduce expenses for customers (CLF Brief at 52).

CLF argues that MEMA's contentions regarding the adverse effects of the costs associated with heat pumps on low-income households and customers living in environmental justice communities are unfounded, and that the Three-Year Plans incorporate a holistic approach to overcoming the technical and financial barriers of electrification (CLF Reply Brief at 2-3, citing MEMA Brief, at 7-9). CLF argues that the EEA Secretary has stated a clear policy need to ramp up electrification and transition away from fossil fuels (CLF Reply Brief at 3-4, citing Statewide Plan, Exh. 1, App. D at 4).

6. Low-Income Energy Affordability Network

LEAN asserts that the Statewide Plan provides structure for continuing energy efficiency collaboration, innovation, and leadership, while contributing to aggressive GHG emissions reductions and meeting the legislative goals of equity and affordability (LEAN Brief at 3). Accordingly, LEAN argues that the Department should approve the Program Administrators Three-Year Plans as submitted (LEAN Brief at 3, LEAN Reply Brief at 5). LEAN, however, proposes to clarify the Program Administrators' statements on brief pertaining to elimination of lighting and fossil-fuel heating system measures for

income-eligible participants (LEAN Reply Brief at 2-4, citing Program Administrators Brief at 34-36). Specifically, LEAN claims that although these offerings were removed for other customers, the 2022-2024 Three-Year Plans provide exceptions with respect to low- and moderate-income lighting measures, and low-income fossil fuel heating measures (LEAN Reply Brief at 2-4, citing Statewide Plan, Exh. 1, at 79, 109, App. M at 6, 7; Exhs. DPU-Comm 13-10; DPU-Comm 13-13). LEAN explains that the intent is to limit and reduce these measure offerings for low-income participants over time, not eliminate them outright (LEAN Reply Brief at 2-4).

7. Northeast Clean Energy Council

NECEC supports the Statewide Plan and argues it is designed to meet the EEA Secretary's overall GHG emissions reduction goals (NECEC Brief at 12). NECEC asserts that the Three-Year Plans encompass all cost-effective energy efficiency and demand reduction resources, strive for greater participation in underserved communities, and appropriately promote equity (NECEC Brief at 14-19). NECEC asserts that the Program Administrators' proposed strategic electrification measures are eligible energy efficiency measures under the Green Communities Act, as amended by the Legislature in 2018 (NECEC Brief at 23). NECEC further argues that neither the Green Communities Act nor the Department's Guidelines specifically require individual customer reduction in energy usage in order for inclusion in a three-year plan (NECEC Brief at 26).

NECEC supports the inclusion of the ConnectedSolutions ADR program in the Three-Year Plans, with a few proposed adjustments (NECEC Brief at 20-22). Specifically,

NECEC argues that additional oversight should be required for proposed changes to ConnectedSolutions. In addition, NECEC argues that, the Program Administrators should be required to implement a more transparent change process, including at least two annual meetings with stakeholders (NCEC Brief at 20-22).

NECEC argues that the Department should direct the Program Administrators to: (1) restore language from Section 3.8.6 of the October 6th draft Statewide Plan allowing the Program Administrators to pursue renewable natural gas CHP energy efficiency measures during the upcoming Three-Year Plan term; or (2) otherwise find that projects using Renewable Energy Portfolio Standard ("RPS") Class I-eligible fuels (i.e., renewable natural gas) should be offered under the Three-Year Plans as energy efficiency measures (NECEC Brief at 33-34).[59] NECEC asserts that the October 6th draft Statewide Plan appropriately recognized that: (1) biogas and landfill gas are considered zero emissions fuels; (2) CHP energy efficiency measures would follow the RPS regulations to determine renewable gas eligibility; and (3) customers would be required to demonstrate that their project is cost effective, does not contribute to 2030 GHG emissions, and delivers either MMBtu or electric demand savings (NECEC Brief at 32-33).

NECEC argues that restoration of the language from Section 3.8.6 of the October 6th draft Statewide Plan would provide the Program Administrators with additional flexibility to

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[59] The Massachusetts RPS requires retail electricity suppliers (both regulated distribution utilities and competitive suppliers) to obtain a percentage of the electricity for their customers from qualifying renewable energy facilities. 225 CMR 14.07.

encourage the use of RPS-eligible fuels for CHP facilities and exclusion of such fuels from efficiency measures during the upcoming Three-Year Plan term has created market uncertainty (NECEC Brief at 33). NECEC asserts that allowing the Program Administrators to pursue renewable natural gas CHP energy efficiency measures during the upcoming Three-Year Plan term will ensure that emissions-reducing resilience options will be available (NECEC Brief at 33). Without a RPS-compliant option, NECEC argues that facilities requiring resilient on-site power likely will select diesel back-up generators (with high GHG emissions and local pollutant profiles) instead of renewable natural gas (NECEC Brief at 33).

8. New England Geothermal Professional Association

NEGPA supports the Three-Year Plans and recommends Department approval (NEGPA Brief at 4). NEGPA asserts, however, that the Statewide Plan inappropriately omits several measures that cause it to misrepresent the cost-effectiveness of ground source heat pumps, the role of ground source heat pumps in achieving net zero GHG emissions by 2050, and the contribution of ground source heat pumps on mitigating peak summer and winter electric demand (NEGPA Brief at 2). NEGPA maintains that the Statewide Plan does not include ground source heat pump measures for residential new construction, multifamily and income-eligible offerings, nor for fully displacing gas furnaces (NEGPA Brief at 3, citing Statewide Plan, Exh. 1, App. O at 152 n.4; Exh. DPU-Comm 10-3, Att.). NEGPA argues that the Program Administrators should: (1) change measure life for each ground source heat pump measure to 30 years and the baseline comparison to an existing fuel for retrofits or a reasonably available fuel for new construction; and (2) ensure that ground source heat pump

measures only have a ground source heat pump baseline in the case of an upgrade or replacement to an existing ground source heat pump installation (NEGPA Brief at 4).

9. Massachusetts Energy Marketers Association

MEMA argues that the Department should direct the Program Administrators to modify the Three-Year Plans to preserve existing Mass Save rebates for efficient heating oil equipment (MEMA Brief at 1, 8). MEMA asserts that the goals for partial replacement heat pumps agreed to in the Term Sheet set a minimum number of fossil-fueled heating systems that will continue to play a role in residential heating during the winter and, therefore, oil boiler replacements will provide substantial savings and should remain eligible for incentives (MEMA Brief at 2-3; MEMA Reply Brief at 2-3). Second, MEMA urges the Department to consider opportunities for immediate GHG emissions reductions with biofuels and other low carbon fuels, while recognizing the higher costs of heat pumps and marginal grid emissions impacts, rather than an average grid emissions profile (MEMA Brief at 3-5; MEMA Reply Brief at 3-5). Lastly, MEMA argues that overreliance on heat pumps and higher electricity usage may be particularly harmful to low-income customers and customers living in environmental justice communities and, therefore, preserving rebates for efficient fossil-fuel heating equipment could immediately reduce GHG emissions and grid demand over the next three years (MEMA Brief at 4, 7-9; MEMA Reply Brief at 7-8).

10. Sunrun

Sunrun supports the electric Program Administrators' proposed ADR programs (Sunrun Brief at 3). Sunrun maintains that the ADR measures implemented by the electric

Program Administrators in the 2019-2021 Three-Year Plans and proposed in the 2022-2024 Three-Year Plans, are critical building blocks to unlocking customer-sited distributed energy and other clean energy resources that provide grid and ratepayer benefits (Sunrun Brief at 10-11).

Sunrun raises concerns with the following program implementation process issues: (1) changes to program implementation mid-program cycle; (2) difficulty qualifying of eligible devices; and (3) lack of stakeholder involvement when transitioning demonstration projects to core initiatives or programs (Sunrun Brief at 3). In this regard, Sunrun argues that process improvements to facilitate meaningful stakeholder engagement are needed to maximize ADR program benefits (Sunrun Brief at 10-11). Specifically, Sunrun argues that it is necessary to simplify what are currently complex equipment enrollment procedures and implement a process to solicit meaningful stakeholder input on proposed mid-cycle changes to ADR programs (Sunrun Brief at 10-11).

Sunrun states that it supports the concept of a solar PV inverter offering as presented in National Grid (electric)'s Three-Year Plan (Sunrun Brief at 9). Sunrun raises concern, however, with the lack of detail National Grid (electric) provided about the proposed offering, given that it intends to transition the offering from a "demonstration program" to a full measure in 2022 (Sunrun Brief at 9). In particular, Sunrun argues that National Grid (electric) provided limited detail on the implementation of the solar PV inverter demonstration offering during the 2019-2021 Three-Year Plan term, much less a framework for stakeholder input on (1) refining the demonstration program for implementation as a

statewide measure or (2) addressing potential modifications that may be needed in subsequent program years (Sunrun Brief at 9). To correct these issues, Sunrun argues that National Grid (electric) should be required to file the following information before it is allowed to implement the proposed solar PV inverter measure: (1) proposed incentive values and program structure; (2) eligibility criteria; (3) terms and conditions for participation, including interaction with other programs; and (4) proposed framework for stakeholder engagement (Sunrun Brief at 9).

D. Analysis and Findings

1. Introduction

Energy savings represent the electricity, natural gas, heating oil, propane, and other resources saved as a result of the deployment of energy efficiency. The Department considers energy savings in order to evaluate the degree to which the proposed Three-Year Plans achieve their mandate of planning to achieve all cost-effective energy and demand resources. In addition, the Department must determine if the Three-Year Plans are constructed to meet or exceed the GHG emissions reduction goals set by the EEA Secretary pursuant to G.L. c. 21N, § 3B. When reviewing individual savings goals, the Department must ensure that each Program Administrator has taken appropriate steps to demonstrate that its Three-Year Plan: (1) establishes a sustainable effort in its continued delivery of energy efficiency; (2) has considered new technologies and enhancements; (3) has sought to design programs to address identified barriers; and (4) has included the results of avoided costs, potential and EM&V studies. 2019-2021 Three-Year Plans Order, at 10-11;

2016-2018 Three-Year Plans Order, at 25-27; 2013-2015 Three-Year Plans Order, at 37-40. In addition, the Department considers whether the proposed programs prioritize safety, reliability, security, affordability, equity, and the GHG limits established pursuant to G.L. c. 21N. G.L. c. 25, § 1A. These issues are relevant to the Department's ultimate determination of whether the Three-Year Plans will provide for the acquisition of all available cost-effective energy efficiency and demand reduction resources. See G.L. c. 25, §§ 19(a), 19(b), 21(b)(1).

The Energy Act of 2018 amended the Green Communities Act to expand the scope of energy efficiency programs that are eligible for inclusion in the Three-Year Plans. Energy Act of 2018, at § 2. In pursuit of the achievement of all cost-effective energy efficiency and demand reduction resources, the Program Administrators include programs that provide energy and demand savings through strategic electrification that result in cost-effective reductions in GHG emissions and minimize ratepayer costs. G.L. c. 25, § 21(b)(2)(iv)(A). The Department maintains that strategic electrification must be a balanced part of the Program Administrators' overall approach in planning to achieve all cost-effective savings. 2019-2021 Three-Year Plans Order, at 155.

2. Plan Goals

The Statewide Plan contains aggregate savings and GHG emissions reduction goals, as well as individual savings and GHG emissions reduction goals for each electric and gas Program Administrator (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.), C.2 – Gas (Rev.)). These goals were developed through a collaborative process that culminated with

the Council's approval of the Statewide Plan as (1) meeting the Green Communities Act's requirement to achieve all available, cost-effective energy efficiency and (2) supporting of the EEA Secretary's GHG emissions reduction goals pursuant to G.L. c. 21N, § 3B (Statewide Plan, Exh. 1, at 8-9 & Apps. A at 7-14, N).

After review, the Department finds that the statewide and individual Program Administrator savings goals developed through this process appropriately take into consideration potential studies, program sustainability, and territory-specific savings drivers (Statewide Plan, Exh. 1, App. A, at 7-14 & App. F; Exhs. BGC-2, at 29-22, 24-30; EGMA-2, at 20-22, 24-31; FGE-Gas-2, at 18-21, 23-30; LU-2, at 18-21, 23-29; NG-Gas-2, at 21-32; NSTAR-Gas-2, at 20-22, 24-31; Compact-2, at 19-21, 23-30; FGE-Electric-2, at 18-21, 23-39; NG-Electric-2, at 21-31; NSTAR-Electric-2, at 20-22, 24-31). Additionally, the Department finds that the net lifetime all fuel savings metric was appropriately calculated by converting all fuel savings to MMBtu and accounts for embedded energy with heat values from a mix of fuels when converting electric savings. Guidelines § 3.4.7.2. Further, the Department finds that the aggregate and individual gas and electric savings goals will be, with the required modifications for heating systems and lighting addressed below, consistent with the achievement of all available cost-effective energy efficiency (Statewide Plan, Exh. 1, at 144-151).

In addition, each Three-Year Plan must be designed to meet the GHG emissions reduction goals set by the EEA Secretary pursuant to G.L. c. 21N, § 3B. St. 2021, c. 8, §§ 26A, 28; D.P.U. 20-150-A at 7, 50; Guidelines § 3.4.7. As described above, the EEA

Secretary established an overall goal to reduce CO_2e emissions by 845,000 metric tons by 2030, with 504,000 metric tons allocated to the electric Program Administrators and 341,000 metric tons allocated to the gas Program Administrators (Statewide Plan, Exh. 1, Apps. C.1-Electric (Rev.) at 30; D at 3, C.2-Gas (Rev.) at 25, D at 3).

The Statewide Plan is designed to achieve a total of 848,713 metric tons of CO_2e emissions reduction in 2030, directly associated with the energy efficiency measures implemented in 2022–2024, with 374,195 metric tons of CO_2e emissions reduction in 2030 from the gas Program Administrators and 474,518 metric tons of CO_2e emissions reduction in 2030 from the electric Program Administrators (Statewide Plan, Exh. 1, Apps. C.1 - Electric (Rev.), Table IV.D.3.2.i, C.2 - Gas (Rev.), Table IV.D.3.2.i).

As filed, the electric Program Administrators' Three-Year Plans fall short of the electric sector goal set by the EEA Secretary (Statewide Plan, Exh. 1, Apps. D, M at 2-3; see, e.g., Exh. NSTAR Gas-2, at 37). To address this shortfall, the Program Administrators propose to transfer approximately 30,000 metric tons of CO_2e emissions reduction to be achieved by the gas Program Administrators to the electric Program Administrators (Statewide Plan, Exh. 1, at 43-44). The Program Administrators maintain that this transfer of emissions reduction is appropriate because the reductions at issue will be derived from projects that involve gas-to-electric fuel switching (Program Administrators Brief at 14, citing Statewide Plan, Exh. 1, App. A at 8). DOER, Acadia, and NECEC support the Program Administrators' proposal and argue that it is appropriate for the Department to focus on whether the Three-Year Plans are designed to achieve the EEA Secretary's overall GHG

emissions reduction goal rather than the allocated gas and electric sector goals (DOER Brief at 11; Acadia Brief at 13; NECEC Brief at 12).

The Department finds that the 2022-2024 Three-Year Plans are constructed to prioritize measures that provide long-term GHG emissions reductions that exceed the cumulative goal set by the EEA Secretary. While the Program Administrators, the Attorney General, and DOER agree that the Program Administrators may make up for the shortfall in planned electric GHG emissions reduction by relying on gas Program Administrators' electrification efforts, the Department notes that neither the parties, nor the Department have the legal authority to effectively modify the goals established by the EEA Secretary and it is not appropriate for customers of gas Program Administrators to be responsible for the goals of electric Program Administrators. The Department expects that the electric Program Administrators, through their implementation of this plan, will strive to achieve their GHG emissions reduction goal by the end of the Three-Year Plan term.

The Department notes that due to the timing of the Climate Act's passage, the EEA Secretary's goal was set more than two months after the Program Administrators submitted the draft Statewide Plan to the Council on April 30, 2021. Accordingly, the Program Administrators and the Council did not have full advantage of knowing the goals until late in their collaboration to develop the 2022-2024 Three-Year Plans. This will not be the situation for future Three-Year Plan development processes, as pursuant to G.L. c. 21N, § 3B, the EEA Secretary will set the goals for the then-upcoming Three-Year Plan by March 1st of the

planning year (i.e., two months before the Program Administrators submit their draft plan to the Council for review and comment).

Finally, pursuant to G.L. c. 25, § 21(d)(5), 15 months after the conclusion of the final year of the Statewide Plan, the Department must issue a statement regarding the degree to which the activities undertaken by the Program Administrators pursuant to the performance of each Three-Year Plan met the goals for the Statewide Plan set by the EEA Secretary pursuant to G.L. c. 21N, § 3B. Accordingly, in each Annual Report and Term Report for the 2022-2024 Three-Year Plan term, the Program Administrators shall describe in detail how they have implemented the Three-Year Plans in a manner that aligns with the achievement of the EEA Secretary's overall and sector-specific GHG emissions reduction goals.

3. Offerings and Enhancements

a. Sector Based Strategic Enhancements

i. Residential, Income-Eligible, Commercial and Industrial

As described in Section IV.B.2.a. above, the Program Administrators propose several strategic enhancements to address residential, income-eligible, and C&I sector barriers. The Program Administrators plan to enhance their workforce development plan to grow and diversify the workforce supporting energy efficiency programs (Statewide Plan, Exh. 1, at 70). Specifically, the Program Administrators will seek to expand the energy efficiency and HVAC workforce by recruiting and training individuals that live in environmental justice

communities, speak languages in addition to English, and are low-to moderate income (Exh. DPU-Comm 13-9).

In order to increase participation, the Program Administrators also propose a series of short- and long-term strategies to provide flexibility to participate in the programs, as well as address barriers to participation, including time and lack of understanding (Statewide Plan, Exh. 1, at 81). The Program Administrators also developed a targeted moderate income offering designed to provide enhanced HVAC incentives if a customer is income qualified and completes required weatherization measures prior to installing the HVAC equipment (Exh. DPU-Comm 5-7). The Program Administrators plan to develop an income verification process for this offering (Exh. DPU-Comm 5-7).

Among other efforts, the Program Administrators plan to continue their Residential Education program which provides educational outreach to teach Grades K-12+ students how to be efficient energy consumers (Statewide Plan, Exh. 1, at 117-118). The Department reminds the Program Administrators that the information they provide to schools must be accurate and in alignment with the Commonwealth's energy policies and goals.

NSTAR Electric, NSTAR Gas, and EGMA also propose to offer Program Administrator-specific enhancements to the Residential Education Program (Statewide Plan, Exh. 1, App. G.2 - Eversource). The Department notes, however, that most of the purported enhancements to the Statewide Plan mirror elements of the Residential Education Program. For example, the elements of the proposed enhancement to expand the vocational high school work force development program to include internship opportunities, the

Kill-a-Watt meters at local libraries, and teacher workshops are part of the statewide program (c.f., Statewide Plan, Exh. 1, at 117-119 and App. G.2 - Eversource at 1). The inconsistent classification of almost identical statewide and Program Administrator-specific offerings added an unnecessary and unappreciated layer of complexity to the Department's review of the Three-Year Plans. Going forward, each Program Administrator shall share its specific enhancements with the other Program Administrators sufficiently in advance of finalizing the Three-Year Plans to ensure that they accurately differentiate statewide and Program Administrator-specific offerings.

The Program Administrators' proposed improvements for the income-eligible sector include: (1) emphasis of heat pumps paired with weatherization and ADR; (2) development of a centralized single-family intake website to complement LEAN's existing multifamily website; (3) increased multifamily opportunities inclusive of customized deep energy retrofit approaches, incentives for common area laundry facilities, remote monitoring and building optimization, and a targeted small multifamily landlord engagement strategy; (4) an updated statewide mixed-income protocol for homes with three to four units, where only one unit is income eligible; and (5) improved remote assessments and interactions in light of the COVID-19 pandemic (Statewide Plan, Exh. 1, at 111-115).

The Program Administrators propose several strategies for the C&I sector, which include: (1) increasing participation of microbusinesses through the Main Streets offering; (2) developing a technically proficient and diverse workforce; (3) improving participation focusing on awareness, understanding, and accessibility of program offerings; (4) providing

technical assistance and tools to increase customer and vendor knowledge in energy efficiency program guidelines; and (5) providing additional C&I optimization measures, such as developing prescriptive weatherization and air sealing offerings, introducing low-cost tuning measures for existing equipment and controls, and developing custom express tools for repeatable low-cost C&I measures (Statewide Plan, Exh. 1, at 138-157). The Department finds that these strategic enhancements are reasonably designed to track and address identified barriers and emphasize new technologies.

With respect to NEGPA's recommendation to use a measure life of 30 years for each ground source heat pump measure, the Program Administrators state that they are developing prescriptive C&I ground source heat pump offerings with measure lives of 25 years (Statewide Plan, Exh. 1, at 134-135; Exh. DPU-Comm 10-3 (Att.)). Recognizing that strategic electrification is an evaluation research priority for the 2022-2024 Three-Year Plan term, the Department directs the Program Administrators to perform a review of the TRM for each prescriptive electrification offering before the next Three-Year Plan filing to ensure the accuracy of measure assumptions (Statewide Plan, Exh. 1, App. H, at 17).

ii. Hard-to-Reach

As described in Section IV.B.2.a.iv above, the Three-Year Plans include several proposed strategies to address participation barriers for hard-to-reach customers in order to deliver more equitable access to and participation in energy efficiency, particularly among

those groups who have historically participated at lower rates[60] (Statewide Plan, Exh. 1, at 17). The Department finds that these efforts, as modified herein, will promote equity and help the Program Administrators pursue all cost-effective energy efficiency. G.L. c. 25, §§ 1A, 21(b)(1).

One identified strategy is the Community First Partnership Program, which is the second iteration of the Municipal & Community Partnership Strategy initially launched during the 2019-2021 Three-Year Plans term (Statewide Plan, Exh. 1, at 18). Under the Community First Partnership Program, the Program Administrators will partner with local communities to increase the reach of energy efficiency savings, with an emphasis on environmental justice communities (Statewide Plan, Exh. 1, at 68-70). The Program Administrators intend to give priority to the 38 Targeted Communities in this program.

The Department supports the Program Administrators' efforts to leverage the community and municipal partnerships to increase participation in energy efficiency programs by historically underserved populations. The data driven approach and reliance on the results of third-party evaluations to identify key barriers to participation, particularly non-financial barriers, will help the Program Administrators to develop program delivery models to

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60 The Program Administrators conducted a series of studies during the 2019-2021 Three-Year Plan term to assess participation rates and barriers to participation. These studies include the 2013-2017 Residential Non-Participant Profile Study, the Residential Non-Participant Market Characterization and Barriers Study, and the C&I Small Business Non-Participant Customer Profile Study (Exh. DPU-Comm 2-8, Att. (a)-(c)).

improve access of hard-to-reach customers (Statewide Plan, Exh. 1, at 22, 66-68; Exh. DPU-Comm 2-12).

The Department is concerned, however, with the roll out of the Community First Partnership Program. The Program Administrators state that they released the application for the Community First Partnership Program prior to finalizing the list of 38 Targeted Communities (Tr. 2, at 249-250). The Program Administrators explain that, after the release of the application, they made two adjustments to the criteria used to select the priority communities based on conversations with DOER. Specifically, the Program Administrators increased the maximum historical combined gas and electric participation rate from 30 percent to 32 percent and added an additional criterion that median household income of the community must be less than 100 percent of state median household income (Tr. 2, at 258-260). As a result, several municipalities were rendered ineligible for priority status, while others were made newly eligible (Tr. 2, at 260). The Program Administrators state, however, that they did not communicate the changes to the selection criteria to the affected municipalities (Tr. 1, at 167-168). Further, as of the close of the evidentiary record, the Community First Partnership Program application had not yet been updated to reflect the correct priority municipalities.[61] The poor timing of the criteria changes and lack of

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[61] The Community First Partnership Program application is available at: https://www.masssave.com/-/media/Files/PDFs/Partners/1121-MS-COMM-2664490-2022-Application.pdf?la=en&hash=5E84EFC3C3B9F9363AC38FF2CE67C51FB43FC9F4 (last visited December 17, 2021).

communication and transparency in the eligibility process for the Community First Partnership Program create unnecessary confusion for municipalities and added an unnecessary and unappreciated layer of complexity to the Department's review of the Three-Year Plans (see Tr. 1, at 166-172; Tr. 2, at 250-261). Going forward, the Program Administrators shall finalize all critical details of Three-Year Plan offerings well in advance of filing with the Department. In addition, the Program Administrators must ensure that they communicate appropriately with potential program participants, especially with respect to eligibility criteria, deadlines, and other requirements that may affect participation.

Despite our concerns with the roll out of the Community First Partnership Program, the Department finds that the proposed approach is appropriate to address barriers and increase participation among communities/customer segments with historically lower participation rates. While, as discussed below, the Department modifies the criteria used to identify specific communities for targeted investment, to increase participation, as well as for the purpose of performance incentives, we will not require the Program Administrators to change the priority municipalities for the Community First Partnership Program. One purpose of the Community First Partnership Program is to test methods for overcoming systemic barriers to participation for certain populations (Tr. 2, at 255). Because the Program Administrators are seeking to test strategies that may lead to broader programmatic changes, the Department finds that it is appropriate for the Community First Partnership Program to focus on communities that have higher concentrations of lower income customers, even if the community does not have historically lower participation (Tr. 2,

at 248, 255-256). Further, by design, the Community First Partnership Program is not intended to serve all 38 Targeted Communities and may include communities outside of the 38 Targeted Communities (Exh. DPU-Comm 13-18, Att.).

The Program Administrators state that one of the key strategic priorities of the 2022-2024 Three-Year Plans is establishing more equal access to and participation in energy efficiency, particularly among those groups who have historically participated at lower rates, including renters/landlords, moderate income customers, limited English-proficiency customers, and microbusinesses (Statewide Plan, Exh. 1, at 17). During the 2019-2021 Three-Year Plans term, the Program Administrators commissioned a series of studies that were completed in 2020, including the Residential Non-Participant Customer Profile Study, the Residential Non-Participant Market Characterization and Barriers Study, and the C&I Small Business Non-Participant Customer Profile Study (Statewide Plan, Exh. 1, at 17). These studies identified groups of customers that were less likely to participate in the energy efficiency programs (Statewide Plan, Exh. 1, at 17). Specifically, the studies found that limited English-proficiency customers were more likely to be unaware of the programs than customers who are more proficient; however, there was little difference in participation rates based on language proficiency (Exh. DPU-Comm 2-8, Att. B). Further, the study found that limited English-proficiency customers were more likely to be renters (Exh. DPU-Comm 2-10).

The studies further found that moderate income customers were equally likely to be participants as nonparticipants; however, moderate income customers were six percent less

likely to participate than customers with higher incomes (Exh. DPU-Comm 2-11). The studies did not include findings regarding race and participation rates (see Exh. DPU-Comm 2-8, Atts. A and B).[62] The most significant factor affecting participation was renter status (Statewide Plan, Exh. 1, at 19). The studies showed that renters were ten percent less likely to participate in the energy efficiency programs and more than 30 percent less likely to be aware of the programs (Statewide Plan, Exh. 1, at 19).[63]

The Program Administrators testified that, in collaboration with DOER, the Attorney General, and the Council's equity working group, they determined that the best way to focus on increasing participation from customer segments with historically lower participation rates was to use a geographic approach to select a set of communities with high concentrations of low-participation customers (Tr. 2, at 246). The Department, however, has concerns with the final criteria the Program Administrators used to identify the 38 Targeted Communities. Specifically, the Department finds that the final set of criteria was overly limiting, placing focus on too narrow a subset of municipalities based primarily on income. While income is a factor in participation rates, the Residential Non-Participant Customer Profile Study and the Residential Non-Participant Market Characterization and Barriers Study show that limited

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62 The studies also provided the historic participation rates of residents by municipality (Exh. DPU-Comm 2-14).

63 As discussed below, the Department has repeatedly stated that the Program Administrators must address the participation barriers and achievement of deeper participant savings for renters. See 2019-2021 Three-Year Plans Order, at 39, 41-43, 95; 2016-2018 Three-Year Plans Order, at 26-27; 2013-2015 Three-Year Plans Order, at 45-48.

English proficiency and renter status are more significant factors in participation rates (Exh. DPU-Comm 2-8, Atts. A and B). Further, the Department finds that a 32 percent threshold to measure past participation is not appropriate, given that it meets the statewide average combined gas and electric consumption-weighted participation rate and, therefore, does not address historically low participation. Overall, the Department determines that the set of eligibility criteria established by the Program Administrators is not appropriately tailored to achieve the goal of increased equity by focusing on communities with lower participation rates and hard-to-reach customers (Exh. DPU-Comm 2-14; Tr. 2, at 246-260).

Based on the discussion above, the Department determines that it is appropriate to use a geographic approach and target communities with verified lower participation rates through evaluation studies to determine eligibility for the Program Administrators' targeted equity investment and outreach strategies. Accordingly, the Program Administrators shall use the three-pronged test described below to identify communities eligible for the Program Administrators' targeted equity investment and outreach strategies ("Targeted Hard-to-Reach Communities").[64] Eligible municipalities must: (1) be served by an electric and/or gas Program Administrator; (2) contain at least one environmental justice population as defined by the EEA Environmental Justice Policy,[65] and (3) have historically low participation rates.

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64 As discussed in Section VII, below, the Program Administrators also shall use the three-prong test for the equity component of the performance incentive model.

65 The EEA Environmental Justice Policy defines environmental justice populations as neighborhoods (U.S. Census block group data for minority criteria, and American Community Survey data for state median income and English isolation criteria) that

The Department defines "historically low" participation as those municipalities with a combined consumption-weighted participation rate of 27 percent or less, as presented in "Column E" of Exh. DPU-Comm 2-14, Att. A. The Department finds that setting the participation rate at five percent below the statewide average to identify Targeted Hard-to-Reach Communities ensures that the Program Administrators focus on communities with historically lower participation rates.[66]

Municipality-wide, the City of Boston would not meet the criteria for inclusion as a Targeted Hard-to-Reach Community. The City of Boston, however, contains nearly a tenth of the Commonwealth's population (see Statewide Plan, Exh. 1, at 21). The Department finds the Program Administrators' proposal to prioritize specific neighborhoods in the City of Boston is appropriate to enhance participation among renters and environmental justice populations (see Statewide Plan, Exh. 1, at 21). Accordingly, the Program Administrators shall include the following neighborhoods in the City of Boston as Targeted Hard-to-Reach

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meet one or more of the following criteria: (1) annual median household income is not more than 65 percent of the statewide annual median household income; (2) minorities comprise 40 percent or more of the population; (3) 25 percent or more of households lack English language proficiency; or (4) minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income. See Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs) (Updated June 24, 2021) available at https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.

66 The statewide average combined consumption-weighted participation rate is 32 percent (Exh. DPU-Comm 2-14(b)).

Communities: Allston, Brighton, Dorchester, East Boston, Fenway, Mattapan, Mission Hill, and Roxbury (see Statewide Plan, Exh. 1, at 21).[67]

In addition, as the Program Administrators explained, the subsets of customers that are identified as having lower participant rates are captured in the definition of environmental justice populations (i.e., lower income customers and limited English-proficiency customers). Accordingly, the Department finds that using the EEA Environmental Justice Policy definition of environmental justice populations captures the communities and customer characteristics that the Residential Non-Participant Customer Profile Study and the Residential Non-Participant Market Characterization and Barriers Study identified correlate with hard-to-reach customers, as well as aligns with the Commonwealth's equity policies.

Application of the three-pronged criteria for the Targeted Hard-to-Reach Communities increases the number of environmental justice communities eligible for targeted enhanced energy efficiency investments and outreach that otherwise would have been left out using the Program Administrators' proposed criteria. A stated goal of the Three-Year Plans is to ensure a more equitable distribution of energy efficiency savings and benefits for

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67 The Program Administrators shall submit a compliance filing identifying Targeted Hard-to-Reach Communities that meet the criteria set forth above. The Program Administrators shall determine planned benefit levels with the method used to establish planned benefits for the original 38 Targeted Communities (Tr. 3, at 413). Each Program Administrator shall examine actual achievements in the Targeted Hard-to-Reach Communities from 2017 through 2019 (based on their tracking systems) to create a comparable three-year baseline (Tr. 3, at 413). The Program Administrators then shall examine the percentage of production in those years and apply that percentage to this Three-Year Plan with an equivalent increase (Tr. 3, at 413).

hard-to-reach customers. The Department finds that our revised criteria to identify the Targeted Hard-to-Reach Communities better positions the Program Administrators to accomplish this goal.

In order to evaluate the success of the targeted efforts to increase participation and deliver programs in an equitable manner, the Department directs the Program Administrators to track participation in all service territories by municipality[68] and to conduct an updated residential non-participant customer profile study prior to the 2025-2027 Three-Year Plan filing. Each Program Administrator also shall include detailed Program Administrator-specific testimony in the 2025-2027 Three-Year Plan filing (1) describing how the Program Administrator sought to increase participation in the communities that meet the above criteria and (2) an analysis of whether actual increases occurred.

In addition, the Program Administrators state that they are developing a renter-unit strategic plan with marketing and outreach strategies beyond what is included in the Three-Year Plans, and they intend to implement this strategic plan in the third or fourth quarter of 2022 (Exhs. DPU-Comm 5-13; DPU-Comm 12-24).[69] Since 2012, the Department repeatedly has stated that the Program Administrators must address the participation barriers and achievement of deeper participant savings for renters. See

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[68] The Program Administrators shall track participation by neighborhood for the City of Boston.

[69] The Program Administrators did not intend to file the finalized plan with the Department (Exh. DPU-Comm 12-24).

2019-2021 Three-Year Plans Order, at 39, 41-43, 95; 2016-2018 Three-Year Plans Order, at 26-27; 2013-2015 Three-Year Plans Order, at 45-48. The Program Administrators did not, however, submit the formal plan in their filings to address how they will serve renters. Further, the Program Administrators' strategic plan currently in development will not be implemented until 2022 is almost over. Contrary to the Program Administrators' assertions, the Department is unconvinced that incentives for electric lawn mowers, leaf blowers, trimmers, and chainsaws are appropriate enhancements for renters at this time (Tr. 2, at 236-237, 244).[70] Accordingly, no later than September 30, 2022, the Program Administrators shall file a finalized strategic renter plan with the Department, describing what new protocols have been put into place and what additional steps remain to be taken to increase service to renters and landlords.

Finally, the Department has recognized that tracking demographic data specific to age, race, ethnicity, disability, income, and primary language could implicate customer privacy issues and may deter participation in energy efficiency programs and initiatives by customers who do not want to disclose this information. 2019-2021 Three-Year Plans Order, at 166-167. For these reasons, the Department will not adopt CLF's data tracking recommendations. Nonetheless, the Department reminds the Program Administrators of their

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[70] As discussed in Section IV.D.3.b, below, the Department supports the expansion of the programs to include incentives for electric lawn mowers, leaf blowers, trimmers, and chainsaws as part of the Program Administrators' strategic electrification efforts where the measures result in lower overall energy use, decreased energy costs, and reductions in GHG emissions.

obligation to continuously improve customer outreach and other methods of attracting customers to maximize participation. The Department fully expects the Program Administrators will appropriately track participation to inform the implementation of the Three-Year Plans.

b. Strategic Electrification

i. Introduction

The Program Administrators propose to prioritize strategic electrification efforts during the 2022-2024 Three-Year Plan term. The Program Administrators maintain that the Three-Year Plans demonstrate a necessary and measurable shift toward electrification and away from traditional fossil-fuel based heating and cooling measures (Statewide Plan, Exh. 1, at 11). The Program Administrators further claim that expanded strategic electrification offerings are needed to meet the GHG emissions reduction goals set by the EEA Secretary (Statewide Plan, Exh. 1, at 11). In this regard, the Program Administrators and many intervenors state that increased strategic electrification will help the Commonwealth achieve its net zero GHG emissions goals by reducing use of fossil-fuel heating and leveraging low-carbon electricity from the grid.

Strategic electrification through energy efficiency alone will not achieve the Commonwealth's climate goals. Many other policies and customer decisions outside the scope of energy efficiency programs must be put in place to ensure that load growth from electrification will, in fact, reduce GHG emissions. In particular, energy policies including RPS, the Solar Massachusetts Renewable Target ("SMART") Program (PV feed-in tariff),

offshore wind procurement, and imports of hydroelectric power are additional and necessary pathways that will increase the proportion of low-carbon electricity on the grid and, in time, provide cleaner energy to meet the needs of a growing electric load in Massachusetts (Statewide Plan, Exh. 1, at 11).

The Program Administrators' strategic electrification approach includes robust incentives for heat pumps, as well as the development of a heating comparison calculator and a heat pump installer network to provide the tools and workforce necessary to achieve the Three-Year Plan goals (Statewide Plan, Exh. 1, at 15-17). Additional strategic electrification strategies include the introduction of an all-electric new construction pathway for residential buildings (New Construction Path-to-Zero offering), increased technical assistance and financial support for all-electric new construction commercial buildings that minimize overall energy consumption, and continued promotion of Passive House certifications for commercial and residential new construction projects (Statewide Plan, Exh. 1, at 13). In addition to their strategic electrification efforts, the Program Administrators state that they will continue to focus on weatherization as a foundational measure that reduces energy use and prepares residential and commercial buildings for strategic electrification (Statewide Plan, Exh. 1, at 13). These proposed strategies received wide support from intervenors.

Consistent with the Climate Act, the Department supports efforts to cost-effectively reduce energy use and GHG emissions, while minimizing costs to ratepayers. NECEC argues that neither the Green Communities Act nor the Department's Guidelines specifically require strategic electrification to result in an individual customer reduction in energy usage

for inclusion in the Three-Year Plans (NECEC Brief at 26). However, contrary to NECEC's assertions, strategic electrification in the context of G.L. c. 25, § 21, requires that electrification reduce customer energy consumption to be incorporated in the efficiency investment plan. In addition, electrification must meet the additional statutory requirements of cost-effectively reducing GHG emissions and lowering costs for customers.[71] In this regard, the Department agrees with the Program Administrators' assessment that their "mandate [is] focused on providing interventions in the market to support customers in their adoption of measures that produce benefits through the reduction of energy consumption or peak demand," while measures that reduce emissions, such as low-carbon fuels or electricity, "except to the extent that they would lead to a reduction in energy consumption and/or demand, would not be a component of [the Program Administrator's] mandate" (Tr. 1, at 76-77).

The Department finds that, with the required modifications discussed below, the Program Administrators' strategic electrification offerings are consistent with the

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[71] During evidentiary hearings, the Program Administrators indicated that they use the terms "electrification" and "strategic electrification" interchangeably (Tr. 3, at 450, 456). The Program Administrators indicate that they do not see a difference between the terms but consider their proposals to be "strategic electrification" (Tr. 3, at 456). There is, however, a difference between electrification, in general, and strategic electrification in the context of the Green Communities Act. Specifically, the Green Communities Act authorizes the Program Administrators to implement strategic electrification in the context of delivering energy efficiency that cost-effectively reduces GHG emissions and minimizes ratepayer costs.

requirements of G.L. c. 25, § 21.[72] Below, the Department addresses the Program Administrators' proposed strategies regarding the requirements to weatherize, the heating comparison calculator, and cost-effectiveness.

ii. Weatherization

The Program Administrators plan to make strategic electrification a point of focus under the Three-Year Plan (Statewide Plan, Exh. 1, at 11). The Program Administrators state that they will continue to focus on weatherization as part of their strategic electrification efforts because weatherization reduces energy use, and prepares residential and commercial buildings for electrification (Statewide Plan, Exh. 1, at 13; Exh. DPU-Comm 5-9). To encourage adoption of weatherization prior to electrification, the Program Administrators intend to provide extensive customer education and provide an online heating comparison calculator, discussed below (Exh. DPU-Comm 5-9). The Program Administrators claim they will also follow up with customers that receive heat pump rebates but did not receive weatherization services (Exh. DPU-Comm 5-9). In terms of incentives, the Program Administrators intend to require weatherization as a prerequisite for moderate income

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[72] The Program Administrators calculate GHG emissions reductions from all electric energy efficiency measures using an average electric emission factor (see, e.g., Exh. BGC-5 (Rev.)). This method is consistent with the EEA Secretary's calculation of GHG emissions reductions for 2025 and 2030 under G.L. c. 21N, § 3B (Statewide Plan, Exh. 1, App. D at 8). However, in order for the Department to assess the GHG emissions impacts of strategic electrification pursuant to G.L. c. 25, § 21(b)(2), particularly as the Commonwealth deploys intermittent renewable generation, the Program Administrators shall evaluate the GHG emissions impacts of strategic electrification using electric generation emissions aligned with measure load shapes.

customers to receive an enhanced incentive for heat pumps (Exh. DPU-Comm 12-18). In regard to low-income customers, the Program Administrators state that weatherization is provided along with heating system upgrades (Exh. DPU-Comm 12-18). The Program Administrators assert, however, that weatherization will not be required for a customer to get a heat pump incentive through the program in order to give flexibility to customers and contractors (Exh. DPU-Comm 12-18).

The Green Communities Act states that strategic electrification may increase electricity consumption, but stipulates that such efforts must be designed to result in cost-effective reductions in GHG emissions while minimizing ratepayer bill impacts. G.L. c. 25, § 21(b)(2)(iv)(A). Further, the Program Administrators, as entities regulated by the Department, must deliver their strategic electrification efforts in a manner that prioritizes safety, reliability, security, affordability, equity, as well as GHG emissions reductions pursuant to G.L. c. 21N, § 3B.[73] To meet these competing but essential requirements, the Program Administrators must motivate customers to adopt clean energy heating systems in an optimized manner.

As the Program Administrators state, weatherization is a foundational measure that reduces energy use and prepares residential and commercial buildings for electrification (Statewide Plan, Exh. 1, at 13). Without prior weatherization customers will need to install

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[73] Increased bill impacts are of particular concern as customers across the Commonwealth, particularly lower income customers, continue to struggle with the on-going impacts of the COVID-19 pandemic.

higher capacity heat pumps, which may not be right-sized and operate less efficiently under colder outside air temperatures (Tr. 3, at 483-484; Exhs. DPU-Comm 3-6; DPU-Comm 3-8; DPU-Comm 5-9; DPU-Comm 5-10; DPU-Comm 5-11; DPU-Comm 5-12; DPU-Comm 5-17; DPU-Comm 12-13). While the Program Administrators state that they will encourage right-sizing through customer and contractor education efforts, the Program Administrators do not intend to require contractors to certify (1) that a customer's home is properly weatherized in advance of heat pump installation or (2) that the contractor properly sized the heat pump prior to installation (Exh. DPU-Comm 12-11). Failing to weatherize and to properly size a heat pump prior to installation potentially increases energy costs for customers (Tr. 3, at 474).[74] The Department finds that the Three-Year Plans should be designed to ensure weatherization is completed prior to electrification to the extent possible in order minimize the bill impacts, particularly for low- and moderate income customers.

The Department also considers the impact of electrification on the Commonwealth's electric grid. The Program Administrators anticipate increased electricity usage from electrification measure installations; however, they have not considered the effects that this increase in demand would have on electric grid resiliency and reliability (Tr. 3, at 462-463; Exh. DPU-Comm 12-14). Considering the potential energy savings lost from customers not

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74 The Department notes that the risk of installing heat pumps without weatherization is exacerbated because the Program Administrators plan to receive enhanced performance incentives for electrification rather than weatherization. The Department addresses the potential for perverse performance incentives through the electrification component in Section VII, below.

weatherizing their households before heat pump installation, electrification may cause unnecessarily high demand on the electric grid which, in turn, may impact system resiliency and reliability. Further, system upgrades may be necessary to accommodate the higher than needed electric load, resulting in increased costs for all ratepayers.

Due to the potential unintended impacts on the safety, reliability, security, and affordability on the electric distribution system, and the potential issues of affordability and equity for customers adopting electrification measures, the Department finds that encouragement of weatherization prior to heat pump installation through education alone may not be a sufficient safeguard.[75] The Program Administrators must seek to weatherize prior to or as part of an electrification project in order to ensure that overall energy consumption will decrease, while minimizing ratepayer bill impacts for purposes of acquiring all cost-effective energy efficiency under the Green Communities Act. The Department notes that prioritizing weatherization is consistent with the Massachusetts 2050 Decarbonization Roadmap at 48-49,[76] which notes that combining weatherization with electrification, allows building occupants to benefit from superior thermal comfort, noise reduction, greater resiliency, and improved ventilation and indoor air quality, as well as reduce the need for investment in the

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75 The Department notes that the obvious synergy between weatherizing a home to reduce thermal loss and right-sizing heating equipment, which both lead to collectively reducing a customer's bill, have been consistent and key benefits provided by the Mass Save program.

76 The Massachusetts 2050 Decarbonization Roadmap (December 2020) was prepared by the Executive Office of Energy and Environmental Affairs, and is available at: https://www.mass.gov/info-details/ma-decarbonization-roadmap.

electricity distribution system to meet that load, and for additional renewable energy generation and reliability resources.

Some of the Program Administrators' proposals seek to address the above concerns. The Program Administrators require weatherization for some moderate income customers as a prerequisite to accessing enhanced heat pump incentives (Exhs. DPU-Comm 5-7; DPU-Comm 12-11; DPU-Comm 12-21). A differentiated incentive approach, like the proposed moderate income offering, may provide some customers with needed flexibility, while increasing the likelihood that customers will weatherize prior to electrifying their heating and cooling systems. The Department finds that it is prudent, particularly during the early phases of the Program Administrators' strategic electrification efforts, to ensure that a similar differentiated incentive offer is available to market rate customers, in order to motivate all residential customers to optimize fuel conversions by lowering energy consumption as much as possible and then right-sizing new clean energy heating systems. Accordingly, the Program Administrators shall encourage all residential market rate customers to weatherize their homes prior to installing heat pumps through robust education[77] and by offering them an incentive structure similar to that of moderate income customers (i.e., a standard incentive for heat pump conversions without prior weatherization and an

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[77] The Program Administrators shall disclose potential fuel savings and bill impacts to customers seeking to adopt electrification measures. These communications should help customers understand the net impact on their overall energy costs from reducing usage of one fuel and increasing electric usage.

enhanced incentive for prior weatherization).[78] As noted above, the Program Administrators state that weatherization is provided along with heating system upgrades for low-income customers (Exh. DPU-Comm 12-18). Since weatherization and heat pump installations are done at no cost to low-income customers, requiring pre-installation weatherization should not present as many barriers for these customers as it might for market-rate customers. Accordingly, the Department finds that the Program Administrators must weatherize low-income buildings prior to installing heat pumps, unless specific conditions make this impractical. On or before May 2, 2022, the Program Administrators shall file with the Department detailed protocols and programmatic changes consistent with the above directives. In this filing, the Program Administrators shall also include the protocols they will adopt to ensure electrification marketing materials reach all residential customers. The Department supports the Program Administrators' efforts to deploy strategic electrification in a manner that results in a positive customer experience and drives market transformation (Statewide Plan, Exh. 1, at 12). In order to drive the level of decarbonization required by the Climate Act, positive customer experience in terms of comfort, reliability, and operating cost will be essential to drive the levels of electrification envisioned by the Massachusetts 2050 Decarbonization Roadmap.

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78 The Program Administrators state that they may offer enhanced incentives for comprehensive projects, including those that combine weatherization and heat pumps (Statewide Plan, Exh. 1, at 98).

iii. Heating Comparison Calculator

Regarding the proposed heating comparison calculator, the Program Administrators referenced the project numerous times throughout the record, but do not currently have a working version of the calculator online (see, e.g., Statewide Plan, Exh. 1, at 75; Exhs. DPU-Comm 7-3; DPU-Comm 12-19; DPU-Comm 12-20; Tr. 3, at 365, 380, 464, 472). As the Program Administrators present the heating comparison calculator as a critical component of their strategic electrification plan, no later than May 2, 2022, the Program Administrators shall provide the Department with evidence that the heating comparison calculator is fully operational (including a full description of the final calculator).

iv. Non-Cost-Effective Strategic Electrification Measures

The Program Administrators plan to offer several non-cost-effective electrification measures that still offer energy savings (Exhs. DPU-Comm 5-3; DPU-Comm 5-6). The Program Administrators may offer non-cost-effective strategic electrification measures that reduce customer energy use, lower GHG emissions, and lower customer energy costs within cost-effective strategic electrification offerings. As discussed above, the Green Communities Act requires that strategic electrification offerings themselves be cost-effective. G.L. c. 25, § 21(b)(2)(iv)(A). However, the Program Administrators do not present electrification measures in the Energy Efficiency Data Tables in a manner that allows the Department to determine if the offering, by sector, is cost-effective. Accordingly, the Program Administrators shall revise the Energy Efficiency Data Tables in a manner that provides the allocated costs, benefits, and savings associated with their electrification offerings by sector.

The revised tables shall be submitted as a compliance filing in these proceedings, as well as in future Annual Reports and Term Report proceedings. The Department expects all Program Administrators, regardless of planned cost-effectiveness, to implement their strategic electrification offerings in a cost-effective and cost-efficient manner.

v. Conclusion

Strategic electrification is a key component of the 2022-2024 Three-Year Plans and a significant portion of the Program Administrators' proposed budgets. Even for non-participants, most Program Administrators[79] expect significant bill impacts related to implementing their Three-Year Plans (Exhs. EGMA-6; LU-6 (Non-Participant Bill Impacts); NG-Gas-6, at 10-160; NSTAR-Gas-6; Compact-6; FGE-Electric-6, at 16-20; NG-Electric-6, at 7-22, 26-41, 45-60, 62-77; NSTAR-Electric-6). As discussed in Section VIII, below, to mitigate expected bill impacts, the Department will establish a cap on budgets. More specifically, the Program Administrators will not be permitted to recover any costs in excess of approved program budgets unless the Program Administrator receives approval by the Department to increase the program budget. In order to increase the budget, the Program Administrator must demonstrate that the proposed budget increase will result in an increase in

[79] Berkshire estimates that its energy efficiency surcharge ("EES") for non-participant residential classes will increase in 2022 and decrease in 2023 and 2024, resulting in a net decrease in the EES over the term (Exh. BGC-6, at 1-34). However, Berkshire does expect modest increases for non-participant C&I customers during the Three-Year Plan term (Exh. BGC-6, at 35-40). Unitil (Gas) expects modest decreases in its EES for non-participants during the Three-Year Plan term (Exh. FGE-Gas-6, at 1).

kWh or therm savings and, thereby, provide additional direct resource benefits to electric or gas customers above planned levels.

After review and subject to the directives set forth above, the Department finds that the Program Administrators have demonstrated their proposed strategic electrification strategies are (1) designed to provide cost-effective GHG emissions reductions, while minimizing costs to ratepayers; and (2) an appropriate part of the Program Administrators' overall plan to provide all cost-effective energy efficiency and demand reductions under the Green Communities Act.

c. Active Demand Reduction

The electric Program Administrators propose several statewide ADR offerings as part of their 2022-2024 Three-Year Plans, building off lessons learned through the implementation of similar measures in the 2019-2021 Three-Year Plans (see, e.g., Exh. BGC-2, at 92-93). The ADR offerings seek to lower system peak demand by dispatching controllable, customer-owned, behind-the-meter technologies, such as thermostats, battery energy storage, and lighting controls (Statewide Plan, Exh. 1, at 104-105, 171). The Department addresses the electric Program Administrators' proposed solar PV inverter measure in Section IV.D.3.d. The electric Program Administrators' remaining ADR proposals are addressed below.

The electric Program Administrators propose to offer performance-based incentives for each ADR offering (see, e.g., Exh. EGMA-2, at 92-93). The Department has found that pay-for-performance incentives offer appropriate protection to ratepayers because the

incentives will be paid only for actual performance. 2019-2021 Three-Year Plans Order, at 34. In addition, the electric Program Administrators propose to offer a five-year incentive rate lock for certain participants in the daily dispatch offerings (Statewide Plan, Exh. 1, at 173). The five-year rate lock fixes the rate at which the electric Program Administrators will compensate eligible participants for performance in the daily dispatch offerings; however, it is not a revenue guarantee (Statewide Plan, Exh. 1, at 173). Nonetheless, the Department has found that a rate lock may be appropriate to provide prospective battery energy storage developers and customers with a degree of certainty with respect to the incentive the customer could expect to receive. See 2019-2021 Three-Year Plans Order, at 34. After review, the Department approves the electric Program Administrators' proposal to offer a five-year incentive rate lock for customers installing new battery energy storage systems as part of the daily dispatch offerings. The five-year lock is limited to the installation of new battery energy storage systems; after the expiration of the five-year lock, the customer may receive the then-current performance-based incentive levels.

The Department notes, however, as increasing amounts of battery energy storage are deployed on the grid, a five-year incentive rate lock may no longer be warranted. Accordingly, the electric Program Administrators shall conduct an evaluation of the incentive rate lock to assess its efficacy and whether, as increasing amounts of battery energy storage are deployed on the grid, a five-year incentive rate lock continues to be warranted. 2019-2021 Three-Year Plans Order, at 34-35. The electric Program Administrators shall address the results of this study in their next Three-Year Plan filings.

In describing their residential ADR program, the electric Program Administrators state that most customers learn about the offerings through the thermostat itself (Statewide Plan, Exh. 1, at 106). The Program Administrators explain that many customers installing smart thermostats controlling central air conditioning are prompted to sign up for an ADR program while they are setting up their device (Statewide Plan, Exh. 1, at 106). The electric Program Administrators maintain that this is an effective means to enroll customers in ADR programs (Statewide Plan, Exh. 1, at 106).

For smart thermostat purchases made through the Online Marketplace,[80] the electric Program Administrators will introduce point-of-sale ADR promotions (Statewide Plan, Exh. 1, at 106). The electric Program Administrators state that the point-of-sale ADR promotion will entail pre-enrollment in the ADR program (Statewide Plan, Exh. 1, at 81, 107). The Program Administrators do not, however, describe the pre-enrollment process and whether it is "opt-in" or "opt-out." The Department is concerned about the safety of children, the elderly, and medically compromised individuals residing in a household that is auto-enrolled in an air conditioning ADR program. Accordingly, the Department directs the Program Administrators to employ opt-in customer enrollment for all residential and income-eligible ADR programs, with no automatic enrollment upon smart thermostat purchase or installation.

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80 The Online Marketplace is a website that allows customers to purchase energy efficiency products net of any incentive (i.e., available rebates are already applied) (Statewide Plan, Exh. 1, at 61).

The electric Program Administrators also seek approval to offer some form of a statewide EV load management offering (Statewide Plan, Exh. 1, at 106). As described above, NSTAR Electric and National Grid (electric) state that they are currently conducting a self-evaluation of the EV activities they undertook during the 2019-2021 Three-Year Plans term, but have not yet decided which approach they will use during the current Three-Year Plans term (Statewide Plan, Exh. 1, at 106).[81] Accordingly, while NSTAR Electric and National Grid (electric) each propose to implement an EV load management offering by summer 2022, they do not describe the proposed offerings in their Three-Year Plans (Statewide Plan, Exh. 1, at 106).[82]

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81 During the 2019-2021 Three-Year Plans term, NSTAR Electric conducted a research and development project assessing the dispatch of signals through connected EV supply equipment (Statewide Plan, Exh. 1, at 106). National Grid (electric) implemented an EV load management offering using a telematics-based approach (Statewide Plan, Exh. 1, at 106). National Grid (electric) conducted a Program Administrator-specific offering and not a demonstration program as suggested by Sunrun (Exh. Sunrun-Common 1-3, at 2; Sunrun Brief at 2, 8-9). 2019-2021 Three-Year Plans Order, at 31.

In the Three-Year Plan filings, NSTAR Electric and National Grid (electric) state that they have not yet decided which approach they will use during the current Three-Year Plans term (Statewide Plan, Exh. 1, at 106). However, in response to discovery, NSTAR Electric and National Grid (electric) state that they each intend to implement both approaches during this Three-Year Plans term (Exh. Sunrun-Common 1-3, at 2). This information was not included in the Three-Year Plan filings.

82 The electric Program Administrators offer no reason why an EV load management proposal was not fully developed in time to include in the Three-Year Plan filings. This delay is not understandable given that NSTAR Electric and National Grid (electric) have been conducting EV load management activities since 2019. Massachusetts Electric Company/Nantucket Electric Company, D.P.U. 18-118,

The Department strongly supports the various EV activities being undertaken or proposed by the electric distribution companies outside of energy efficiency as an important part of meeting the Commonwealth's climate goals. See, e.g., NSTAR Electric Company, D.P.U. 20-74, at 40 (2021); Grid Modernization, D.P.U. 15-120 through D.P.U. 15-122, at 152, 159, 169 (2018). Similarly, the Department supports the deployment of an appropriate EV load management offering by the electric Program Administrators that reduces peak demand.[83,84] The Department cannot, however, make substantive findings regarding any proposed offering here because of the lack of detail included in the Three-Year

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Statewide Plan, Exh. 1, App. K at 3 (October 31, 2018); NSTAR Electric Company, D.P.U. 18-119, Exh. DPU-NSTAR-Electric 5-1, at 2 (December 5, 2018).

[83] The Department recognizes the potential for overlap between EV programs and the energy efficiency plan. Investigation into the Modernization of the Electric Grid - Phase Two, D.P.U. 20-69-A at 48 (2021). In D.P.U. 20-69-A at 49, the Department directed all electric distribution companies to coordinate and streamline their EV charging incentive offerings and energy efficiency offerings to avoid any potential overlaps. Specifically, the Department found that electric Program Administrators may continue to offer peak demand reduction offerings for EVs through their energy efficiency plans. However, local peak demand reduction or off-peak charging incentives should be included as part of a comprehensive offering under each electric distribution company's EV proposal. D.P.U. 20-69-A at 49 n.32.

[84] The Department has recognized there may be areas of overlap between the EV proposals in the Three-Year Plans and the electric distribution companies' grid modernization plans. The Department strongly cautions the electric Program Administrators that they must scrupulously identify and track all EV program-related costs to ensure that they do not seek to recover the costs twice (i.e., through the EES and another funding mechanism such as the grid modernization targeted cost recovery mechanism). Failure to do so will result in disallowance of those costs. D.P.U. 15-120 through D.P.U. 15-122, at 181 (2018).

Plans. Accordingly, prior to implementation, NSTAR Electric and National Grid (electric) shall file any proposed EV load management offering for Department review and approval. In any such proposal, the Program Administrators must address issues related to customers charging their EVs in multiple service territories.

With respect to the Compact's proposed EV load management offering, the Department notes that the Compact provided information in discovery that directly contradicts information it provided to the Department only one month earlier in its Three-Year Plan filing. In the Statewide Plan, the Compact and Unitil (electric) state that they will "monitor the progress of [the other electric Program Administrators'] offering in order to determine if it is a right fit for their service territories" (Statewide Plan, Exh. 1, at 106). However, in response to discovery, the Compact states that it is "planning to mirror this offering and have it available for summer 2022" (Exh. Sunrun-Common 1-3, at 2). As the Department has addressed elsewhere in this Order, any proposal must be fully described in the initial filing. Accordingly, like NSTAR Electric and National Grid (electric), the Compact shall file any proposed EV load management offering for Department review and approval prior to implementation.

After review, with the exception of the proposed EV load management measure, the Department approves the electric Program Administrators' proposed ADR offerings. The Department addresses the proposed solar PV inverter measure in Section IV.D.3.d, below.

The Department has found that the Compact's ADR offerings have the potential to impact the safety and reliability of the local distribution system in a manner that is different

from other energy efficiency programs.[85] 2019-2021 Three-Year Plans Order, at 133, citing Cape Light Compact, D.P.U. 17-84, at 21 (2018). Accordingly, the Department imposed specific requirements on the Compact as conditions to implement its ADR measures, namely that it was required to reach an agreement with NSTAR Electric regarding distribution system coordination. 2019-2021 Three Year Plans Order, at 133. The memorandum of agreement addressing distribution system coordination expired on December 31, 2021, and there is no evidence in the record to indicate that another memorandum of agreement has been executed. The Compact testified that it and NSTAR Electric had agreed to a new memorandum of agreement, but the version of this document contained in the record is unsigned and undated (Exhs. Compact-2, at 138; Compact-11, at 14). Accordingly, the Compact shall not conduct any ADR offerings until it demonstrates that it has entered into a memorandum of agreement with NSTAR Electric regarding distribution system coordination for the 2022-2024 Three-Year Plans term.

Finally, Sunrun raises concerns regarding certain program implementation process issues (Sunrun Brief at 3, 10-11). The Department's revised Guidelines address the requirements to convert a demonstration offering to a core initiative or program and the Department will not revisit that issue here. See D.P.U. 20-150-A at 24-26; Guidelines at § 3.8. As to Sunrun's remaining concerns regarding the difficulty in qualifying eligible

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[85] The Compact is not an electric distribution company and, therefore, does not have the same obligation to provide safe and reliable service. 2019-2021 Three-Year Plans Order, at 138.

devices and the lack of stakeholder involvement when transitioning a demonstration offering to a core initiative or program (Sunrun Brief at 3), the Department agrees with DOER that these concerns are best addressed at the Council level with DOER facilitating stakeholder input.

d. Solar Photovoltaic Inverters

During the 2019-2021 Three-Year Plans term, National Grid (electric) implemented a solar PV inverter control offering as part of its new measure development efforts (Statewide Plan, Exh. 1, at 173; D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1-2).[86] As an initial matter, this proposed offering was not described in the National Grid (electric)'s 2019-2021 Three-Year Plan and does not align with the described purpose of the ADR initiatives in the 2019-2021 Three-Year Plan (i.e., reducing peak demand). Instead, National Grid (electric)'s solar PV inverter control offering meets the definition of a demonstration project (i.e., an offering designed to test whether a measure has the potential for measurable, cost-effective savings and benefits that can be scaled to be included in programs) and, therefore, National Grid (electric) should have sought Department approval prior to offering the measure. Guidelines, §§ 3.8.2; 3.9. Because National Grid (electric) has not received previous approval to implement this offering, the Department treats the proposal as a new offering. The Department will review the prudence of National Grid (electric)'s decision to spend

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86 National Grid (electric) acknowledges that it used "imprecise and potentially confusing language" to describe its efforts regarding the development of the solar PV inverter control measure (D.P.U. 21-128, Exh. DPU-Electric 2-4, at 1, citing Statewide Plan, Exh. 1, at 107, 173).

energy efficiency funds on a demonstration project without receiving Department authorization in the Term Report for its 2019-2021 Three-Year Plan.[87]

National Grid (electric) proposes this new solar inverter offering as a measure in the current Three-Year Plans term (Statewide Plan, Exh. 1, at 105, 173). As discussed below, there is not a sufficient record for the Department to approve the solar PV inverter control measure as proposed.

National Grid (electric) classifies the proposed offering as an ADR measure (Statewide Plan, Exh. 1, at 104-105). In particular, National Grid (electric) maintains that the intent of the measure is to improve the power factor on selected feeders in order to assess whether the improved power factor results in energy savings for all customers on the feeder and provides system benefits (Statewide Plan, Exh. 1, at 173; Tr. 3, at 499). The intent is not to dispatch the asset to achieve peak demand savings, like other ADR measures (see Tr. 3, at 506-508). National Grid (electric) further states that expected savings will vary based on the individual feeder characteristics (Tr. 3, at 500).

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87 The Department recognizes that Program Administrators may attempt to avoid applicable statutory requirements regarding pilots or Department standards regarding demonstration projects by labelling them "new measure development" or some other like name. The name a Program Administrator assigns to an activity is not determinative of whether or not it is a program, core initiative, pilot, or demonstration project. The Program Administrators must seek and receive all required approvals prior to implementing any project or measure that may constitute a demonstration project. Guidelines §§ 3.8.2, 3.9. Where the Program Administrator fails to do so, the Program Administrator risks disallowance of any related expenditures after a prudence review in the applicable Term Report.

Because the evaluation of savings for this measure will occur at the feeder level, the Department finds that National Grid (electric) has not adequately shown how the proposed measure (1) is an ADR measure or an energy efficiency measure,[88] and (2) differs from an electric distribution company's core function of regulating power quality (Statewide Plan, Exh. 1, at 105, 107, 173; Tr. 3, at 499-515). Based on this record, the Department cannot find that the proposed measure is appropriate as an energy efficiency offering.

In addition, the Department finds that the proposed solar PV inverter control measure is still nascent and not sufficiently developed to address the types of issues Sunrun appropriately raises (Statewide Plan, Exh. 1, at 105, 107, 173; D.P.U. 21-128, Exhs. DPU-Electric 2-4; DPU-Electric 2-5; Tr. 3, at 499-515; see also Sunrun Brief at 9-10). National Grid (electric) states that an evaluation study related to its implementation of this new measure development offering during the 2019-2021 Three-Year Plans term is being finalized and is expected to be completed by June 2022 (Tr. 3, at 505). After the completion of the evaluation study, if the Program Administrators wish to pursue solar PV inverter control as part of their energy efficiency programs, the electric Program Administrators may resubmit a detailed and fully supported solar PV inverter control proposal to the Department for review. See, e.g., NSTAR Electric Company/Western Massachusetts Electric Company, D.P.U. 16-178 (2017). Any such proposal must describe

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88 Energy efficiency measures should lower a customer's behind-the-meter energy consumption. ADR offerings include the dispatch of a behind-the-meter customer device that reduces peak demand, such as dispatchable Wi-Fi thermostats or battery systems. Solar inverters as described by National Grid (electric) do not meet either of these definitions.

how such an offering qualifies as an energy efficiency program and is distinguishable from core distribution functions.

Finally, the Department notes its concern about the issue of low power quality from distributed generation raised by National Grid (electric) (Tr. 3, at 513-514). The Department intends to explore this issue as part of its investigation into distributed generation interconnection and system planning. See Investigation by the Department of Public Utilities On Its Own Motion Into Electric Distribution Companies' (1) Distributed Energy Resource Planning and (2) Assignment and Recovery of Costs for the Interconnection of Distributed Generation, D.P.U. 20-75.

e. Lighting

The Program Administrators eliminated the residential lighting upstream program and in-unit direct install lighting for market rate customers (see, e.g., Exh. NG-Gas-2, at 87; Exh. DPU-Comm 2-4). The Program Administrators, however, propose to continue to offer lighting incentives to income-eligible participants through Income Eligible Coordinated Delivery, but plan to eliminate lighting offerings for renters (Statewide Plan, Exh. 1, at 63-64; Exhs. DPU-Comm 9-1; DPU-Comm 9-2).

The Program Administrators have an obligation to deliver programs in a cost-efficient manner, which may require the elimination of programs where market transformation has occurred and where program continuation is no longer a prudent use of ratepayer funds. However, the Program Administrators are also required to achieve all cost-effective energy efficiency. G.L. c. 25, § 21(b)(1). While DOER contends that lighting measures no longer

provide net savings, this fact is neither argued by the Program Administrators nor supported by the record in these proceedings (DOER Brief at 7; Statewide Plan, Exh. 1, at 59). Here, the Program Administrators argue that it is appropriate to eliminate nearly all lighting offerings because of the growth in LED market share and the purported diminishing cost-effectiveness of lighting measures relative to other energy efficiency measures (Exh. DPU-Comm 2-4). Nonetheless, the Program Administrators acknowledge that there are still opportunities to realize savings from lighting offerings, albeit at a lower level (Exh. DPU-Comm 2-4). For measures that have historically been offered by the Program Administrators and have remaining energy savings opportunities that can be cost-effectively achieved at the program level, the Program Administrators should continue to pursue those measures unless doing so is an imprudent use of ratepayer funds. For the reasons discussed below, the Department finds that the Program Administrators should not discontinue offering lighting measures to all residential customers.

The Program Administrators maintain that they intend to focus on delivering energy efficiency measures equitably to all customers in the implementation of their 2022-2024 Three-Year Plans (Statewide Plan, Exh. 1, at 17). While the Program Administrators have experienced significant success in serving customers, some customer segments (e.g., renters, moderate income, and limited English-proficiency) have historically participated in energy efficiency measures such as lighting to a lesser extent (Exh. DPU-Comm 2-8, Att. B). During this Three-Year Plan term, the Program Administrators intend to increase outreach to customers that have yet to participate in energy

efficiency measures (Statewide Plan, Exh. 1, at 17-23). Despite these stated intentions, the Program Administrators chose to terminate all lighting measures for residential customers knowing some customers have not been served, and prior to assessing the remaining savings opportunities for renters, moderate income, minority, and limited English-proficiency customers (Exh. DPU-Comm 9-2). The Department finds that these actions do not further the equitable service of customers.

Further, the Department is unpersuaded by arguments that eliminating lighting, which has limited remaining savings, will allow the Program Administrators to focus energy efficiency funding on long-term measures that will have a greater effect on the Commonwealth's emissions reduction goals. Energy efficiency is one of the most cost-effective means to lower emissions because reduced usage eliminates the need to decarbonize fuel sources. Additionally, under the 2022-2024 Three-Year Plans, the Program Administrators expect that their electrification efforts will lead to an increase in residential lifetime kWh consumption (Statewide Plan, Exh. 1, App. C.1-Electric (Rev.), Table IV.D.3.2.i). Increasing electricity consumption may increase energy and system costs, as well as require accelerated decarbonization efforts of the electric grid to avoid increasing GHG emissions. Continuing to pursue electric savings measures while electrifying the building sector can mitigate these impacts cost-effectively and provide energy savings to customers that have historically not participated in energy efficiency programs.

The Department agrees with CLF that the proposed elimination of lighting offerings for renters significantly reduces the availability and impact of energy efficiency measures that

are within a renter's control (CLF Brief at 25, citing Statewide Plan, Exh. 1, at 63-64). The Program Administrators are obligated to serve renters and the Department encouraged the Program Administrators to explore and implement strategies to better reach renters. 2019-2021 Three-Year Plans Order, at 43-44, 94-95. Eliminating one of the few measures that are within a renter's control and can provide energy savings, without first analyzing the impact on renters and other hard-to-reach customers, is inappropriate and may lead to inequitable outcomes.

The Program Administrators state that they would need to conduct a study to determine the cost-effectiveness of any offering prior to launching a renter-specific lighting program (Exhs. DPU-Comm 2-4; DPU-Comm 9-2). In response to a Record Request, the Program Administrators submitted a proposed scope of work for the evaluation, which involves four tasks: (1) a customer survey to understand purchasing habits of renters; (2) a literature review to examine the lifetime in-service rates and net-to-gross ratios from online store and kit-based lighting efforts; (3) a consensus process to set deemed adjusted measure lives, lifetime in-service rates, and net-to-gross ratios; and (4) the identification of future study needs to provide prospective updates to the measures' gross and net impacts (RR-DPU-4, Att. 1). The Department finds an evaluation is an appropriate means to inform a program design that will capture remaining lighting savings and, therefore, the Program Administrators shall conduct a study that assesses remaining lighting savings opportunities and strategies for renters, as well as moderate income, minority, and limited English-proficiency customers. The evaluation study should assess: (1) the projected

cost-effectiveness of a targeted lighting offering, and (2) pathways (e.g., direct install, upstream, midstream, or retail delivery models) that provide effective ways to reach renters, moderate income, minority, and limited English-proficiency customers. The Program Administrators shall file the final evaluation and implementation plan by September 30, 2022.

Although the Department accepts that measures may need to be discontinued over time as they become non-cost efficient, this decision must be made after full consideration of the Program Administrators' statutory mandate to pursue all cost-effective energy efficiency and to promote equity by targeting customers that historically have not participated in the measures. During the evaluation and development of a targeted lighting offering, the Program Administrators should continue to offer direct install lighting measures through its home energy audits within their Existing Buildings program under existing budgets.

f. Additional Measures Excluded from Statewide Plan

i. Cost-Effective Heating Equipment

The Program Administrators propose to eliminate certain cost-effective heating equipment, arguing that these measures no longer provide significant savings opportunities (Program Administrators Brief at 35, citing Exhs. DPU-Comm 10-12; DPU-Comm 13-10). Specifically, the Program Administrators propose to eliminate cost-effective propane and gas fired heating measures[89] and oil furnaces when the baseline is already a high-efficiency

[89] The Program Administrators state that gas furnaces going from a condensing baseline to an annual fuel utilization efficiency ("AFUE") of 97 are not cost effective (Exh. DPU-Comm 13-10(b)). The Program Administrators do not, however, propose to offer the following cost-effective measures: (1) condensing to condensing propane

condensing[90] unit (Statewide Plan, Exh. 1, at 11-12; Exh. DPU-Comm 10-12). The Program Administrators argue that it is unclear what level of incentive would be appropriate to influence a customer's decision to purchase the high efficiency equipment (Exh. DPU-Comm 10-12).

Excluding certain heating measures from these Three-Year Plans, particularly when participants would realize energy and cost savings, as well as lower GHG emissions from the cost-effective measures, calls into question whether the Program Administrators are fulfilling their statutory obligation to pursue all cost-effective energy efficiency resources (Exh. DPU-Comm 10-12). Cost-effective savings for limited fossil fuel heating are still available (Exh. DPU-Comm 10-12). A participant upgrading from a baseline condensing unit to a high-efficiency condensing unit could experience one MMBtu to 2.5 MMBtu in annual savings, in addition to thermostat savings of 2.1 MMBtu to 2.8 MMBtu, with incremental costs up to $1,034 (Exh. DPU-Comm 10-12). In addition, the savings associated with upgrading condensing fossil fuel heating systems to new condensing fossil fuel heating systems do not result in non-cost effective core initiatives or programs (Exh. DPU-Comm 13-10). Further, G.L. c. 25, § 21 contemplates the continuation of

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boilers; (2) condensing to condensing propane furnaces (95 AFUE and 97 AFUE); (3) condensing to condensing gas boilers; and (4) condensing to condensing gas furnaces (95 AFUE) (Exh. DPU-Comm 13-15(c)).

90 The Program Administrators state that they may offer incentives to customers who have condensing heating systems in limited income-eligible applications (Exh. DPU-Comm 13-13).

conversions from fossil fuel heating and cooling to fossil fuel heating and cooling, if the measure lowers energy consumption, lowers GHG emissions, and is cost effective without including social value of GHG emissions reductions in the calculation of benefits.

The Department fully supports the Program Administrators prioritization of heat pumps and encouraging adoption of low-carbon technologies through market transformation. However, as the Program Administrators have explained, some customers may face significant technical and financial hurdles to electrification of heating systems (Statewide Plan, Exh. 1, at 13). In addition, the Program Administrators have demonstrated that, at this time, fully displacing oil heat with a mini-split heat pump or a central heat pump, regardless of the installation cost, may actually increase lifetime operating costs by about $4,000 (see, e.g., Exh. NSTAR-Electric-2, Att. A). Pursuant to G.L. c. 25, § 1A, the Program Administrators must prioritize safety, equity, and affordability in implementing their programs. Accordingly, it is imperative that the Program Administrators ensure the subset of customers facing significant technical and financial hurdles to electrification are encouraged to adopt the most efficient, affordable heating system. This subset of customers should not be faced with costly home modifications and potentially higher energy costs if they prefer to install a more familiar heating measure and it is still cost effective to encourage the customer to adopt a higher efficiency, lower GHG-emitting heating system (Exh. DPU-Comm 10-1). Accordingly, the Department directs the Program Administrators to continue offering incentives for these cost-effective heating systems to participants so long as savings opportunities remain.

With regard to the Program Administrators' arguments regarding difficulty determining the appropriate incentive level, the Department notes that the Program Administrators have historically requested flexibility to set incentive levels based on multiple factors (see, e.g., Exh. NSTAR-Electric-2, at 112; see also D.P.U. 18-110 through D.P.U. 18-119, Program Administrators Brief at 16). Further, the Program Administrators conduct evaluation studies to assist in setting appropriate incentive levels (Statewide Plan, Exh. 1, App. I, Study 8). Using their expertise, the Program Administrators have been setting incentive levels for energy efficiency measures for well over a decade. Therefore, the Department directs the Program Administrators to use their knowledge, experience, and evaluation study results to identify an appropriate incentive level for these measures[91] and continue to offer incentives for these heating systems. The Department will review the Program Administrators' incentive level and offering in the Term Report proceeding.

ii. Residential Oil-fired Boilers

The Program Administrators propose to eliminate the residential oil-fired boilers measure, stating that it is no longer cost-effective because of the increase in efficient baselines (Statewide Plan, Exh. 1, at 79; Exhs. DPU-Comm 13-10; DPU-Comm 13-15(a); Tr. 1, at 89). Conversely, MEMA argues that heat pumps will not fully replace fossil-fueled heating systems in the next three years and, therefore, preserving existing rebates for

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91 The Department notes that incentive levels do not have to be set solely based on incremental costs (see Exh. DPU-Comm 10-12).

high-efficiency oil boilers and furnaces could immediately reduce GHG emissions and grid demand with the use of renewable biofuels (MEMA Brief at 2-4).

The Department notes that the Energy Act of 2018: (1) expanded the energy efficiency programs to include oil and propane measures; and (2) changed the cost-effectiveness analysis for energy efficiency to the sector level. St. 2018, c. 227 §§ 1, 6; see 2019-2021 Three-Year Plans Order, at 111 (Program Administrators expanded their programs to include cost-effective oil heat measures). Accordingly, non-cost effectiveness of an oil boiler measure is not determinative of whether a measure may be offered by a Program Administrator.[92]

In effectuating the requirements of the Green Communities Act, the Department must continue to ensure that the use of ratepayer dollars to fund energy efficiency programs and measures is justified by the benefits achieved. 2019-2021 Three-Year Plans Order, at 73. The Program Administrators state that oil boilers for residential customers do not have savings because the baseline is code.[93,94] Where the record does not demonstrate that there is

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92 Although the Climate Act determined that the social value of GHG emissions reductions should be applied on a measure-by-measure basis, the Climate Act did not repeal the Energy Act of 2018's requirement to screen cost-effectiveness at the sector level.

93 The Program Administrators plan to continue to offer oil boilers to income-eligible customers through the Income Eligible Coordinated Delivery Program (Statewide Plan, Exh. 1, at 79; Exh. DPU-Comm 13-10).

94 The Department notes that the TRM uses inconsistent baselines for early replacement measures (Statewide Plan, Exh. 1, App. O). Given the Department has only 90 days to review the Three-Year Plans, we are unable to fully investigate the discrepancies in

an energy savings opportunity, the Department finds that it is imprudent for the Program Administrators to use ratepayer funds to incent the measure.

iii. Biofuels

Regarding MEMA's argument advocating the use of biofuels to reduce emissions, the Program Administrators maintain that the use of biofuels does not lower energy consumption and, therefore, MEMA's proposal is inconsistent with the Green Communities Act (Program Administrator Reply Brief at 9, citing Tr. 1, at 76-77). Although biofuel is a potentially low-carbon renewable energy source, the Department agrees that, regardless of whether biofuels lower carbon emissions, the Green Communities Act requires the Program Administrators to pursue energy efficiency measures that lead to a reduction in energy consumption and lowers GHG emissions. G.L. c. 25, § 21(b)(1); Cape Light Compact JPE, D.P.U. 20-40, at 21 (2021).

The Department acknowledges that the availability of alternative low- or no-carbon fuels may affect the calculation of benefits for certain measures. For example, the Program Administrators appropriately take in to account the decarbonization of the electric grid in the calculation of electrification benefits (Statewide Plan, Exh. 1, at 8). The Department does not currently have enough information to conclude whether decarbonization of fuels is likely and consistent with the Commonwealth's energy policies. In this regard, the Governor

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the baselines. Accordingly, the Program Administrators shall file a detailed report fully explaining the method for the establishment of baselines for early replacement measures, including a detailed justification for any differences in baseline assumptions, by May 2, 2022.

recently established a special Commission on Clean Heat to develop a framework for long-term GHG emissions reductions from heating fuels. Executive Order No. 596, § 1 (September 9, 2021).[95] The Department expects that the Commission on Clean Heat and the resulting policy framework will provide additional guidance on the role of various resources in achieving the Commonwealth's net-zero emission targets.

iv. Combined Heat and Power

On April 30, 2021, the Program Administrators submitted to the Council a draft Statewide Plan as required by G.L. c. 25, § 21(c). On October 6, 2021, the Program Administrators submitted to the Council a second, revised draft Statewide Plan. Unlike the April 30th draft Statewide Plan, the October 6th draft Statewide Plan included a provision that would allow the Program Administrators to pursue CHP energy efficiency measures during the upcoming Three-Year Plans term (October 6th draft Statewide Plan § 3.8.6).[96] The CHP

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95 See Executive Order No. 596, § 1 (September 9, 2021). Available at: https://www.mass.gov/executive-orders/no-596-establishing-the-commission-on-clean-heat.

96 Section 3.8.6 of the October 6th draft Statewide Plan provides:

> For measures that use natural gas on site, such as [combined heat and power], the [Program Administrators] will pursue the use of renewable natural gas which is considered a zero emissions fuel. Following the current Renewable Portfolio Standard as an example, biogas or landfill gas would be considered renewable natural gas and it could either be generated on site or conveyed via a common carrier of natural gas from within the ISO-NE Control Area or an adjacent control area. Additionally, when possible, to capture the carbon from exhaust streams, the [Program Administrators] will encourage the customers to use or dispose of the CO_2 and those emissions will be backed out of the CO_2 calculations. While no projects of this nature have been identified and thus

measures would be required to use renewable natural gas (e.g., biogas or landfill gas) and comply with all applicable laws and policies (October 6th draft Statewide Plan § 3.8.6).

On October 25, 2021, the Program Administrators, DOER, and the Attorney General reached agreement on a Term Sheet.[97] With limited exceptions, the Term Sheet precludes the Program Administrators from considering CHP as an energy efficiency measure during the upcoming Three-Year Plans term (Statewide Plan, Exh. 1, App. M § IV.C.2).[98] Consistent with the Term Sheet, the Program Administrators did not include any renewable natural gas CHP proposals in the 2022-2024 Three-Year Plans filed with the Department on November 1, 2021.

As noted above, the April 30th draft Statewide Plan did not address renewable natural gas CHP. Five months after this draft was submitted to the Council, the Program Administrators added the renewable natural gas CHP provision to the October 6th draft

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budgeted for, if a customer can demonstrate that their project is cost effective, does not contribute to 2030 [greenhouse gas] emissions under the EEA methodology and delivers either MMBtu or electric demand savings, the [Program Administrators] will support these projects.

97 The Program Administrators included the Term Sheet as an attachment to their Three-Year Plan filings (Statewide Plan, Exh. 1, App. M).

98 Section IV.C.2 of the Term Sheet provides:

> The 2022-2024 [Three-Year] Plan phases out natural gas CHP incentives. No new natural gas CHP projects will be incentivized in 2022-2024 except for agreed upon, already committed CHP projects specified outside this Term Sheet. Any additional applications of CHP will only be established consistent with Commonwealth policies and if parameters are agreed upon in advance by DOER.

(Statewide Plan, Exh. 1, App. M § IV.C.2).

Statewide Plan.[99] Less than three weeks after submitting the October 6th draft Statewide Plan to the Council, the Program Administrators, DOER, and Attorney General reached agreement on the Term Sheet. Then, on November 1, 2021, the Program Administrators filed their Three-Year Plans with the Department for review; consistent with the Term Sheet, the Three-Year Plans do not contain any renewable natural gas CHP measures.

The Department notes that the various draft plans that go before the Council are not part of the filing here, so we will not decide whether to restore the specific language NECEC has requested. However, as we stated in Section IV.D., above, the Department is concerned that the Program Administrators are not fulfilling their statutory obligation to pursue all cost-effective energy efficiency resources by excluding certain measures from this Three-Year Plan. The Green Communities Act specifically identifies CHP as an energy efficiency measure, which has been included as a measure in prior Three-Year Plans. G.L. c. 25, § 19; 2010-2012 Electric Three-Year Energy Efficiency Plans, D.P.U. 09-116 through D.P.U. 09-120, at 25 (2010) ("2010-2012 Electric Three-Year Plans Order").

Because CHP is considered a custom measure, there may be instances where CHP projects meet all of the following criteria: (1) reduces net energy usage; (2) reduces GHG emissions; (3) screens cost-effective; and (4) complies with all applicable emission requirements and RPS eligibility requirements. Under the requirements of the Green Communities Act, CHP projects that use renewable natural gas and meet all these

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99 The Council's role in developing the Statewide Plan pursuant to G.L. c. 25, § 21(c) is described in Section III, above.

requirements meet the definition of an energy efficiency measure and, therefore, must be considered by the Program Administrators if the project screens as cost-effective.

As a final matter, the Department must address DOER's arguments about the purported significance of the Term Sheet as it relates to the programs to be implemented in the Three-Year Plans under the Green Communities Act. As noted above, DOER maintains that renewable natural gas CHP energy efficiency projects for the upcoming Three-Year Plans term are sufficiently addressed in the Term Sheet, which provides that such projects may be implemented by the Program Administrators only if the "parameters are agreed upon in advance by DOER" (DOER Reply Brief at 8, citing Statewide Plan, Exh. 1, App. M § IV.C.2). Regardless of any agreement memorialized in the Term Sheet,[100] DOER cannot define what constitutes all cost-effective energy efficiency under the Green Communities Act. Further, the Program Administrators may not purposely exclude established energy efficiency measures that are listed in the Green Communities Act and otherwise meet the requirements from the Three-Year Plans based solely on an agreement with another party. To the extent the Program Administrators develop parameters for implementing projects, these parameters

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[100] The Department supports the efforts of the Program Administrators, DOER, the Attorney General, and other stakeholders to resolve disputes prior to the Department's review of the Statewide Plan, particularly given the expedited review timeline set forth in the law. The Department must clarify, however, that the Term Sheet is not part of a Statewide Plan or the Program Administrators' Three-Year Plans. To the extent Program Administrators intend to include any elements addressed in a Term Sheet in their proposed Three-Year Plans, such elements must be fully set forth in the Three-Year Plan (i.e., Statewide Plan, Exh. 1) and supported by record evidence in order to be considered by the Department.

must be set forth in the Three-Year Plans where the Program Administrators have the burden to demonstrate that any proposed conditions meet all requirements set forth in the Green Communities Act.

4. Evaluation, Measurement, and Verification

EM&V is the systematic collection and analysis of information to document the impact and effect of energy efficiency programs, in terms of costs and benefits, and to improve their effectiveness. 2019-2021 Three-Year Plans Order, at 35; 2016-2018 Three-Year Plans Order, at 30; 2013-2015 Three-Year Plans Order, at 58; 2010-2012 Electric Three-Year Plans Order, at 125; 2010-2012 Gas Three-Year Energy Efficiency Plans, D.P.U. 09-110 through D.P.U. 09-115, at 115 (2010) ("2010-2012 Gas Three-Year Plans Order"). The Department's Guidelines require each Three-Year Plan to include an evaluation plan that describes how the Program Administrators will evaluate the energy efficiency programs during the term. Guidelines § 3.5.2; see also, G.L. c. 25, § 21(b)(2); 2019-2021 Three-Year Plans Order, at 36.

The Program Administrators propose a budget of $57.6 million to fund statewide EM&V activities during the Three-Year Plans term (Statewide Plan, Exh. 1, Apps. C.1 - Electric (Rev.) at 12; C.2 - Gas (Rev.) at 8). The Program Administrators' proposed EM&V framework includes the following elements: (1) four EM&V research areas (i.e., residential, C&I, demand, and special and cross-cutting); and (2) eight types of EM&V studies (i.e., impact evaluations, baseline studies, net-to-gross studies, market effects evaluations, NEI studies, cost and measure life studies, market characterization studies, and

process evaluations) (Statewide Plan, Exh. 1, at 178-179). In addition, the Program Administrators have created a strategic evaluation plan to identify evaluation priorities for the upcoming term and the Evaluation Management Committee will provide oversight of the EM&V activities (Statewide Plan, Exh 1, at 177-178).

The Program Administrators have demonstrated that their proposed EM&V framework is appropriate in terms of funding, scope, oversight, and planning (Statewide Plan, Exh. 1, at 176-180 & App. H). Accordingly, the Department finds that the proposed EM&V framework is consistent with the Green Communities Act, Department precedent, and Guidelines. G.L. c. 25, § 21(b)(2); Guidelines § 3.5. Further, because the Program Administrators have shown that EM&V efforts often apply to multiple programs, the Department approves the Program Administrators' proposal to allocate EM&V costs to a single line item under the hard-to-measure category (Statewide Plan, Exh. 1, at 179 & Apps. C.1-Electric (Rev.) at 12; C.2-Gas (Rev.) at 8).

5. Potential Studies

In 2019-2021 Three-Year Plans Order, at 38, the Department directed the Program Administrators to conduct a service territory-specific potential study using common definitions for the various levels of achievable potential and set a common study deadline to submit final potential study results. The Department finds that each Program Administrator conducted an energy efficiency potential study consistent with the Department's directives (Statewide Plan, Exh. 1, Apps. A at 11, F).

The Department recognizes that the implementation of the Climate Act, along with the EEA Secretary's Goal Letter dated July 15, 2021, introduced some uncertainty into the then-ongoing energy efficiency planning process. The Program Administrators state that if they are able to confirm a process for calculating GHG emissions factors and reductions sufficiently in advance of their submission of the April 30th draft Statewide Plan to the Council for the 2025-2027 Three-Year Plans term, they will work with their vendors to incorporate these calculations in future potential studies (Tr. 1, at 70-72). Given the need to construct a three-year plan to achieve the GHG emissions goal set pursuant to G.L. c. 21N, § 3B, the Department finds including an assessment of GHG emissions reduction potential in future potential studies is important to inform program design and provide an important objective measure of savings potential. See 2016-2018 Three-Year Plans Order, at 25. In regard to timing, the Department notes that going forward the EEA Secretary will set the GHG goals by March 1st, two months before the draft Statewide Plan must be filed with the Council which will allow the Program Administrators to incorporate the GHG information into future potential studies. G.L. c. 21N, § 3B. Accordingly, the Program Administrators shall implement GHG emissions reduction analyses in future potential studies, and specifically consider service-territory specific top-down GHG emissions reduction potential in setting their individual 2025-2027 Three-Year Plans goals.

E. Conclusion

For the reasons discussed above, the Department finds that the Program Administrators' Three-Year Plan goals are reasonable and consistent with the achievement of

all available cost-effective energy efficiency. Further, the Department finds that the Program Administrators have appropriately incorporated strategic enhancements to the residential and C&I programs that are designed to incorporate new technologies and address various barriers to participation in energy efficiency programs.

With the Department's revised criteria to identify Targeted Hard-to-Reach Communities, the Program Administrators can achieve a more equitable distribution of savings and benefits for a large number of environmental justice communities that face high participation barriers and historically low participation rates. Over this and future Three-Year Plan terms, the Department encourages the Program Administrators to continue to explore and implement strategies to better reach underserved populations and hard-to-reach customers, including renters and landlords, low- and moderate income customers, and limited English-proficiency customers.

V. ADMINISTRATIVE COSTS, COMPETITIVE PROCUREMENT, AND LOW-INCOME ALLOCATION

A. Introduction

In reviewing the Three-Year Plans, the Department is charged with ensuring that the Program Administrators have (1) minimized administrative costs to the fullest extent practicable and (2) used competitive procurement processes to the fullest extent practicable. G.L. c. 25, §§ 19(a), (b); Guidelines §§ 3.3.5, 3.3.6. Program Administrators must report program planning and administration PP&A expenditure broken down by: (1) internal costs; (2) external legal services; (3) assessments; (4) vendor services; and (5) sponsorships and subscriptions. D.P.U. 20-150-A at 11; Guidelines §§ 3.3.3(a). In addition, each Program

Administrator must demonstrate that it has allocated at least ten percent of the funds for electric energy efficiency programs and 20 percent of the funds for gas energy efficiency programs to the low-income sector. G.L. c. 25, § 19(c).

B. Program Administrators Proposal

1. Minimization of Administrative Costs

The electric Program Administrators propose to spend an average of 3.4 percent of their total energy efficiency expenditures on PP&A over the three-year term (Statewide Plan, Exh. 1, App. C.1 - Electric, Table IV.C.1 (Rev.)). The gas Program Administrators propose to spend an average of 3.7 percent of their total energy efficiency expenditures on PP&A over the three-year term (Statewide Plan, Exh. 1, App. C.2 - Gas, Table IV.C.1 (Rev.)). Each Program Administrator's PP&A costs as a percentage of total program expenditures for 2022 through 2024 are presented in the Gas and Electric Budget Comparison Tables (see, e.g., Exh. FGE-4, Table IV.C.2.2 (Rev.)).

2. Competitive Procurement

The Program Administrators propose to competitively procure the services of contractors and vendors to perform activities including, but not limited to, assessment delivery, quality control, rebate processing, monitoring and evaluation, potential studies, and marketing (Statewide Plan, Exh. 1, App. A at 23). The Program Administrators state that they will work collaboratively to ensure that these services have been competitively procured in a manner that minimizes costs to ratepayers, while maximizing the associated benefits of those investments (Statewide Plan, Exh. 1, App. A at 23).

3. Low-Income Program Budgets

Each Program Administrator included a table in its Three-Year Plan showing the percentage of its proposed energy efficiency program budget allocated to low-income programs (see, e.g., Exh. FGE (gas)-4, Table V.B (Rev.)). The electric Program Administrators project that they will spend, on average, 12.4 percent of the total energy efficiency program budget on low-income residential demand-side management and education programs over the Three-Year Plan term (Statewide Plan, Exh. 1, App. C.1 – Electric, Table V.B (Rev.)). The gas Program Administrators project that they will spend, on average, 20.6 percent of the total energy efficiency program budget on low-income residential demand-side management and education programs over the Three-Year Plan term (Statewide Plan, Exh. 1, App. C.2 – Gas, Table V.B (Rev.)). In addition, each Program Administrator projects that it will meet or exceed the applicable statutory minimum for low-income spending over the three-year term (see, e.g., Exh. FGE (gas)-4, Table V.B (Rev.)).

C. Positions of the Program Administrators

1. Minimization of Administrative Costs

The Program Administrators argue that they have minimized administrative costs to the fullest extent practicable (Program Administrators Brief at 52-57, citing Statewide Plan, Exh. 1, App. A at 20-23; Exh. DPU-Comm 4-1). In particular, the Program Administrators assert that they continue to participate in the statewide collaborative process that allows them to share costs that would otherwise be borne individually, resulting in economies of scale that

reduce costs for each Program Administrator (Program Administrators Brief at 53, citing Statewide Plan, Exh. 1, App. A at 21; Exh. DPU-Comm 4-1).

In addition, the Program Administrators maintain that, during the 2019-2021 Three-Year Plan term, they engaged the services of a vendor to conduct a Department-mandated study on the best practices for minimizing administrative costs ("PP&A Study Report") (Program Administrators Brief at 54, citing 2016-2018 Three-Year Plans Order, at 42).[101] The Program Administrators argue that they implemented all recommendations contained in the study and will continue to apply them to minimize administrative costs in the current Three-Year Plan term (Program Administrators Brief at 54, citing Statewide Plan, Exh. 1, App. A at 22-23; Exh. DPU-Comm 4-3).

No other party addressed the minimization of administrative costs on brief.

2. Competitive Procurement

The Program Administrators argue that they have used competitive procurement processes to the fullest extent practicable (Program Administrators Brief at 58-59, citing Statewide Plan, Exh. 1, App. A at 23). Specifically, the Program Administrators maintain that they have competitively procured the following services: (1) energy assessment delivery;

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101 The Program Administrators state that the study included recommendations in the following areas: (1) improved consistency in accounting practices; (2) streamlined reporting and data request process; (3) adherence to cost accounting best practices; (4) minimization of regulatory, collaboration, facilitation, reporting, and ad hoc request burden without compromising goal attainment; and (5) implementation of an annual process stress test (Program Administrators Brief at 54, citing Exh. DPU-Comm 2-8, Att. U).

(2) quality control; (3) monitoring and evaluation; (4) potential studies; and (5) marketing (Program Administrators Brief at 58, citing Statewide Plan, Exh. 1, App. A at 23).

Conversely, the Program Administrators assert that there are instances where competitive procurement of services is not appropriate or in the best interest of the Program Administrators or their customers, including, services that require special expertise, knowledge or complexity, unique statutory requirements, or cost of procurement (Program Administrators Brief at 58-59, citing Statewide Plan, Exh. 1, Apps. A at 23, App. C, Table V.D.1 (Rev.)).

No other party addressed competitive procurement on brief.

3. Low-Income Program Budgets

The Program Administrators maintain that they have each proposed a low-income program budget that meets or exceeds applicable statutory minimums over the Three-Year Plan term (Program Administrators Brief at 58, citing, e.g., Exh. BCG-4 (Rev.)). The Program Administrators assert that they have allocated the required percentage of the total Three-Year Plan term budget to the low-income residential sector (Program Administrators Brief at 57-58, citing Statewide Plan, Exh. 1, Apps. C.1 – Electric, Table V.B.1 (Rev.), C.2 – Gas, Table V.B.1 (Rev.)). Finally, the Program Administrators assert that they will continue to work collaboratively with LEAN to capture all available cost-effective energy efficiency in the low-income sector (Program Administrators Brief at 58, citing Statewide Plan, Exh. 1, at 108-115).

No other party addressed low-income program budgets on brief.

D. Analysis and Findings

1. Minimization of Administrative Costs

Consistent with Guidelines §§ 3.3.3, 3.3.5, each Program Administrator has included in its Three-Year Plan a description and supporting documentation of the steps it has taken to minimize administrative costs (Statewide Plan, Exh. 1, App. A at 23). As shown in the data tables (i.e., Budget Comparison Table-Three Year Plan vs. Previous Years, Section IV.C - Program Administrator Budgets), certain Program Administrators' PP&A costs remain relatively flat (i.e., EGMA, National Grid (electric)), with some increasing slightly (i.e., Berkshire Gas, Unitil (gas), National Grid (gas), Unitil (electric)) and others declining slightly (i.e., Liberty, NSTAR Gas, Compact, NSTAR Electric) as a percentage of its total budget in the current Three-Year Plan as compared to prior Three-Year Plans (see, e.g., Exh. FGE (gas)-4, Table IV.C.2.2 (Rev.)).

The Department notes, however, that planned PP&A costs for electric Program Administrators have increased significantly from the 2019-2021 Three-Year Plan to the 2022-2024 Three-Year Plan (Statewide Plan, Exh. 1, App. C.1 - Electric, Table IV.C.2.2 (Rev.)). The electric Program Administrators have proposed an increase of approximately $8.4 million (or 8.6 percent) in planned PP&A costs over the Three-Year Plans term (Statewide Plan, Exh. 1, App. C.1 - Electric, Table IV.C.2.2 (Rev.)). When comparing actual PP&A costs during 2019 (the first year of the 2019-2021 Three-Year Plans term) to planned PP&A costs for 2022 (the first year of the 2022-2024 Three-Year Plans term), the electric Program Administrators have proposed a $7.5 million (or a 30.9 percent) increase in

PP&A costs (c.f., Statewide Plan, Exh. 1, App. C.1 - Electric, Table IV.C.2.2, cells E75 and J75 (Rev.)). NSTAR Electric is the only electric Program Administrator to propose a decrease in planned PP&A costs; nonetheless, NSTAR Electric's planned PP&A costs represent an increase of approximately 32 percent between actual PP&A costs in 2019 and 2020 compared to planned PP&A costs in 2022 and 2023 (Exh. NSTAR-Electric-4 (Rev.), Table IV.C.2.2).

The gas Program Administrators have proposed an increase of approximately $13.2 million (or 40 percent) in planned PP&A costs over the Three-Year Plans term (Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.2.2 (Gas)). When comparing actual PP&A costs during 2019 (the first year of the 2019-2021 Three-Year Plans term) to planned PP&A costs for 2022 (the first year of the 2022-2024 Three-Year Plans term) the gas Program Administrators have proposed a $4.5 million (or a 48.8 percent) increase in PP&A costs (c.f., Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.2.2, cells E75 and J75). NSTAR Gas is the only gas Program Administrator to propose a decrease in planned PP&A costs; nonetheless, NSTAR Gas' planned PP&A costs still represent an increase of approximately 52 percent between actual PP&A costs in 2019 and 2020 compared to planned PP&A costs in 2022 and 2023 (Exh. NSTAR-Gas-4 (Rev.), Table IV.C.2.2).[102]

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[102] There are several data inconsistencies in the Program Administrators' energy efficiency data tables. For example, the total PP&A budgets included in Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.2.2) and Exh. 4, Table IV.C.2.2 (Rev.) do not match the total PP&A budgets identified in Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.1 and Exh. 4, Table IV.C.1 (Rev.). In Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.2.2, the Program Administrators

The Program Administrators did not provide any explanation for the increase in planned PP&A costs (see Statewide Plan, Exh. 1; Exhs. 2 (each Program Administrator's respective pre-filed testimony)). As discussed throughout this Order, the Program Administrators plan to undertake significant program enhancements and develop new program designs during the 2022-2024 Three-Year Plans term.[103] However, the Program Administrators propose significant enhancements in every Three-Year Plan. D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 13-15 (proposing energy optimization, program realignments, enhanced customer and ally support, tailored moderate income and renter offerings, new ADR initiatives, new municipal and community partnerships, new passive house and pay for savings offerings, low-income workforce development); D.P.U. 15-160 through D.P.U. 15-169, Statewide Plan, Exh. 1, at 13-15 (proposing a new renter-specific offering, new multi-family initiatives, new moderate income offering, expansion of upstream program, development of segment-specific outreach strategies, comprehensive review of small business initiative, development of online incentive application portal, development of multi-lingual marketing strategies). It is not clear from

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report a total statewide PP&A budget of $33,127,325, but in Statewide Plan, Exh. 1, App. C.2 – Gas (Rev.), Table IV.C.1, the Program Administrators indicate the budget is $46,034,325. As addressed in Section III, above, in order for the Department to conduct an efficient review of the Program Administrators' filings within the statutory 90-day review period, it is essential for the Program Administrators to provide accurate information in their filings.

[103] As discussed throughout this Order, all program and offering designs that the Program Administrators intend to implement during the Three-Year Plans term should be completely and fully described in the Three-Year Plan filings.

the record how or why these new enhancements proposed for the 2022-2024 Three-Year Plans term may increase PP&A costs more than in prior Three-Year Plans.

The Department acknowledges that the Program Administrators have historically taken steps to minimize administrative costs in the delivery of their energy efficiency programs. In this regard, the Program Administrators have shown that statewide collaboration in program planning, implementation, and evaluation contributes to economies of scale that reduce costs for each Program Administrator (Statewide Plan, Exh. 1, App. A at 23). 2019-2021 Three-Year Plans Order, at 50. The Department fully expects that this collaboration will continue throughout the 2022-2024 Three-Year Plans term.

Further, in 2016-2018 Three-Year Plans Order, at 42, the Department recognized that PP&A costs had substantially increased from the prior term and directed the Program Administrators to study best practices for such costs. The Program Administrators submitted the required PP&A Study Report as part of their 2019-2021 Three-Year Plans filing.[104] In the 2019-2021 Three-Year Plans Order, the Department directed the Program Administrators, as part of their 2019 Annual Reports, to adopt the recommendations of the PP&A Study Report and to provide the Department with an update of how those recommendations were adopted. 2019-2021 Three-Year Plans Order, at 50. The Program Administrators have implemented many of the recommendations in the PP&A Study Report, which has led to

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104 The Best Practices for Minimizing Program Planning and Administrative Cost for Massachusetts Utilities and Energy Efficiency Service Providers (October 25, 2018) filed in D.P.U. 18-110 through D.P.U. 18-119, Exh. 1, App. P (Statewide Plan, Exh. 1, App. A at 22).

minimization of certain administrative costs. See 2019 Energy Efficiency Plan-Year Reports, D.P.U. 20-50, App. 6, at 1-2. Specifically, the Program Administrators: (1) reviewed and updated accounting systems for consistency; (2) formalized and streamlined certain data reporting requests through the use of specific and limited plan-term Key Performance Indicators; and (3) established a cost review working group to oversee the implementation of best practices for cost allocation, tracking, and control, as well as the review of costs. See 2019 Energy Efficiency Plan-Year Reports, D.P.U. 20-50, App. 6, at 1-2. The Program Administrators state that they intend to continue each of the above efforts and have worked with the Council to establish agreed-upon Key Performance Indicators for the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 22-23; Exhs. BGC-2, at 104-105; EGMA-2, at 105-106; FGE (gas)-2, at 105-106; Exh. LU-2, at 103-104; NG-Gas-2, at 110-111; NSTAR Gas-2, at 105-106; Compact-2, at 102-103;FGE (electric)-2, at 100-101; NG-Electric-2, at 108-109; NSTAR-Electric-2, at 100-101).[105] Finally, the Program Administrators state that they will seek to minimize administrative costs by collaborating on reporting templates and using joint vendor services (Statewide Plan, Exh. 1, App. A at 22).

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105 The Key Performance Indicators are referenced in each Program Administrator's testimony and the Term Sheet but are not identified in the Three-Year Plans. Because the establishment of Key Performance Indicators is a key strategy to minimizing administrative costs during the Three-Year Plans term, going forward, the Program Administrators must include the specific proposed Key Performance Indicators in the Three-Year Plans. In their compliance filing, the Program Administrators shall provide the complete list of Key Performance Indicators for the 2022-2024 Three-Year Plans Term.

The Department finds that the proposed steps to minimize administrative costs, described above, are appropriate. The Program Administrators shall continue these efforts to minimize administrative costs over the course of this Three-Year Plans term.

A key recommendation from the PP&A Study Report was for the Program Administrators to formalize and seek to further streamline the reporting and data request process. PP&A Study Report at 18. As directed by the Department, in the 2019 Annual Reports, the Program Administrators provided a detailed explanation of the progress towards implementing each recommendation contained in the PP&A Study Report. See 2019 Energy Efficiency Plan-Year Reports, D.P.U. 20-50, App. 6, at 1-2. The Program Administrators stated that the formalized process for Key Performance Indicators was intended to create regular, known reporting obligations, and reduce ad hoc requests. 2019 Energy Efficiency Plan-Year Reports, D.P.U. 20-50, App. 6, at 1. The Program Administrators explained, however, that they continued to receive regular requests from many parties, including at the management committees and Council meetings. The Program Administrators indicated that they would continue to work with stakeholders on finding the right balance of providing information, using existing information, and understanding the purpose of a data request in order to minimize administrative costs where possible. 2019 Energy Efficiency Plan-Year Reports, D.P.U. 20-50, App. 6, at 1-2.

In our Order adopting revised Guidelines, the Department again directed the Program Administrators to implement the recommendations of the PP&A Study Report. We specifically directed the Program Administrators to work with the Council to develop a

formal process to address Council data requests in a way that balances the reporting of beneficial data/information and the minimization of administrative costs. D.P.U. 20-150-A at 12 n.9. The Department further directed the Program Administrators to include testimony in the Three-Year Plan filings describing a formal, agreed-upon process for how Council data requests will be made and responded to during this Three-Year Plans term. D.P.U. 20-150-A at 12 n.9; D.P.U. 21-120 through D.P.U. 21-129, Hearing Officer Procedural Memorandum at 2-3 (October 5, 2021).

Despite multiple Department directives, the Program Administrators failed to provide the formal, agreed-upon proposal for how Council data requests will be handled. Instead, in response to an information request issued by the Department, the Program Administrators submitted a draft proposal that had not yet been reviewed by the Council (Exh. DPU-Comm 4-1). On January 20, 2022, the Program Administrators finally submitted for Department review, a formal, agreed-upon process for how Council data requests will be addressed during this Three-Year Plans term (Exh. DPU-Comm 10-13 (Rev.) ("Council Data Request Process")).

The Program Administrators submitted the proposed Council Data Request Process more than five weeks after the close of the record in these proceedings and only eleven days before the Department is required by statute to issue this Order. Given the tardiness of the filing and the late stage of the proceeding, the Department is not able to review the adequacy of the Program Administrators' proposal at this time. With the exception of costs related to the six Key Performance Indicators currently reported for the 2019-2021 Three-Year Plans

term and the equity-related Key Performance Indicators referenced in each of the Program Administrator's testimony,[106] the Program Administrators will not be allowed to recover any administrative costs related to Council data requests or other Key Performance Indicators until such time as the Department has reviewed and approved the Council Data Request Process proposal. In the interim, the Program Administrators shall track all costs related to Council data requests and include them in their 2022 Annual Reports.

Based on a review of the Program Administrators' proposals to minimize administrative costs and conditioned on the adequacy of the Council Data Request Process, the Department finds that each Program Administrator's Three-Year Plan is designed to minimize administrative costs to the fullest extent practicable, consistent with the requirements of G.L. c. 25, §§ 19(a), (b). Going forward, in each Three-Year Plan filing and Term Report, the Program Administrators shall file testimony explaining the drivers of administrative costs and specific actions taken to minimize those costs. In the Term Report, the Program Administrators must demonstrate the specific actions they undertook during the 2022-2024 Three-Year Plan term to minimize administrative costs; a demonstration that the

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106 See Exhs. BGC-2, at 106; EGMA-2, at 107; FGE (gas)-2, at 106-107; LU-2, at 105; NG-Gas-2, at 111; NSTAR Gas-2, at 107; Compact-2, at 103; FGE (electric)-2, at 101; NG-Electric-2, at 109-110; NSTAR Electric-2, at 102.

Program Administrator underspent its PP&A budget will not be sufficient to meet this burden.[107]

2. Competitive Procurement

As noted above, each Program Administrator is required to demonstrate that it has used competitive procurement processes to the fullest extent practicable. G.L. c. 25, §§ 19(a), (b). The Department has consistently found that competitive procurement serves as a means of cost containment and provides an essential, objective benchmark for the reasonableness of the cost of services. 2013-2015 Three-Year Plans Order, at 152. In addition, competitive procurement keeps a consultant or an attorney with an established relationship with a company from taking that relationship for granted. 2013-2015 Three-Year Plans Order, at 152, citing Bay State Gas Company, D.P.U. 12-25, at 186 (2012); Fitchburg Gas and Electric Light Company, D.P.U. 11-01/11-02, at 236 (2011); New England Gas Company, D.P.U. 10-114, at 221 (2011).

For the 2022-2024 Three-Year Plans, each Program Administrator has competitively procured a high percentage of its program activities (ranging from 35 percent to 77 percent) (see, e.g., Exh. FGE-4 (Rev.), Table V.D). Where such procurements were used, the Program Administrators have demonstrated that they were done in a manner designed to

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107 The Department notes that the Program Administrators have collectively underspent their PP&A budgets in 2019 and 2020 (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.), Table IV.C.2.2; C.2 – Gas (Rev.), Table IV.C.2.2).

minimize costs to ratepayers (e.g., through the use of statewide solicitations and collaboration in the procurement of services) (Statewide Plan, Exh. 1, App. A at 23).

There are a limited number of areas where the Program Administrators have decided not to use competitive procurements to engage third-party energy efficiency services, such as special expertise, knowledge or complexity, unique statutory requirements, or cost of procurement (Program Administrators Brief at 58, citing Statewide Plan, Exh. 1, App. C (Rev.), Table V.D.1). The Program Administrators maintain that their decision not to competitively procure such services is appropriate for several reasons, including the complexity of issues and specialized knowledge required to address them (Program Administrators Brief at 59, citing Statewide Plan, Exh. 1, App. C (Rev.), Table V.D.1). The Department will not make any substantive findings on the reasonableness of the Program Administrators' decision not to competitively procure such services in this Order. Instead, at the time final cost recovery is sought, each Program Administrator will be required to present clear evidence showing cost containment and the reasonableness of the costs. See 2019-2021 Three-Year Plans Order, at 52.

The last issue notwithstanding, based on our review of the evidence presented, the Department finds that each Program Administrator's 2022-2024 Three-Year Plan is designed to use competitive procurement processes to the fullest extent practicable, consistent with the requirements of G.L. c. 25, §§ 19(a), (b) (see, e.g., Exh. FGE-4 (Rev.), Table V.D.1).

3. Low-Income Program Budgets

As shown in the Allocation of Funds, Low-Income Minimum Data, Tables V.B.1, each Program Administrator proposes a low-income program budget that meets or exceeds the statutory minimums over the Three-Year Plan term (see, e.g., Exh. FGE-4 (Rev.), Table V.B.1). Accordingly, the Department finds that each Program Administrator has satisfied the low-income budget requirements of G.L. c. 25, § 19(c).

E. Conclusion

Based on our review and subject to the conditions addressed above, the Department concludes that each Program Administrator's 2022-2024 Three-Year Plan is designed to minimize administrative costs and use competitive procurement processes to the fullest extent practicable, in compliance with G.L. c. 25, §§ 19(a), (b) and Guidelines §§ 3.3.5, 3.3.6. In each area where a Program Administrator has not competitively procured outside services, prior to final recovery, it will be required to present clear evidence demonstrating: (1) cost containment; and (2) that the cost of such services is reasonable. Finally, the Department finds that each electric and gas Program Administrator has planned to spend at least ten percent or 20 percent, respectively, of its proposed energy efficiency program budget on low-income demand-side management and education programs over the Three-Year Plans term, in compliance with G.L. c 25, § 19(c).

VI. COST EFFECTIVENESS

A. Introduction

The Department is required to review the Three-Year Plans for cost effectiveness. G.L. c. 25, § 21(b)(3). This review ensures that the Three-Year Plans are designed to capture energy savings and other benefits with values greater than costs. G.L. c. 25, § 21(b)(3). Under the Green Communities Act, as amended by the Energy Act of 2018, for the purpose of cost-effectiveness review, programs are aggregated by sector. G.L. c. 25, § 21(b)(3). The Department also requires the Program Administrators to report cost effectiveness at the program and core initiative level. D.P.U. 20-150-A at 6; 2019-2021 Three-Year Plans Order, at 74; 2013-2015 Three-Year Plans Order, at 105.

The Climate Act amended G.L. c. 25 to include a requirement that the Program Administrators must include the social value of GHG emissions reductions when determining cost effectiveness, and that calculation of program benefits shall include calculation of the social value of GHG emissions reductions, except in the cases of conversions from fossil fuel heating and cooling to fossil fuel heating and cooling. G.L. c. 25, §§ 19, 21(b)(3); D.P.U. 20-150-A at 7; Guidelines § 3.4.4. The AESC Study must now include an appropriate recommended social value of GHG emissions reductions for the Three-Year Plan benefit cost screening model. G.L. c. 25, §§ 19, 21(b)(3).

B. Program Administrators Proposal

1. Social Value of GHG Emissions Reductions

The Program Administrators propose a social value of GHG emissions reductions of $393 per short ton with a corresponding one percent discount rate based on the recommendation from the October 12, 2021 AESC Supplemental Study ("Supplemental Study") (Statewide Plan, Exh. 1, Apps. A at 16; Q, Study 3, at 5).[108,109] The AESC Study originally recommended a social value of GHG emissions reductions of $128 per short ton (Statewide Plan, Exh. 1, App. Q, Study 1, at 197). The Program Administrators state that, in light of the passage of the Climate Act, they entered into a new contract with the study author to update the recommended social value of GHG emissions reductions and convened a supplemental study group (Statewide Plan, Exh. 1, App. Q, Study 3, at 4; Exh. DPU-Comm 1-1, at 2). The Supplemental Study group recommended changing the discount rate from two percent to one percent, thereby changing the social value of GHG emissions reductions from $128 per short ton to $393 (Statewide Plan, Exh. 1, App. Q, Study 3, at 5).

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108 The Program Administrators use the AESC Study, completed on March 15, 2021 (amended on May 14, 2021), as well as the Supplemental Study to calculate benefits (Statewide Plan, Exh. 1, Apps. A at 15; Q, Studies 1 and 3).

109 The AESC Study is conducted on a three-year cycle and will be updated during the 2022-2024 term, with results applied in the 2025-2027 Three-Year Plan (Statewide Plan, Exh. 1, App. A at 16).

The Supplemental Study group provided the following reasons to support an updated social value of GHG emissions reductions: (1) the desire of the Program Administrators to ensure the proposed measures before the Department are based on the most up-to-date information; (2) the uncertainty surrounding the federally recommended social value of GHG emissions reductions and continuous need to review and update the value; and (3) comments from the federal Interagency Working Group ("IWG") tasked with issuing guidance on the social value of GHG emissions reductions, received in response to a technical support document released in advance of the IWG's comprehensive update expected in January 2022 (Statewide Plan, Exh. 1, App. Q, Study 3, at 4-5).[110] The Supplemental Study subsequently recommended the use of a one percent discount rate and the resulting revised value for the social value of GHG emissions reductions of $393 per short ton (Statewide Plan, Exh. 1, App. Q, Study 3, at 20).

2. Cost-Effectiveness Screening

The Program Administrators screened each sector, program, and core initiative for cost effectiveness using the Total Resource Cost ("TRC") test with a $393 per short ton social value of GHG emissions reductions (Statewide Plan, Exh. 1, App. A at 14-15).[111] The

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110 The current discount rate recommended by the IWG is three percent with a resulting social value of GHG emissions reductions of $49 per short ton (Statewide Plan, Exh. 1, App. Q, Study 3, at 6-7).

111 For the 2022-2024 Three-Year Plan, the Department directed the Program Administrators to calculate the BCR for each measure with and without the societal value of GHG emissions reductions in the BCR screening model. D.P.U. 20-150-A at 7 n.6.

Program Administrators state that the Statewide Plan and the Program Administrator-specific Three-Year Plans include cost-effective sectors and programs for each plan year and over the entirety of the 2022-2024 Three-Year Plans term (Statewide Plan, Exh. 1, App. A at 14-15; see, e.g., Exh. BGC-4 (Rev.), Table IV.D.1). At the Department's request, the Program Administrators also provided a revised cost-effectiveness analysis using the original social value of GHG emissions reductions of $128 per short ton (RR-DPU-3, Att. A, Table IV.D.1). Further, consistent with the Department's directives, the Program Administrators also provided a cost-effectiveness analysis without the social value of GHG emissions reductions (see, e.g., Exh. BGC-5 (Rev.)). D.P.U. 20-150-A at 7 n.6.

C. Positions of the Parties

1. Program Administrators

The Program Administrators argue that the change in social value of GHG emissions reductions from $128 per short ton to $393 per short ton is based on the Commonwealth's codification of GHG emission reductions in the Climate Act and reflects the "specific social climate urgency expressed by Massachusetts legislators" (Program Administrators Brief at 44-45; Exh. DPU-Comm 1-1, at 3). The Program Administrators assert that the Supplemental Study's recommended social value of GHG emissions reductions at $393 per short ton most accurately incorporates the Commonwealth's level of commitment to reducing GHG emissions and signals the importance of emissions reduction efforts to future generations (Program Administrators Brief at 45-46, citing Statewide Plan, Exh. 1, App. Q, Study 3, at 8-20; Exhs. DPU-Comm 1-1(c), (d); DPU-Comm 11-1(e); Tr. 2, at 279-280).

The Program Administrators claim that the AESC Study recognized that a change in the social value of GHG emissions reductions might be warranted as more information became available (Program Administrators Brief at 45, citing Statewide Plan, Exh. 1, App. Q, Study 1, at 198). The Program Administrators argue that the Supplemental Study, published in October 2021, uses the latest available information to conclude that $393 per short ton is the most accurate social value of GHG emissions reductions (Program Administrators Brief at 45, citing Statewide Plan, Exh. 1, App. Q, Study 3, at 5, 8-20).

The Program Administrators assert that employing the original social value of GHG emissions reductions of $128 per short ton in the cost-effectiveness analyses may necessitate broader revisions to the Three-Year Plans to ensure cost-effectiveness and GHG emissions reduction requirements are met (Program Administrators Brief at 46, citing Tr. 2, at 284; G.L. c. 25, §21(d)(4)). In this regard, the Program Administrators argue that using the $128 value will lead to lower benefit levels, which would reduce opportunities for cost-effective projects (including custom projects) (Program Administrators Brief at 46-47, citing Exh. DPU-Comm 8-1; RR-DPU-3). The Program Administrators assert these types of projects are critical to achievement of overarching Three-Year Plan goals and the equity commitments made by the Program Administrators, particularly in regard to small businesses (Program Administrators Brief at 47).

Finally, the Program Administrators claim that they have complied with cost-effectiveness screening requirements in developing the Three-Year Plans (Program Administrators Brief at 42, 48). Specifically, the Program Administrators argue that

consistent with Department precedent and Guidelines: (1) they have appropriately screened their Three-Year Plans for cost-effectiveness using the TRC test; and (2) all proposed programs, core initiatives, and sectors for the 2022-2024 Three-Year Plan term are cost-effective (Program Administrators Brief at 49, citing, e.g., Exh. BGC-5 (Rev.)). See D.P.U. 20-150-A at 4, 6-7; Guidelines §§ 3.4.3., 3.4.3.1.

2. Attorney General

The Attorney General argues that the Program Administrators' proposal, as filed, is supported by the Supplemental Study and, therefore, should be approved (Attorney General Brief at 15). The Attorney General argues that the AESC Study arrived at the initial $128 per short ton value, recognizing that this figure could be updated as more research was available and as study users monitored developments in this rapidly changing area (Attorney General Brief at 15-16). The Attorney General asserts that the requirements of the Climate Act prompted her, DOER, the Council, DEP, and the Program Administrators to reevaluate the $128 per short ton value and assess whether the analysis supporting that value was sufficiently vigorous and timely (Attorney General Brief at 16).

The Attorney General maintains that, should the Department disallow the Program Administrators' proposal to use the $128 per short ton value in their cost-effectiveness analyses, statewide benefits for the Three-Year Plans would decline by 29 percent, or roughly $4.0 billion (Attorney General Brief at 17). The Attorney General argues that this decrease in benefits would increase pressure on the overall cost-effectiveness of the Three-Year Plans, potentially cause the loss of certain measures, and would be inconsistent

with the Term Sheet or the Statewide Plan as approved by the Council (Attorney General Brief at 17).

3. Department of Energy Resources

DOER asserts that the Program Administrators appropriately incorporated the updated avoided costs from the Supplemental Study into their BCR models, including the adoption of a revised social value of GHG emissions reductions (DOER Brief at 22, citing Statewide Plan, Exh. 1, App. Q, Study 3). DOER argues that the Program Administrators properly valued the social value of GHG emissions reductions in the 2022-2024 Three-Year Plans and a social value of GHG emissions reductions of $393 per short ton based on a one percent discount rate meets the requirements of the Climate Act (DOER Brief at 14; DOER Reply Brief at 6-7).

DOER asserts that the AESC Study group initially recommended a $128 per short ton value with the proviso that this figure could change as new information became available (DOER Brief at 16). DOER explains that the recommissioned Supplemental Study group finding of $393 per short ton incorporates the most up-to-date information, reflecting the Commonwealth's commitment to climate goals as well as the urgency exhibited by lawmakers with the passage of the Climate Act (DOER Brief at 17-18).

DOER argues that the one percent discount rate aligns with the requirements of the Climate Act and is a prudent choice for Massachusetts (DOER Brief at 18-19; DOER Reply Brief at 6-7). In this regard, DOER asserts that the Climate Act calls for significant investments in decarbonizing the building sector, and lowering the discount rate to

one percent demonstrates the Commonwealth's commitment to reducing GHG emissions by appropriately valuing climate-mitigation investments (DOER Brief at 18). DOER also maintains that a low discount rate ensures that future environmental damage costs and benefits are appropriately valued (DOER Brief at 18). Lastly, DOER claims that the one percent social value of GHG emissions reductions discount rate is consistent with the 0.81 percent discount rate applied to all other avoided costs calculated by the AESC Study (DOER Brief at 18).

DOER argues that revising the social value of GHG emissions reductions to $128 per short ton would likely require the Program Administrators to revisit the Three-Year Plan structure and it to fall short of the priorities set by the EEA Secretary (DOER Brief at 19). In addition, DOER asserts that the $393 per short ton value is Massachusetts-specific, as opposed to the nationwide average value developed by IWG (DOER Brief at 20-21). DOER claims that, due to the Commonwealth's individual statutory obligations, a Massachusetts-specific figure is necessary (DOER Brief at 20-21). Lastly, DOER argues that the Massachusetts' statutory obligations may or may not align with upcoming federal guidance and, therefore, the Department should not delay the implementation of the $393 per short ton social value of GHG emissions reductions (DOER Brief at 21).

4. Acadia Center

Acadia supports the Program Administrators' proposed social value of GHG emissions reductions (Acadia Brief at 16-17). Acadia argues that using updated recommendation is critical to drive GHG emission reductions and most appropriately reflects the

Commonwealth's policy goals (Acadia Brief at 17). Further, Acadia claims that the AESC Study author noted the original social value of GHG emissions reductions was likely too low (Acadia Brief at 16-17, citing Statewide Plan, Exh. 1, App. Q, Study 3, at 20). Acadia maintains the Department should approve the lower one percent discount rate and the resulting higher social value of GHG emissions reductions in alignment with the expanded mandate of the Climate Act to prioritize equity and GHG emissions reductions (Acadia Brief at 17, citing G.L. c. 25, § 1A).

5. Conservation Law Foundation

CLF argues that the Department should prioritize GHG emissions reductions and analyze cost-effectiveness using the social value of GHG emissions reductions as proposed by the Program Administrators (CLF Brief at 47-48). In this regard, CLF argues that the proposed social value of GHG emissions reductions is "well-founded" (CLF Brief at 48).

CLF maintains that initial two percent discount rate does not appropriately account for the intergenerational nature of climate change (CLF Brief at 48-49). CLF further claims that the Supplemental Study's review of federal guidance and recent literature supports the Massachusetts-specific proposed social value of GHG emissions reductions (CLF Brief at 48-49). Finally, CLF maintains that the Program Administrators should be required to stay up-to-date on the most recent scientific reports on climate change in order to determine whether midterm increases in the scope of their electrification efforts may be appropriate based on changing conditions (CLF Brief at 49).

6. Northeast Clean Energy Council

NECEC supports the Program Administrators' use of a one percent discount rate and argues that the Department should approve the Program Administrators' proposal as the best available representation of the social value of GHG emissions reductions (NECEC Brief at 5). Further, NECEC argues that use of the proposed $393 per short ton social value of GHG emissions reductions is critical to support the Program Administrators' achievement of all cost-effective energy efficiency and GHG emissions reduction mandates (NECEC Brief at 5, 14-15).

D. Analysis and Findings

1. Introduction

The Department is required to review all energy efficiency programs contained in the Three-Year Plans for cost-effectiveness. G.L. c. 25, § 21(b)(3). This review ensures that programs are designed to capture energy savings and other benefits with values greater than costs. G.L. c. 25, § 21(b)(3). Under the Green Communities Act, as amended by the Energy Act of 2018, for the purpose of cost-effectiveness review, programs are aggregated by sector. G.L. c. 25, § 21(b)(3). Any sector with a BCR greater than 1.0 (indicating benefits are greater than costs) is considered cost effective. G.L. c. 25, § 21(b)(3). If a sector fails the cost-effectiveness screening, its component programs shall either be modified so that the sector meets the test or is terminated. G.L. c. 25, § 21(b)(3).

The Guidelines establish the method by which the Department determines cost effectiveness. Guidelines § 3.4. The Department evaluates cost effectiveness using the TRC

test, which includes all benefits and costs associated with the energy system and program participants. Guidelines § 3.4.3. A program or sector is cost effective if the cumulative present value of its benefits is equal to or greater than the cumulative present value of its costs.[112] Guidelines § 3.4.3.1. If a program or core initiative is not projected to be cost effective, the Program Administrator is not barred from implementing the program but is required to provide further documentation and explanation of how the program is a prudent use of ratepayer funds and how the Program Administrator intends to achieve cost-effective programs and core initiatives going forward. D.P.U. 20-150-A at 6.

The Climate Act expanded the benefits that may be included in a cost-effectiveness screening. D.P.U. 20-150-A at 7; G.L. c. 25, §§ 19, 21(b)(3). In calculating the TRC, program benefits shall include calculations of the social value of GHG emission reductions, except in cases of conversions from fossil fuel heating and cooling to fossil fuel heating and cooling. D.P.U. 20-150-A at 7; Guidelines § 3.4.4.

Each Program Administrator incorporated the social value of GHG emissions reductions developed by the AESC Supplemental Study into their BCR screening models (see, e.g., Exh. BGC-4 (Rev.), Table IV.D.3.1.i). The Department will first address the Program Administrators' proposed social value of GHG emissions reductions, and then will address cost-effectiveness screening.

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112 Benefits and costs are addressed in Guidelines §§ 3.4.4 and 3.4.5, respectively.

2. Social Value of GHG Emissions Reductions Valuation and Method

The Department has three concerns with the method the Program Administrators used to develop the proposed social value of GHG emissions reductions. First, the Department finds that there is a lack of record evidence supporting the revised social value of GHG emissions reductions and the embedded discount rate. Second, the Department does not accept the economic validity of the Program Administrators' argument that using the revised social value of GHG emissions reductions (and embedded one percent discount rate) better addresses the urgency of climate change. Finally, the Department has concerns regarding the process and timeline the Program Administrators used to develop the revised social value of GHG emissions reductions. The Department addresses each of these issues below. The Department also will consider whether adopting a different social value of GHG emissions reductions and discount rate would materially impact what measures, core initiatives, and programs would potentially be included or excluded from the Three-Year Plans.

The Program Administrators maintain that, in order to use the most up-to-date information, it was necessary to adopt the Supplemental Study group's findings, resulting in a change to the social value of GHG emissions reductions 13 business days before the Three-Year Plans were filed with the Department (Program Administrators Brief at 45, citing Statewide Plan Exh. 1, App. Q, Study 3, at 4-5, 8-20; Exhs. DPU-Comm 1-1; DPU-Comm 11-1). However, in order for the Department to rely on these benefits when assessing cost-effectiveness, the method of calculating avoided costs must be robust and

properly supported.[113] 2019-2021 Three-Year Plans Order, at 75; D.P.U. 08-50-A at 16; D.P.U. 11-120-A (Phase II) at 18. Here, the sum of the analysis performed in the Supplemental Study to develop the revised social value of GHG emissions reductions was a "literature review" of three documents: (1) public comments received in June 2021 by the federal working group; (2) the Climate Act, signed into law in March 2021; and (3) the EEA Secretary's July 15th letter setting GHG emissions reduction targets (Tr. 2, at 276; Statewide Plan Exh. 1, App. Q, Study 3, at 4-5, 7-20; Exhs. DPU-Comm 1-1(b); DPU-Comm 1-3; DPU-Comm 1-5; DPU-Comm 1-6(a); DPU-Comm 8-1; DPU-Comm 11-3). The Program Administrators admit that the literature review is not peer-reviewed research and did not contain any quantitative analysis (Tr. 2, at 282-283, 290-292; Exh. DPU-Comm 11-3).

In addition, the Department finds that the Supplemental Study group's literature review does not contain sufficient analysis to justify a change in the discount rate from two percent to one percent. The literature review included public comments from an IWG request for comments that explored various discount rates, including zero, one, two, three, five, and declining discount rates (Statewide Plan, Exh. 1, App. Q, Study 3, at 8 n.22, 15-20). Upon review, the Department finds little consensus in the literature outright supporting a one percent discount rate over a two percent discount rate; the two commenters that performed quantitative analysis on the study of discount rates, while noting that a

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[113] The Program Administrators must support the avoided cost value with evidence and must adequately explain how the value was derived. See 2019-2021 Three-Year Plans Order, at 75; D.P.U. 11-120-A (Phase II) at 18, citing Boston Gas Company v. Department of Telecommunications and Energy, 436 Mass. 233, 240-241 (2002).

one percent discount rate could be considered, explicitly recommend a discount rate above one percent (Statewide Plan, Exh. 1, App. Q, Study 3 at 5, 13, 15-20).[114] Further, the IWG currently recommends valuing the social value of GHG emissions reductions at $49 per short ton of CO_2e, with a corresponding discount rate of three percent (Statewide Plan, Exh. 1, App. Q, Study 3, at 6-7).

The AESC study group asserts that assigning more mathematical weight to low-probability, high-impact costs associated with climate change could substantially increase the social value of GHG emissions reductions (Statewide Plan, Exh. 1, App. Q, Study 3, at 7, 12-13). The Program Administrators did not, however, provide any evidence to show that incorporating low-probability, high-impact costs in the social value of GHG emissions reductions was appropriate, despite their assertion that the reason for convening the Supplemental Study group was to find a social value of GHG emissions reductions relevant to Massachusetts (Tr. 2, at 274-275; Statewide Plan Exh. 1, App. Q, Study 3, at 7, 12-13; Exh. DPU-Comm 1-2).

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[114] The New York State Department of Environmental Conservation recommends a two percent discount rate based on its study of federal research (Statewide Plan, Exh. 1, App. Q, Study 1 at 35, 191, 195-197; Study 3 at 8, 18). The Office of Management and Budget ("OMB") was the original source for the federal government's three percent discount rate recommendation in 2003, using data from 1973 to 2002 (Statewide Plan, Exh. 1, App. Q, Study 3 at 16). The Department notes that the Supplemental Study recalculated OMB's analysis using more recent data (i.e., 1991 to 2020) to arrive at a two percent discount rate (Statewide Plan, Exh. 1, App. Q, Study 3, at 16).

The Program Administrators and CLF claim that the two percent discount rate supported by the New York Department of Environmental Conservation does not accurately address the intergenerational nature of climate change in Massachusetts and that a one percent discount rate is more accurate for this purpose (Program Administrators Brief at 45-46; CLF Brief at 48-49). While our review of the literature in the record includes several sources that encourage consideration of a one percent discount rate, these sources do not demonstrate outright that a one percent discount rate more accurately reflects the intergenerational nature of climate change in Massachusetts than a two percent discount rate Statewide Plan Exh. 1, App. Q, Study 3, at 15-18; Exhs. DPU-Comm 14(b), (c); DPU-Comm 15(c), Att. B, at 23; DPU-Comm 16; DPU-Comm 11-3).[115] The fact that the AESC Study notes that the social value of GHG emissions reductions may change as more information becomes available, is not reason enough to support the proposed change when the new information does not definitively recommend a one percent discount rate over a two percent discount rate (Statewide Plan, Exh. 1, App. Q, Study 3, at 8, 16, 18).

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115 The Program Administrators cite to comments made by 14 Attorneys General (including in New York and Massachusetts) regarding the discount rate and its impact on generational valuation (Exh. DPU-Comm 1-5(c), Att. B at 22-23). The Department finds however, that the Program Administrators take these comments out of context. The comments support general "consideration" of a discount rate lower than two percent, but advocate specifically for the federal government (which employs complex statistical modeling that the Program Administrators do not have access to) to update its guidance on the social value of GHG emissions reductions (Tr. 2, at 290-292; Exhs. DPU-Comm 1-5(c), Att. B, at 22-23; DPU-Comm 11-3; DPU-Comm 11-4(b)). In addition, the New York Department of Environmental Conservation concluded that the appropriate discount rate would be closer to two percent (Exh. DPU-Comm 1-5(c), Att. B at 22).

Next, the Department takes issue with the Program Administrators' proffered economic rationale to support the revised social value of GHG emissions reductions. Conceptually, the social value of GHG emissions reductions quantifies the avoided costs society would otherwise bear from CO_2, methane, and other GHG emissions reductions and applies a discount rate to forecast these avoided costs into the future (Statewide Plan, Exh. 1, App. Q, Study 1, at 193).[116] All else being equal, a lower discount rate elicits a higher social value of GHG emissions reductions (Statewide Plan Exh. 1, App. Q, Study 3, at 15). The initial, lower $128 per short ton value reduces the same amount of GHG emissions for the Commonwealth as the higher proposed value because the value does not impact program design or implementation in any structural way, nor does it result in any core initiatives, programs, or sectors becoming non-cost effective (Tr. 2, at 280-281, 283-290; RR-DPU-3, Att. A, Table IV.D.1; Exh. DPU-Comm 8-2). Accordingly, the Department finds that regardless of whether the social value of GHG emissions reductions is $128 per short ton or $393 per short ton, the measures and programs offered by the Program Administrators will not change because the programs remain cost effective.

The Program Administrators claim that a primary reason to change the social value of GHG emissions reductions is to recognize the added priority of GHG emissions reduction as

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116 By incorporating a social value of GHG emissions reductions in the BCR screening model, measures that reduce GHG emissions are valued higher (in dollars) over the course of their useful lives than if the social value of GHG emissions reductions was not included in the model (Statewide Plan Exh. 1, App. A at 8, 15-16).

set forth in the EEA Secretary's July 2021 letter[117] and the Climate Act (Tr. 2, at 278-280; Program Administrators Brief at 44-46; Exhs. DPU-Comm 1-1; DPU-Comm 1-4; DPU-Comm 8-1; DPU-Comm 11-1; DPU-Comm 11-3). While the Program Administrators had a statutory mandate to incorporate a social value of GHG emissions reductions for Three-Year Plan measure benefits, the Climate Act did not require that the Program Administrators adopt a specific social value of GHG emissions reductions or discount rate (Tr. 2, at 277-279). Accordingly, the Program Administrators' proposal is not an interpretation of a statutory mandate. The purpose of social value of GHG emissions reductions as set forth in the Climate Act is to incorporate the avoided costs of carbon into measure benefits, not to reduce marginal GHG emissions (Tr. 2, at 280-281, 283; Statewide Plan, Exh. 1, App. A at 15-16). Guidelines § 3.4.4.

Finally, the Department is concerned about the Program Administrators' apparent disregard for the AESC Study group process, which resulted in a last-minute revision to the Statewide Plan mere weeks before the Three-Year Plans' filing deadline. The Department has previously endorsed the AESC Study group process and this process is key to producing a reliable social value of GHG emissions reductions to include in the Three-Year Plans. See 2019-2021 Three-Year Plans Order, at 68. Following this transparent, stakeholder-centered process, which concludes before April 30th of the year the Three-Year Plans are filed with

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117 The EEA Secretary set the 2030 GHG emissions reduction goals for gas and electric Three-Year Plan measures at 341,000 and 504,000 metric tons, respectively (Statewide Plan, Exh. 1, App. D at 3).

the Department, is critical to validate the study group's findings (Statewide Plan, Exh. 1, App. A at 16). However, in changing the proposed social value of GHG emissions reductions and discount rate a mere 13 business days before the Three-Year Plans were filed with the Department, the Program Administrators and AESC Study group effectively bypassed the process the Department has previously endorsed as essential to produce accurate assumptions of avoided costs. See 2019-2021 Three-Year Plans Order, at 68. By bypassing this process, the Program Administrators cannot credibly show that the findings in the Supplemental Study were the result of a careful, stakeholder-driven analysis. In fact, the Program Administrators admitted that no quantitative analysis was performed during the course of the Supplemental Study (Tr. 2, at 290-292; Exh. DPU-Comm 11-3).

The Department expects the AESC Study group process will produce appropriate and reliable avoided cost figures based on quantitative analysis, which will provide base assumptions for how to quantify benefits of every Three-Year Plan measure. See 2019-2021 Three-Year Plans Order, at 68. The AESC Study group stakeholder approach, which includes the Attorney General, DOER, several energy agencies in neighboring states, and other interested parties (e.g., consumer and environmental advocacy organizations) should ensure as much consistency and transparency as is feasible. See 2019-2021 Three-Year Plans Order, at 68. But when the Supplemental Study revised the social value of GHG emissions reductions from $128 per short ton to $393 per short ton approximately two weeks before the Program Administrators were required to file the

2022-2024 Three-Year Plans with the Department, we are unable to find that the findings in the Supplemental Study are credible.

The AESC Study is conducted before the draft Statewide Plan is submitted to the Council on April 30th in order to give the Program Administrators enough time to finalize their proposals using the avoided cost assumptions from the study. G.L. c. 25, §§ 21(b)(1), (c). Despite the fact that the Supplemental Study was finalized only 13 business days before the Three-Year Plan filing deadline and after the October 6th draft Statewide Plan was submitted to the Council, the Program Administrators maintain that the cost effectiveness of core initiatives and programs would need to be re-assessed in the event that the social value of GHG emissions reductions was reverted back to $128 per short ton (Tr. 2, at 286-289; Exh. DPU-Comm 8-2). Given the timeline above and the evidence that using the $128 per short ton value does not result in non-cost effective core initiatives, programs, or sectors in the Three-Year Plans filed with the Department, the Department is skeptical about the Program Administrators' suggestion that the implementation changes are required to meet the Green Communities Act's statutory cost-effectiveness requirement, unless the Program Administrators are claiming that their planned benefits and costs are not accurate. The Department notes that the Program Administrators were unable to identify any change that was made to the Three-Year Plans from the October 6th draft Statewide Plan that were added due to the proposed higher social value of GHG emissions reductions and if they were not removed from the programs would result in non-cost effective programs (Tr. 2, at 285-287, 290; Exh. DPU-Comm 8-2). To address this concern, the Department requested that the

Program Administrators provide recalculated BCR screening models using the AESC Study-derived $128 per short ton social value of GHG emissions reductions (Tr. 2, at 288-290). The data the Program Administrators provided here did not render any core initiatives, programs, or sectors non-cost effective (RR-DPU-3, Att. A, Table IV.D.1). Accordingly, contrary to the Program Administrators' assertions, the Department finds that the lower claimable benefits associated with the initial $128 per short ton social value of GHG emissions reductions will not fundamentally alter the Three-Year Plans as filed (Tr. 2, at 284, 286, 289; Program Administrators Brief at 46-47; see also Attorney General Brief at 17; DOER Brief at 19).

The Program Administrators seek to increase planned statewide benefits from approximately $9.2 billion to $12.9 billion with the proposed social value of GHG emissions reductions as filed (Exh. DPU-Comm 8-1). While a marginal $3.7 billion in statewide benefits is significant, the Department can only consider this addition to statewide benefits if it accompanied by contextual and quantitative support in the record. 2019-2021 Three-Year Plans Order, at 75; D.P.U. 08-50-A at 16; D.P.U. 11-120-A (Phase II) at 18. In this regard, the Department finds that the revised social value of GHG emissions reductions was derived only through a non-peer-reviewed literature review, was not the product of any quantitative analysis, will not address climate change any more urgently than the original social value of GHG emissions reductions, and was not developed through the formal AESC Study group process. For these reasons, the Department denies the Program Administrators'

proposal to change the social value of GHG emissions reductions from $128 per short ton as derived by the AESC Study to $393 per short ton from the Supplemental Study.

The Program Administrators shall continue to evaluate the appropriate social value of GHG emissions reductions in all future AESC studies that are overseen by the AESC Study group. Going forward, however, the Department will not consider avoided cost supplemental studies completed after the April 30th deadline for inclusion in the BCR screening model. Accordingly, the Program Administrators shall incorporate the AESC Study findings submitted by April 30th of the filing year in all future three-year plan filings.

3. Cost-Effectiveness Screening

The Department finds that, incorporating a $128 per short ton social value of GHG emissions reductions, the BCR for all core initiatives, programs, and sectors for each Program Administrator's Three-Year Plan remain cost effective and, therefore, no changes to the program designs included in the 2022-2024 Three-Year Plans are required (Tr. 2, at 286-289; RR-DPU-3, Att. A, Table IV.D.1). The cost-effectiveness analyses submitted using the $128 per short ton social value of GHG emissions reductions, however, did not include the December 21, 2021, updates to the Program Administrators' BCR screening model and energy efficiency data tables (Statewide Plan, Exh. 1, App. C (Rev.)). In its compliance filing, each Program Administrator shall refile its BCR screening model and all associated data tables to incorporate the $128 per short ton social value of GHG emissions reductions.

4. Conclusion

As discussed above, the Department finds that the most appropriate social value of GHG emissions reductions to represent the avoided costs of the Commonwealth's reduced GHG emissions is $128 per short ton of CO_2e based on available data and the AESC Study.[118] After review, the Department finds that each Program Administrator demonstrated that its Three-Year Plan includes cost-effective sectors and programs for each plan year and over the entire 2022-2024 Three-Year Plan term.

VII. PERFORMANCE INCENTIVES

A. Introduction

The Green Communities Act provides that the Three-Year Plans shall include a proposed mechanism that provides incentives to the Program Administrators based on their success in meeting or exceeding the plan goals. G.L. c. 25, § 21(b)(2). Section 3.6.2 of the Department's Guidelines outlines principles for the design of a performance incentive mechanism. Pursuant to the Guidelines, an incentive mechanism must achieve the following: (1) be designed to encourage Program Administrators to pursue all available cost-effective energy efficiency; (2) be designed to encourage energy efficiency programs that will best achieve the Commonwealth's energy goals; (3) be based on clearly defined goals and activities that can be sufficiently monitored, quantified, and verified after the fact; (4) be

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118 As discussed above, the AESC Study is conducted on a three-year cycle and will be updated during the 2022-2024 Three-Year Plan term, with results applied in the 2025-2027 plans (Statewide Plan, Exh. 1, App. A at 16).

available only for activities in which the Program Administrator plays a distinct and clear role in bringing about the desired outcome; (5) be as consistent as possible across all electric and gas Program Administrators; and (6) avoid any perverse incentives. Guidelines § 3.6.2. Further, the Guidelines specify that the amount of funds available for performance incentives should be kept as low as possible to minimize the costs to electricity and gas customers, while still providing appropriate incentives for the Program Administrators. Guidelines §§ 3.6.2, 3.6.3.

B. Program Administrators Proposal

1. Performance Incentive Mechanism

The Program Administrators[119] propose to implement a performance incentive mechanism for each year of the Three-Year Plan term (Statewide Plan, Exh. 1, Apps. A at 25-26; C.1 - Electric (Rev.); C.2 - Gas (Rev.); S.1 - Electric (Rev.); S.2 – Gas (Rev.)). The Program Administrators propose a statewide incentive pool equal to $131.8 million for the electric Program Administrators and $38.2 million for the gas Program Administrators (Statewide Plan, Exh. 1, App. A at 27).

The Program Administrators submit that the proposed incentive mechanism uses a benefits-based construct similar in form to that of the prior performance incentive model approved by the Department for the 2019-2021 Three-Year Plans' term (Statewide Plan,

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119 The Compact does not receive a performance incentive. D.P.U. 08-50-A at 51. Accordingly, all references to "Program Administrators" in this section do not include the Compact.

Exh. 1, App. A at 25-26). For the 2022-2024 Three-Year Plans term, however, the Program Administrators propose a new performance incentive mechanism structure, comprised of the following: (1) an equity component; (2) an electrification component; and (3) a standard component, which accounts for all residual portfolio benefits (Statewide Plan, Exh. 1, App. A at 26-27). Additionally, the Program Administrators propose to discontinue the value component, stating that including a value component would disincentivize them from targeting the potentially more costly equity and electrification measures (Statewide Plan, Exh 1, App. A at 26).[120]

The Program Administrators propose to collect performance incentive dollars through each component at predetermined common payout rates, subject to thresholds and caps (Statewide Plan, Exh. 1, Apps. A at 26-27; S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The threshold and cap levels are calculated based on design level performance, which is defined as 100 percent of a Program Administrator's projected benefits and net benefits (Statewide Plan, Exh. 1, App. A at 24 n.81). As discussed further below, the proposed payout rates, thresholds, and caps vary for each component, but are the same for each gas Program Administrator and for each electric Program Administrator for each year of the Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 27; S.1 - Electric (Rev.); S.2 - Gas (Rev.)).

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120 The Program Administrators state that they do not propose to include an ADR savings component, which was approved for the electric Program Administrators in the 2019-2021 Three-Year Plans' term because the market for these offerings is no longer nascent (Statewide Plan, Exh. 1, App. A at 25-26).

The Program Administrators propose a total portfolio cap of 125 percent of design level performance for the total possible performance incentive earned (Statewide Plan, Exh. 1, App. A at 27). The Program Administrators do not propose to set individual incentive caps for either the equity component or the electrification component; instead, the proposed incentive payouts for each component are subject to the total portfolio cap (Statewide Plan, Exh. 1, App. A at 27). Additionally, the Program Administrators propose to cap incentive payouts for the standard component at 125 percent of design level performance until the thresholds for both the equity and the electrification components are met (Statewide Plan, Exh. 1, App. A at 27).

Finally, the Program Administrators submit that in order to align with the 2022-2024 Three-Year Plan goals, along with the Commonwealth's goals under the Climate Act, they propose not to apply the marginal abatement cost benefits to fossil fuel measures for the purposes of calculating performance incentives (Statewide Plan, Exh. 1, App. A at 26). The Program Administrators assert that, while these costs are still included for purpose of assessing cost-effectiveness, removing the marginal abatement cost benefits of fossil fuel measures from performance incentive calculations ensures that electrification measures take priority over fossil fuel measures (Statewide Plan, Exh. 1, App. A at 26; Tr. 3, at 421-422).

2. Equity Component

The Program Administrators propose to allocate approximately $15.0 million for gas and $23.8 million for electric from the statewide incentive pool to a new equity component of

the performance incentive mechanism (Statewide Plan, Exh. 1, Apps. A at 27; S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The Program Administrators state that the proposed payout rate for the equity component was determined by dividing the portion of the performance incentive pool allocated to the equity component by the planned statewide benefits from eligible equity measures (Statewide Plan, Exh. 1, App. A at 28).

The Program Administrators calculated the proposed equity component payout rates for the electric and gas Program Administrators at $0.0173 and $0.0136, respectively (Statewide Plan, Exh. 1, Apps. S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The Program Administrators propose to implement one common payout rate for the electric Program Administrators that is 20 percent higher than the electric standard component payout rate and one common payout rate for the gas Program Administrators that is 55 percent higher than the gas standard component payout rate (Statewide Plan, Exh. 1, App. A at 28).

The proposed threshold for achieving an incentive through the equity component is 85 percent of planned portfolio equity benefits (Statewide Plan, Exh. 1, App. A at 27, 28). The Program Administrators explain that this threshold level will ensure growth in achievement of equity benefits beyond those achieved during the 2017-2019 term, when normalized for measures being offered in the 2022 2024 term (Statewide Plan, Exh. 1, App. A at 28). The Program Administrators propose that, upon meeting the threshold, they will begin to earn a performance incentive (Statewide Plan, Exh. 1, App. A at 28). The Program Administrators propose not to cap performance incentives from the equity and electrification components as long as the total performance incentive for a Program

Administrator does not exceed 125 percent of the total portfolio design level (Statewide Plan, Exh. 1, App. A at 27, 28).

The Program Administrators explain that the purpose of the equity component is to provide an incentive for the Program Administrators to achieve benefits in 38 Targeted Communities,[121] and for moderate-income customers statewide, including benefits achieved from electrification measures[122] (Statewide Plan, Exh. 1, App. A at 28). The Program Administrators state that the 38 Targeted Communities were determined using a method designed to target municipalities that are a priority for investment in energy efficiency based on criteria related to: (1) income; (2) minority or English isolation; and (3) historically low past participation in energy efficiency programs (Statewide Plan, Exh. 1, App. A at 28; Exh. DPU-Comm 3-3).

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121 As discussed further in Section IV.B.2.a.iv. above, the Program Administrators identified 38 communities as "environmental justice" communities that will be prioritized for energy efficiency investment (Statewide Plan, Exh. 1, at 21). The Program Administrators state that they have not defined specific equity measures eligible for incentives under the equity component (Exhs. DPU-Comm 3-1; DPU-Comm 3-3). Instead, the Program Administrators propose that benefits from any installed measure, including moderate-income and electrification measures (but excluding those installed by medium and large commercial customers), in one of the 38 Targeted Communities, will be counted towards the equity component performance incentive (Exh. DPU-Comm 3-1).

122 To avoid the double counting of benefits, the Program Administrators propose to classify electrification measures that also qualify as equity measures as equity measures (Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-3; Tr. 3, at 418-419).

3. Electrification Component

The Program Administrators propose to allocate approximately $2.8 million for gas and $37.6 million for electric from the statewide incentive pool to a new electrification component of the performance incentive mechanism (Statewide Plan, Exh. 1, Apps. A at 27; S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The Program Administrators state that the proposed payout rate for the electrification component was determined by dividing the portion of the performance incentive pool allocated to the electrification component by the planned statewide benefits from eligible electrification measures (Statewide Plan, Exh. 1, App. A at 29).

The proposed payout rate of the electrification component for the electric and gas Program Administrators is $0.0173 and $0.0136, respectively (Statewide Plan, Exh. 1, Apps. S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The Program Administrators propose one common payout rate for the electric Program Administrators that is 20 percent higher than the electric standard component payout rate and one common payout rate for the gas Program Administrators that is 55 percent higher than the gas standard component payout rate (Statewide Plan, Exh. 1, App. A at 29).

The proposed threshold for achieving an incentive through the electrification component is 60 percent of planned portfolio electrification benefits (Statewide Plan, Exh. 1, App. A at 29; S.1 - Electric (Rev.); Tr. 3, at 401-404).[123] The Program Administrators

[123] The Program Administrators alternately identify the proposed threshold for the electrification component at 50 percent in Statement Plan, Exh. 1, App. A at 27 and

explain that this proposed threshold level ensures that they achieve a minimum level of electrification benefits for customers prior to receiving any performance incentives, and also accounts for the large uncertainty and scale of electrification goals (Statewide Plan, Exh. 1, App. A at 29).

The Program Administrators state that the purpose of the electrification component is to provide an incentive for the Program Administrators to accelerate the adoption of eligible measures and achieve benefits from electrification measures outside of the 38 Targeted Communities or moderate-income customers statewide (Statewide Plan, Exh. 1, App. A at 29).[124]

4. Standard Component

The Program Administrators propose to allocate approximately $20.3 million for gas and $70.4 million for electric from the statewide incentive pool to a new standard component of the performance incentive mechanism (Statewide Plan, Exh. 1, Apps. A at 27; S.1 - Electric (Rev.); S.2 - Gas (Rev.)). The Program Administrators state that the purpose of the standard component is to provide an incentive for the Program Administrators to

60 percent in Statewide Plan, Exh. 1, App. A at 29. During evidentiary hearings, the Program Administrators verified that the proposed threshold is 60 percent (Tr. 3, at 401).

[124] To avoid the double-counting of benefits, the Program Administrators propose to count any electrification measures within the 38 Targeted Communities or for moderate-income customers under the equity component and not the electrification component (Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-3 Tr. 3, at 418-419).

achieve portfolio benefits that do not fall under the equity and electrification components (Statewide Plan, Exh. 1, App. A at 29). The proposed payout rate for the standard component was determined by dividing the portion of the performance incentive pool allocated to the standard component by the planned statewide benefits from eligible standard component measures (Statewide Plan, Exh. 1, App. A at 29). The proposed payout rate for the standard component for the electric and gas Program Administrators is $0.0144 and $0.0087, respectively (Statewide Plan, Exh. 1, Apps. S.1 - Electric (Rev.); S.2 - Gas (Rev.)).

Under the proposal, the threshold for achieving an incentive through the standard component is either 75 percent of planned standard component benefits or the statewide weighted portfolio threshold (Statewide Plan, Exh. 1, App. A at 27, 29; Tr. 3, at 403). The Program Administrators propose to establish the weighted portfolio threshold statewide by first calculating the summed threshold value of benefits for each component and subsequently dividing the total threshold benefits by the total planned benefits (Statewide Plan, Exh. 1, App. A at 29). Using this method, the Program Administrators propose to establish a weighted portfolio threshold of 73 percent for the electric Program Administrators and 77 percent for the gas Program Administrators (Statewide Plan, Exh. 1, App. A at 29-30).

5. Discontinuation of Value Component

The Program Administrators propose to discontinue the value component to (1) help avoid conflicting incentives and (2) promote achievement of electrification measures and equitable access to programs (Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-16,

at 2-3). The Program Administrators state that if the value component is preserved, it could provide a disincentive for them to target equity and electrification measures, given the higher cost of these measures relative to those included under the standard component (Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-16, at 2-3). Upon the Department's request in discovery, the Program Administrators submitted a revised exemplar performance incentive mechanism that included a value component (Exh. DPU-Comm 3-16, Att.).

C. Positions of the Parties

1. Program Administrators

The Program Administrators assert that its proposed performance mechanism is consistent with the Department's standards for the design of performance incentives and, therefore, should be approved (Program Administrators Brief at 68, 79-80). The Program Administrators claim that the proposed incentive structure supports the Commonwealth's energy and climate goals by targeting equity- and electrification-related benefits (Program Administrators Brief at 78).

In addition, the Program Administrators claim that it is necessary to discontinue the value component so that they have an incentive to target the potentially more costly equity and electrification measures (Program Administrators Brief at 68-69, citing Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-16(a), (b)). The Program Administrators assert that the significant increase in the scope and scale of the programs in these Three-Year Plans, including a marked increase of electrification measures, results in greater uncertainty in determining planned costs compared to past plans (Program Administrators Brief at 69, citing

Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-16(a)). Therefore, the Program Administrators contend that a value component may either reward the Program Administrators for initially over-estimating planned costs or unduly penalize them should initial cost estimates for large C&I electrification projects prove insufficient to achieve targeted reductions (Program Administrators Brief at 69, citing Statewide Plan, Exh. 1, App. A at 26; Exh. DPU-Comm 3-16(a)). The Program Administrators maintain that the Council, Attorney General, and DOER support removal of the value component (Program Administrators Brief at 69, citing Statewide Plan, Exh. 1, App. A at 26).

The Program Administrators contend that setting a total portfolio-level cap, rather than individual caps for each of the three components, will allow for flexibility over the Three-Year Plan term and across sectors, while encouraging the Program Administrators to achieve savings where they exist to reach portfolio goals and avoid split incentives (Program Administrators Brief at 78). The Program Administrators also argue that there are no perverse incentives or double counting of benefits with their proposal because each component has a distinct benefit pool and a separate subset of the total portfolio benefits (Program Administrators Brief at 78, citing Statewide Plan, Exh. 1, App. A at 28-29). Finally, the Program Administrators assert that their cost-effectiveness models include sufficient information to enable the Program Administrators to appropriately monitor, quantify, and verify each measure and incentive dollar earned without double counting (Program Administrators Brief at 78-79, citing Guidelines § 3.6.2(c)).

2. Attorney General

The Attorney General submits that the proposed three-component performance incentive approach better encourages achievement of equity and electrification priorities and complies with Department precedent and regulatory principles (Attorney General Brief at 21). Additionally, the Attorney General supports elimination of the value component, maintaining that it would provide a disincentive for the Program Administrators to undertake the increased investment necessary to achieve the electrification and equity priorities (Attorney General Brief at 23, citing Exh. DPU-Comm 3-16; Tr. 3, at 388-390). Further, the Attorney General asserts that the intended purpose of the value component (i.e., minimizing costs to achieve benefits) is realized through other mechanisms, such as reporting and mid-term modification requirements (Attorney General Brief at 23-24, citing Exh. DPU-Comm 3-16(b); Tr. 3, at 290-291; Guidelines § 3.8). The Attorney General, therefore, recommends that the Department approve of the performance incentive mechanism as proposed (Attorney General Brief at 24).

Finally, the Attorney General recommends that if the Department requires inclusion of the value component in the performance incentive mechanism, it consider alternative approaches to the value mechanism design from prior plans (Attorney General Reply Brief at 2). In this regard, the Attorned General maintains that DOER's recommendation that the Department apply the value component individually to each of the three benefit categories, rather than at the total portfolio level, is an appropriate alternative (Attorney General Reply Brief at 2).

3. Department of Energy Resources

DOER argues that the proposed performance incentive mechanism (1) complies with the Climate Act, (2) is needed to ensure the Three-Year Plans deliver all necessary GHG emissions reduction and equitable outcomes, and (3) is consistent with the Department's Guidelines and precedent (DOER Brief at 28, 30). DOER submits that the equity component supports the proposed program implementation approach of using geographically targeted community partnerships to increase awareness, participation, and equitable distribution of benefits (DOER Brief at 31). Further, DOER argues that the three-component mechanism appropriately addresses the new Climate Act requirements and ensures the Three-Year Plans will target the Commonwealth's electrification and equity priorities (DOER Brief at 33).

Additionally, DOER asserts that the removal of the value component is appropriate given the Climate Act requires the Program Administrators to prioritize achieving benefits at the lowest-cost but also to consider the new electrification and equity goals (DOER Brief at 33-34). Specifically, DOER contends that the benefits associated with equity and electrification are expected to come at a higher cost than those associated with the standard component (DOER Brief at 34, citing Statewide Plan, Exh. 1, App. A at 26). Moreover, DOER argues that a value component is not necessary because there are already mechanisms in place to minimize costs, such as regular reporting and the inherent motivation for utilities to minimize energy efficiency related bill impacts for their customers (DOER Brief at 34-35).

DOER argues that if the Department determines a value component is a necessary cost containment mechanism, it should approve distinct value components for each of the three component pools, rather than applying the value component to the portfolio as a whole (DOER Brief at 35; DOER Reply Brief at 5). DOER contends that having three distinct value components will provide an incentive for the Program Administrators to achieve the new Three-Year Plan priorities at the lowest cost and will avoid a performance incentive mechanism that provides an incentive for the pursuit of lower-cost energy efficiency measures in affluent communities over energy efficiency measures in historically underserved communities (DOER Brief at 35-36). Further, if the Department retains the value component, DOER recommends reducing its weight compared to past plans (DOER Brief at 35; DOER Reply Brief at 5). DOER argues that the applied weight should be lower than the 20 percent allocation offered by the Program Administrators in response to the Department's discovery request for an exemplar performance mechanism that included a value component (DOER Brief at 35, citing Exh. DPU-Comm 3-16, Att.).

4. Acadia Center

Acadia argues that the structure of the proposed performance incentive mechanism, including the new components related to equity and electrification, meet statutory criteria and the Department's Guidelines (Acadia Brief at 21-22). Acadia asserts that the three proposed incentive components do not suffer from the same design defects as the renter component rejected by the Department in the 2019-2021 Three-Year Plans (Acadia Brief at 23, citing 2019-2021 Three-Year Plans Order, at 93-95). Specifically, Acadia argues that the Program

Administrators have: (1) designed the incentive mechanism in such a way that the savings and benefits pools do not cross; (2) proposed specific threshold targets that must be met to collect a performance incentive; and (3) proposed an incentive that encourages the Program Administrators to undertake activities they normally would not (Acadia Brief at 23-24).

Additionally, Acadia contends that the equity component is designed to provide an appropriate incentive for the Program Administrators to reach traditionally underserved populations (Acadia Brief at 24). Finally, Acadia argues that the electrification incentive is necessary for gas Program Administrators because electrification runs counter to the gas utility business model (Acadia Brief at 27). Specifically, Acadia maintains that as more consumers electrify, the gas Program Administrators will lose customers and associated revenues, and the opportunity to earn returns on expanded gas infrastructure (Acadia Brief at 27).

5. Conservation Law Foundation

CLF submits that an equity component is necessary to ensure that the Program Administrators appropriately prioritize equity and justice in the implementation of their Three-Year Plans (CLF Brief at 43). Further, CLF asserts that the equity component is a positive development that will help the Program Administrators increase access for environmental justice communities and underserved individuals (CLF Brief at 45).

D. Analysis and Findings

1. Introduction

The Green Communities Act provides that the Three-Year Plans shall include a proposed incentive mechanism. G.L. c. 25, § 21(b)(2). As described above, the Program Administrators propose a performance incentive mechanism that is different than the one approved by the Department for the 2019-2021 Three-Year Plans term (Statewide Plan, Exh. 1, App. A at 25-26). Specifically, the Program Administrators propose a new performance incentive structure comprised of an equity component, an electrification component, and a standard component (Statewide Plan, Exh. 1, App. A at 23-31). The Program Administrators do not propose to include a value component (Statewide Plan, Exh. 1, App. A at 23-31). Additionally, the Program Administrators propose to cap incentives at the total portfolio level rather than setting an individual cap for each component (Statewide Plan, Exh. 1, App. A at 27).

2. Performance Incentive Mechanism

a. Statewide Incentive Pool

The electric Program Administrators propose a statewide performance incentive pool of approximately $131.8 million (Statewide Plan, Exh. 1, App. S.1 - Electric (Rev.)). The gas Program Administrators propose a statewide performance incentive pool of approximately $38.2 million (Statewide Plan, Exh. 1, App. S.2 - Gas (Rev.)).

Performance incentives should provide an appropriate level of shareholder reward for the successful implementation of a Three-Year Plan. Accordingly, the performance incentive

pool should reflect the effort the Program Administrators must undertake to encourage the pursuit of all cost-effective energy efficiency. In addition, the Department finds that, similar to its standard for setting a fair and reasonable return on equity, we may exercise discretion in considering various factors to determine the appropriate level of performance incentives, including qualitative factors such as compliance with the Green Communities Act and Department directives, the reviewability and reliability of filings, customer service, and management performance. See, e.g., NSTAR Gas Company, D.P.U. 21-GREC-06, at 26-27 (2021); Boston Gas Company, D.P.U. 20-120, at 437-438 (2021); NSTAR Gas Company, D.P.U. 19-120, at 406-408 (2020); Boston Gas Company and Colonial Gas Company, D.P.U. 17-170, at 308-309 (2018).

In 2019-2021 Three-Year Plans Order, at 88-89, the Department approved a statewide incentive pool equal to approximately six percent of the electric Program Administrators' budgets for each year (before taxes) and approximately three percent of the gas Program Administrators' budgets for each year (before taxes). In the instant Three-Year Plans, the proposed statewide incentive pool is approximately 4.7 percent of the electric Program Administrators' budgets for each year (before taxes) and approximately 3.1 percent of the gas Program Administrators' budgets for each year (before taxes) (Statewide Plan, Exh. 1, App. A at 28; C.1 - Electric (Rev.); C.2 - Gas (Rev.)).[125]

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[125] The electric and gas Program Administrators' proposed budgets for the Three-Year Plans term are substantially larger in comparison to the budgets approved in the 2019-2021 Three-Year Plans term (Statewide Plan, Exh. 1, Apps. C.1 – Electric (Rev.) at 14; C.2 – Gas (Rev.) at 9). Although the proposed performance incentive

The Department finds that the proposed statewide incentive pool, as a percentage of Program Administrators' budgets, is consistent with the statewide incentive pool in previous three-year plans (Statewide Plan, Exh 1, Apps. C.1 - Electric (Rev.); C.2 - Gas (Rev.)). 2019-2021 Three-Year Plans Order, at 88-89. Nevertheless, the Department must take into account the deficiencies of the Program Administrators' Three-Year Plan filings and other issues discussed in Section III, above, which have impacted the reviewability and reliability of the filings, as well as the Department's ability to conduct an efficient but thorough review of the Three-Year Plan filings within the 90-day statutory review period. Given the deficiencies and compliance issues discussed above in Section III, the Department will reduce the proposed incentive pool for each gas and electric Program Administrator by ten percent. See, e.g., Milford Water Company, D.P.U 12-86, at 274-276 (2013); D.P.U. 08-27, at 71, 137-138 (2009).

After review, subject to the mandated reductions to the proposed gas and electric statewide incentive pools, the Department finds that the funds available for performance incentives have been kept as low as possible, while still providing appropriate incentives for the Program Administrators (see Statewide Plan, Exh. 1, Apps. S.1 - Electric (Rev.); S.2 - Gas (Rev.); Guidelines §§ 3.6.2, 3.6.3).

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pools are consistent with the incentive pools in the 2019-2021 Three-Year Plans as a percentage of total proposed budget, this alone is not per se indicative that the funds available for performance incentives have been kept as low as possible, especially given the substantial increase in proposed budgets between plans.

b. Equity Component

The Program Administrators propose to add a new equity component to the performance incentive mechanism and allocate funds from the statewide incentive pool to this effort (i.e., 23.8 million for electric and 15.0 million for gas) (Statewide Plan, Exh. 1, App. A at 27). The Program Administrators maintain that the purpose of the new equity component is to provide an incentive to achieve benefits in the 38 Targeted Communities identified in Section IV.B.2.a.iv., above (Statewide Plan, Exh. 1, at 21 & App. A at 28). The Program Administrators further argue that, absent a targeted equity component, the Three-Year Plans would fail to adequately support the Commonwealth's energy and climate goals (Program Administrators Brief at 78, citing Guidelines § 3.6.2(b)). The Attorney General and other parties support the adoption of the equity component (Attorney General Brief at 21; DOER Brief at 28, 33; 36-37; Acadia Brief at 21-22; CLF Brief at 43).

The Department finds that the addition of an equity component will encourage the Program Administrators to pursue all cost-effective energy efficiency in an equitable manner. However, the Program Administrators have not defined any specific measures as "equity measures" (Exhs. DPU-Comm 3-1; DPU-Comm 3-3). Pursuant to the Guidelines, a performance incentive mechanism must be based on clearly defined goals and activities that can be sufficiently monitored, quantified, and verified after the fact. Guidelines § 3.6.2. The Program Administrators bear the risk that the Department may reject requested incentive payments if performance cannot be verified easily and objectively. D.P.U. 13-67, at 9-10 &

n.19 (2014). Without distinct equity measures, the Department finds that the specific goals of the equity component are not sufficiently defined and, as a result, the Department cannot adequately monitor, quantify, and verify the Program Administrators' performance as it relates to equity. Accordingly, the Department directs each Program Administrator to provide the following information in its compliance filing: (1) revised Energy Efficiency Data Tables identifying specific equity measures and their associated planned savings, costs, and benefits at the measure level, which must be readily distinguishable from savings, costs (including allocated costs), and benefits for the savings and electrification components; and (2) a detailed description of the method the Program Administrators will use to track the success of each equity measure at the ZIP code level.

Further, pursuant to the Department's directives in Section IV.D.3.a.ii, above, the Department finds that the equity component should provide an incentive for Program Administrators to pursue all cost-effective energy efficiency from customers in municipalities with environmental justice communities that also have historically lower participation rates. Accordingly, the Program Administrators shall apply the benefits achieved from the Targeted Hard-to-Reach Communities that meet the criteria outlined in Section IV.D.3.a.ii, above, towards the equity component of the performance incentive mechanism. The Program Administrators shall also apply the benefits achieved from moderate-income customers statewide as well as benefits achieved from electrification measures in the Targeted Hard-to-Reach Communities discussed above, through the equity component.

The Department accepts that significant effort will be required to develop strategies to address participation barriers that can successfully deliver energy efficiency benefits to historically lower-served customer groups and communities (Statewide Plan, Exh. 1, at 65-70). After review, the Department finds that the equity component, as modified herein, will provide an appropriate incentive for the Program Administrators to overcome participation barriers and undertake activities that they would not otherwise undertake absent a performance incentive. 2019-2021 Three-Year Plans Order, at 96; D.P.U. 13-67, at 10. Additionally, the Department finds that the equity component is designed to encourage the pursuit of all cost-effective energy efficiency opportunities, wherever available. G.L. c. 25, §§ 19(a), 19(b), 21(a), 21(b)(1), 21(b)(2), 21(d)(2); Guidelines § 3.6.2. The threshold for achieving a performance incentive through the equity component shall be 85 percent of planned benefits for this component. Subject to the above directives, the Department approves the modified equity component of the proposed performance incentive mechanism.

c. Electrification Component

The Program Administrators propose to add a new electrification component to the performance incentive mechanism and allocate funds from the statewide incentive pool to this component (i.e., $37.6 million for electric Program Administrators and $2.8 million for gas Program Administrators) (Statewide Plan, Exh. 1, App. A at 27). The Program Administrators maintain that the purpose of the new electrification component is to provide an incentive to the Program Administrators to achieve benefits from strategic electrification measures that are not in the 38 Targeted Communities or for moderate-income customers

statewide (Statewide Plan, Exh. 1, App. A at 29). The Attorney General, DOER, and Acadia support the adoption of the electrification component (Attorney General Brief at 21; DOER Brief at 28; Acadia Brief at 21-22). Specifically, Acadia argues that the electrification component is necessary for gas Program Administrators because strategic electrification runs counter to the gas utility business model (Acadia Brief at 26-27).

The Program Administrators indicate that some unidentified strategic electrification measures are not eligible under the electrification component (Statewide Plan, Exh. 1, App. A at 29).[126] Pursuant to the Guidelines, a performance incentive mechanism must be based on clearly defined goals and activities that can be sufficiently monitored, quantified, and verified after the fact. Guidelines § 3.6.2. As discussed in Performance Metrics, D.P.U. 13-67, at 9-10 n.19 (2014), the Program Administrators bear the risk that the Department may reject requested incentive payments if performance cannot be verified easily and objectively. Without distinct, qualified electrification measures, the Department finds that the specific goals of the electrification component are not sufficiently defined and, as a result, the Department cannot adequately monitor, quantify, and verify the Program Administrators' performance as it relates to electrification as defined under this component. Accordingly, each Program Administrator shall provide the following information in its required compliance filing: (1) revised Energy Efficiency Data Tables identifying specific

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126 As discussed above, the Department has modified the criteria for the equity component and, therefore, electrification measures installed in any of the communities that meet the modified criteria are not eligible for the electrification component.

electrification measures and their associated planned savings, costs (including allocated costs), and benefits at the measure level, which must be readily distinguishable from savings, costs (including allocated costs), and benefits for the savings and equity components; and (2) a detailed description of the method the Program Administrators will use to track the success of each strategic electrification measure at the ZIP code level.

With the required modifications addressed above, the Department finds that the addition of an electrification component to the proposed performance incentive mechanism is consistent with the Commonwealth's energy policies. The Department accepts that significant efforts will be required to develop strategies and train a workforce during this term to deliver strategic electrification measures consistent with G.L. c. 25, § 21(b)(2) (Statewide Plan, Exh. 1, at 14). After review, the Department finds the proposed electrification component, as modified above, is appropriately designed to overcome barriers in the nascent market for fuel conversions (see Tr. 3, at 363-364). 2019-2021 Three-Year Plans Order, at 96. However, as proposed, the Department finds that the electrification component contains insufficient safeguards to ensure that it will not provide a perverse incentive for the Program Administrators to pursue electrification without prior weatherization and the right-sizing of cooling and heating equipment in order to increase claimable benefits with a higher payout rate.[127]

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[127] Weatherization ensures that customers installing heat pumps are well positioned to increase the overall energy efficiency of their heat pump, while mitigating bill impacts. Weatherization also reduces energy demand on the electric grid, thereby improving reliability and reducing the need for infrastructure upgrades. Right-sizing

To address this design flaw, the Department finds that it is necessary to make the payout of performance incentives in the electrification component contingent upon weatherization. Specifically, in order to earn performance incentives in the electrification component, a Program Administrator will be required to verify that the customer has weatherized prior to or within six months after the installation of a heat pump. The Department also expects the Program Administrators to ensure that heat pump installers are properly trained on program requirements, quality installation, and right-sizing prior to these contractors providing strategic electrification service to customers (Statewide Plan, Exh. 1, at 83).

In their required compliance filings, the Program Administrators shall include a detailed description of how they will track customer weatherization and heat pump installation at the ZIP code level. In addition, prior to the end of the 2022-2024 Three-Year Plan term, the Program Administrators shall undertake an evaluation study comparing energy usage, costs, and comfort level for customers that did and did not weatherize prior to or after heat pump installation. The evaluation study must include a discussion of comparative bill impacts for each case. With these required modifications, the Department finds that the proposed electrification component is otherwise consistent with the principles established by

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cooling and heating equipment ensures that a system is properly sized for a customer's needs, which improves efficiency, reduces operating costs, reduces noise, and improves comfort.

the Department for the design of a performance incentive mechanism. 2019-2021 Three-Year Plans Order, at 96; D.P.U. 13-67, at 8-15.

Finally, the Department finds that the electrification component, as modified herein, is constructed in such a way to encourage the pursuit of all cost-effective energy efficiency opportunities, consistent with the Green Communities Act. G.L. c. 25, §§ 19(a), 19(b), 21(a), 21(b)(1), 21(b)(2), 21(d)(2); Guidelines § 3.6.2. The threshold for achieving a performance incentive through the electrification component shall be 85 percent of planned benefits for this component. Subject to the modifications required above, the Department approves the electrification component of the proposed performance incentive mechanism.

d. Standard Component

The Program Administrators propose to include a redesigned standard component in the proposed performance incentive mechanism and allocate funds from the statewide incentive pool to this component (i.e., $70.4 million for the electric Program Administrators and $20.3 million for the gas Program Administrators) (Statewide Plan, Exh. 1, App. A at 27). The Program Administrators state that the standard component is designed to provide them with an incentive to achieve benefits in the areas not covered under the electrification and equity components (Statewide Plan, Exh. 1, App. A at 29).

The Program Administrators propose to exclude marginal abatement cost benefits associated with fossil fuel measures for the purposes of calculating performance incentives in the standard component (Statewide Plan, Exh. 1, App. A at 26). The Program

Administrators claim that the exclusion of these benefits provides an incentive for them to pursue strategic electrification (Statewide Plan, Exh. 1, App. A at 26; Tr. 3, at 421-422).

The Department is not persuaded by the Program Administrators' argument that the inclusion of all benefits in the savings component may disincentivize their pursuit of strategic electrification measures. The electrification component is designed with a higher payout rate and a dedicated performance incentive pool that provides enhanced incentives to pursue strategic electrification. Further, the performance incentive mechanism must be designed to encourage the pursuit of all cost-effective energy efficiency opportunities, consistent with the Green Communities Act. G.L. c. 25, §§ 19(a), 19(b), 21(a), 21(b)(1), 21(b)(2), 21(d)(2); Guidelines § 3.6.2. Accordingly, the Department does not approve the Program Administrators' proposal to exclude marginal abatement cost benefits associated with fossil fuel measures for the purposes of calculating performance incentives in the standard component.

The Department finds that the standard component, as modified herein, is designed to avoid any perverse incentives and is as consistent as possible across all electric and gas Program Administrators. Guidelines § 3.6.2. Further, the Department recognizes that the standard component serves a similar function to the savings component included in prior three-year plans. 2019-2021 Three-Year Plans Order, at 77-78; 2016-2018 Three-Year Plans Order, at 57-58; 2013-2015 Three-Year Plans Order, at 92-93; 2010-2012 Gas Three-Year Plans Order, at 82-83; 2010-2012 Electric Three-Year Plans Order, at 95-96. The Department finds that a savings component is an essential element of a well-designed

performance incentive mechanism and historically has contributed to successfully administered energy efficiency programs. Accordingly, the Department approves the inclusion of the standard component, as modified herein, in the proposed performance incentive mechanism. The threshold for achieving a performance incentive through the standard component shall be 75 percent of planned benefits for this component or the statewide weighted portfolio threshold described above.

e. Value Component

The Program Administrators do not propose to include the value component in the performance incentive mechanism for the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 26). The Program Administrators maintain that removal of the value component is necessary because it could provide a disincentive for the Program Administrators to target the potentially more costly equity and electrification measures (Program Administrators Brief at 68-69). The Attorney General and DOER support removal of the value component from the performance incentive mechanism, arguing that it is redundant to other components of the proposed performance incentive mechanism (Attorney General Brief at 23, citing Tr. 3, at 290-291; DOER Brief at 33). DOER suggests that if the Department directs the Program Administrators to add a value component to the performance incentive mechanism, it should be comprised of distinct value components for equity, electrification, and standard energy efficiency (DOER Brief at 35).

In all previous three-year energy efficiency plans, the value component has been a central element of the performance incentive mechanism. 2019-2021 Three-Year Plans

Order, at 91-92; 2016-2018 Three-Year Plans Order, at 67-68; 2013-2015 Three-Year Plans Order, at 98; 2010-2012 Gas Three-Year Plans Order, at 101-102; 2010-2012 Electric Three-Year Plans Order, at 114. Importantly, the value component provides an incentive for the Program Administrators to pursue energy efficiency programs that maximize net benefits. 2010-2012 Gas Three-Year Plans Order, at 109-110; 2010-2012 Electric Three-Year Plans Order, at 101-102. Further, as a means to ensure that the Program Administrators continue to focus on cost efficiency as well as cost effectiveness, the Department determined that it was appropriate to tie the achievement of performance incentives to the delivery of cost-effective programs. 2019-2021 Three-Year Plans Order, at 97-98.

The Department is not persuaded by the Program Administrators' argument that a value component may disincentivize their pursuit of equity and electrification measures. Rather, the Department has found that a portion of the incentive pool must be tied to the achievement of net benefits to ensure that the Program Administrators are administering energy efficiency programs in a cost-effective manner. 2019-2021 Three-Year Energy Efficiency Plans, D.P.U. 18-110-A through D.P.U. 18-115-A and D.P.U. 18-117-A through 18-119-A, at 16-18 (2021). The Department is not persuaded that the value component is redundant in function to other elements of the proposed performance incentive mechanism, as suggested by the Attorney General and DOER. Instead, the value component ensures that the Program Administrators have an appropriate incentive to implement energy efficiency programs in a cost-effective and cost-efficient manner. D.P.U. 18-110-A through D.P.U. 18-115-A and D.P.U. 18-117-A through 18-119-A, at 16-18. Accordingly, the

Department finds that inclusion of a value component in the proposed performance incentive mechanism is necessary to encourage the Program Administrators to pursue all available cost-effective energy efficiency. Guidelines at § 3.4.7.

Further, the Department is not persuaded by DOER's argument that there should be distinct value components. In this regard, the Department finds that DOER has failed to show the benefits of its proposed structure over one that applies a value component to the net benefits of the total portfolio. In consideration of the additional costs required to achieve equity and electrification benefits, the Department finds that a value component based on portfolio-level benefits most appropriately provides an incentive for the Program Administrators to control administrative costs.

In addition, the Department cannot approve the Program Administrators' proposal to discontinue the value component because of the critical role this component plays in incentivizing the Program Administrators to minimize costs and focus efforts on core initiatives that deliver cost-effective savings. As discussed in Section V.D.1, above, the Program Administrators propose a significant increase in PP&A costs for this Three-Year Plans term. The electric Program Administrators have proposed an increase of approximately $8.4 million (or 8.6 percent) in planned PP&A costs over the Three-Year Plans term (Statewide Plan, Exh. 1, App. C.1 - Electric (Rev.), Table IV.C.2.2). The gas Program Administrators have proposed an increase of approximately $13.2 million (or 40 percent) in planned PP&A costs over the Three-Year Plans term (Statewide Plan, Exh. 1, App. C.2 - Gas (Rev.), Table IV.C.2.2). In light of these significant increases, the

Department finds it necessary to ensure that the Program Administrators possess a clear incentive to minimize administrative costs when implementing the Three-Year Plans. Accordingly, the Program Administrators shall include a value component in this and all future performance incentive mechanisms. The calculation of costs and benefits under the value component must comply with the Department's directives in the 2019-2021 Three-Year Plans Order, at 91-92.

In order to ensure that the Program Administrators have an adequate incentive to pursue net benefits, the Program Administrators shall allocate no less than 30 percent of the total incentive pool for the gas and electric Program Administrators to the value component. The threshold for achieving a performance incentive through the value component shall be 75 percent of planned portfolio net-benefits. The Department finds that this allocation is necessary to ensure that the Program Administrators have an appropriate incentive to minimize costs and focus their efforts on core initiatives that deliver cost-effective savings. Accordingly, the allocations of the total incentive pool as well as the payout rates for the electrification, equity, and standard components must be adjusted to incorporate the addition of the value component for the gas and electric Program Administrators.[128]

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128 When revising the performance incentive mechanism, consistent with the directives contained herein, the Program Administrators shall ensure that the payout rates for each component are uniform across all Program Administrators. 2016-2018 Three-Year Plans Order, at 68. Further, the Program Administrators shall recalculate the payout rates for each component consistent with the design of the components and directives contained herein, however, the payout rates for the equity and electrification components must be at least ten percent higher than the standard component payout rate.

f. Incentive Caps

The Program Administrators do not propose to cap the incentive levels for the equity and electrification components as long as the total performance incentive does not exceed 125 percent of the total portfolio design level (Statewide Plan, Exh. 1, App A at 27). Alternately, the Program Administrators propose to cap the standard component at 125 percent of the design level until the thresholds for the equity and electrification components are met (Statewide Plan, Exh. 1, App. A at 27). The Program Administrators argue that substituting a portfolio-level cap for component-level caps allows for flexibility over the Three-Year Plans term and across sectors, thereby appropriately encouraging Program Administrators to achieve savings where they exist to reach portfolio goals and avoid split incentives (Program Administrators Brief at 78).

The Department recognizes the value of allowing some flexibility in the design of the performance incentive mechanism; however, without parallel cost containment for each component, there is a risk that equity and electrification measures will not be appropriately prioritized. Accordingly, the Program Administrators shall cap performance incentives at the design level for each of the four components until all component threshold benefit levels are met. Further, if a Program Administrator meets the threshold benefit level for all components, then any additional incentives above the design level shall not be subject to the cap. This will ensure that the design of the performance incentive mechanism encourages the Program Administrators to pursue all available cost-effective energy efficiency in a way that

best achieves the Commonwealth's energy goals as well as the GHG emissions reduction goals set by the EEA Secretary.

E. Conclusion

The Department approves the proposed equity, electrification, and standard components of the proposed performance incentive mechanism, subject to the modifications and directives contained herein. The Department does not approve the Program Administrators' proposal to discontinue the value component and use a total portfolio cap. Instead, the Program Administrators shall include a value component in the performance incentive mechanism consistent with the above directives, including the directives contained in 2019-2021 Three-Year Plans Order, at 91-92. Further, the Program Administrators shall cap performance incentives at the design level for each component until all component thresholds are met, after which point further incentives will not be capped.

Consistent with Department precedent, if a program is not cost effective over the term, the Program Administrators shall remove performance incentives for the associated non-cost-effective core initiatives included in the non-cost-effective program. 2019-2021 Three-Year Plans Orders, at 98-99; D.P.U. 18-110-A through D.P.U. 18-115-A and D.P.U. 18-117-A through D.P.U. 18-119-A at 16. Finally, subject to a ten percent reduction in the statewide incentive pool for the gas and the electric Program Administrators, the Department approves the Program Administrators' proposed statewide incentive pool.

The Department finds that the revised performance incentive mechanism provides an appropriate level of incentive to encourage the Program Administrators to pursue all

cost-effective energy efficiency, while also reflecting the need for the Program Administrators to improve the quality of their filings with the Department and compliance with Department directives. Further, the modifications to the equity and electrification components, combined with the reinstatement of the value component will: (1) provide enhanced incentives for the Program Administrators to pursue strategic electrification in line with the Commonwealth's energy policies, including the goals of the Massachusetts 2050 Decarbonization Roadmap; (2) address participation barriers and improve service to environmental justice communities with historically lower participation; and (3) encourage the Program Administrators to pursue benefits in a cost-efficient manner and minimize administrative costs.

VIII. FUNDING SOURCES

A. Introduction

For electric Program Administrators, the Green Communities Act identifies four funding sources for energy efficiency programs: (1) revenues collected from ratepayers through the SBC; (2) proceeds from the Program Administrators' participation in the FCM; (3) proceeds from cap and trade pollution control programs, including but not limited to RGGI; and (4) other funding as approved by the Department, including revenues to be recovered from ratepayers through a fully reconciling funding mechanism (i.e., EES). G.L. c. 25, §§ 19(a), 21(b)(2)(vii). In approving a funding mechanism for electric Program Administrators, the Department must consider: (1) the availability of other private or public funds; (2) whether past programs have lowered the cost of electricity to consumers; and

(3) the effect of any rate increases on consumers. G.L. c. 25, § 19(a). For gas Program Administrators, the Green Communities Act requires the gas Three-Year Plans to include a fully reconciling funding mechanism (i.e., EES) to collect energy efficiency program costs from ratepayers. G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2). In approving a funding mechanism for gas Program Administrators, the Department must consider the effect of any rate increases on consumers. D.P.U. 08-50-A at 56; Guidelines § 3.2.2.2. The Department also considers the affordability of the bill impacts and the equitable distribution of costs amongst customers. G.L. c. 25, § 1A.

B. Program Administrators Proposal

1. Non-Energy Efficiency Surcharge Revenues

Each electric Program Administrator projected revenues from non-EES funding sources for each year of its Three-Year Plan in the following manner: (1) projected SBC revenues calculated as the product of the statutorily mandated SBC of $0.0025 per kWh and projected sales for the applicable year; and (2) projected FCM revenues calculated as the product of the clearing prices of the FCM in the applicable year and the energy efficiency capacity that is designated by ISO-NE as an FCM capacity resource for the year (Statewide Plan, Exh. 1, Apps. A at 38-39; C.1 – Electric (Rev.), Tables IV.B.3.1, IV.B.3.2). The electric Program Administrators propose to allocate SBC and FCM revenues to each customer sector in proportion to each class' kWh consumption (Statewide Plan, Exh. 1, App. A at 38).

In December 2019, as part of the Commonwealth's supplemental budget, the Massachusetts Legislature adjusted how DOER allocates RGGI revenues. An Act Making Appropriations for the Fiscal Year 2019 to Provide for Supplementing Certain Existing Appropriations and for Certain other Activities and Projects, St. 2019, c. 142, § 95 ("2019 Supplemental Budget"). In the 2019 Supplemental Budget, the Legislature prioritized the spending of RGGI revenues on state programs other than energy efficiency (Statewide Plan, Exh. 1, App. A at 40). As a result, the Program Administrators do not expect that any RGGI revenues will be available to offset energy efficiency program costs collected from ratepayers for the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 40).

2. Energy Efficiency Surcharge Revenues

The electric Program Administrators propose to collect the difference between (1) the proposed budget for the applicable year and (2) projected revenues from non-EES funding sources for that year through their energy efficiency reconciliation factor ("EERF") tariffs (see, e.g., Statewide Plan, Exh. 1, App. A at 40; Exh. NG-Electric-5, Table IV.B.3.6 (Rev.)). Based on current Department-approved tariffs, the electric Program Administrators calculate separate EERFs for their residential, low-income, and C&I customer classes (see, e.g., Exh. NG-Electric-5, Table IV.B.3.6 (Rev.)).

The gas Program Administrators propose to collect their proposed budgets for each year through their local distribution adjustment factor ("LDAF") as established by their local distribution adjustment clause ("LDAC") tariffs (Statewide Plan, Exh. 1, App. A at 38).

3. Other Funding Sources

The Program Administrators, citing a claimed absence of viable funding sources, do not project any revenues from other funding sources during the upcoming Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 40-41). The Program Administrators state, however, that they will continue to actively pursue other sources of funding during the Three-Year Plan term (Statewide Plan, Exh. 1, App. A at 40-41).

4. Bill Impacts

Each Program Administrator submitted bill impacts for both non-participants and participants for each year of the Three-Year Plan (see, e.g., Statewide Plan, Exh. 1, App. A at 41-43; Exh. NG-Electric-6). To calculate bill impacts for program participants, the Program Administrators developed statewide estimates to approximate savings for each customer class[129] (Statewide Plan, Exh. 1, App. A at 41-42). The participant bill impacts are based on average monthly usage levels (pre-participation) over the term of the Three-Year Plan (see, e.g., Statewide Plan, Exh. 1, App. A at 41-42; Exh. NG-Electric-6).

C. Positions of the Parties

1. Program Administrators

The Program Administrators maintain that they have complied with all statutory and Department requirements with respect to energy efficiency program funding (Program

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[129] For residential and C&I participants, the Program Administrators estimated low, medium, and high levels of savings. For residential gas non-heating, low-income, and street lighting participants, the Program Administrators identified only a single level of savings as these participants typically have all potential measures installed (Statewide Plan, Exh. 1, App. A at 42).

Administrators Brief at 63). In this regard, the Program Administrators assert that they do not expect to receive RGGI funding or other outside funding, given the current absence of material viable funding sources, to offset energy efficiency program costs during the Three-Year Plan term (Program Administrators Brief at 62-63).

The Program Administrators acknowledge that there are significant costs and bill impacts required to achieve the GHG emissions reduction goals identified in the Statewide Plan (Program Administrators Brief at 63). Accordingly, to mitigate the growing energy efficiency program cost burden on ratepayers, the Program Administrators maintain that they are: (1) actively working to identify additional outside funding opportunities; and (2) seeking assistance from government agencies with locating and allocating additional funding for energy efficiency programs (Program Administrators Brief at 63). The Program Administrators assert that both the Attorney General and DOER have committed to assisting the Program Administrators in their efforts to identify outside funding (Program Administrators Brief at 63).

The Program Administrators argue that, although the bill impacts associated with their Three-Year Plans are significant, they are necessary to meet the required GHG emissions reductions under the Climate Act (Program Administrators Brief at 60-61). The Program Administrators maintain that they have reviewed the bill impacts associated with the Three-Year Plans to ensure they are equitable and balance the expected long-term benefits from the Three-Year Plans with the short-term bill impacts (Program Administrators Brief at 60-61, citing Statewide Plan, Exh. 1, App. A at 41-43). To this end, the Program

Administrators argue that the bill impacts reflect a focus on acquiring cost-effective energy efficiency resources with the lowest reasonable customer contribution (Program Administrators Brief at 60). Accordingly, the Program Administrators assert that the Department should find the bill impacts are reasonable and consistent with Department precedent (Program Administrators Brief at 61).

2. Attorney General

The Attorney General states that she is cognizant that there are limits to the overall level of energy efficiency costs that customers can reasonably bear (Attorney General Brief at 12). She further states that these costs must be considered in the context of avoided energy supply cost savings, and the likely alternative costs to the Commonwealth required to comply with the emission reductions mandated by the Climate Act (Attorney General Brief at 12). The Attorney General asserts that the savings goals and projected budgets reflected in the Three-Year Plan filings strike an appropriate balance in accommodating cost-effective energy savings investments, achievement of GHG emissions requirements, and customer rate impacts (Attorney General Brief at 12-13).

3. Department of Energy Resources

DOER argues that the Program Administrators have taken the necessary steps to identify funding from the SBC and FCM proceeds, and other funding sources to minimize customer bill impacts (DOER Brief at 23). In addition, DOER maintains that although the energy efficiency programs in the Three-Year Plans will increase the EES, the program investments will result in significant benefits for both participants and non-participants, can

reduce customers' energy usage and bills, and are required to meet the Commonwealth's GHG emissions limits for 2030 (DOER Brief at 23).

4. Acadia Center

Acadia asserts that, given the benefits expected from the Three-Year Plans, the proposed budgets will result in minimal bill impacts (Acadia Brief at 8, 12). Acadia argues that the energy efficiency program expenditures in the Three-Year Plans will produce direct customer benefits, as well as additional macroeconomic benefits to the Commonwealth, including the creation of energy jobs (Acadia Brief at 12).

D. Analysis and Findings

1. Non-Energy Efficiency Surcharge Revenues

The electric Program Administrators anticipate that they will receive revenues through the following non-EES funding sources during the Three-Year Plans term: (1) the SBC; and (2) participation in the FCM (Statewide Plan, Exh. 1, App. A at 38). The Program Administrators will no longer have access to RGGI funding because the Legislature prioritized spending RGGI revenues on non-energy efficiency activities (Statewide Plan, Exh. 1, App. A at 40, citing St. 2019, c. 142, § 95).

The Department finds that each electric Program Administrator projected its SBC revenues over the Three-Year Plans term in a reasonable manner, using Department-approved methods for projecting sales over the term (Statewide Plan, Exh. 1, Apps. A at 38; C.1 –

Electric (Rev.), Tables IV.B.3.1).[130] The Department also finds that each electric Program Administrator projected its FCM revenues over the Three-Year Plans term in a reasonable manner (Statewide Plan, Exh. 1, Apps. A at 38; C.1 – Electric (Rev.), Tables IV.B.3.2). Finally, the Department finds that the electric Program Administrators have appropriately explained the absence of RGGI funding over the Three-Year Plans term (Statewide Plan, Exh. 1, App. A at 40).

2. Energy Efficiency Surcharge Revenues

Pursuant to the Green Communities Act, each Three-Year Plan must include a fully reconciling funding mechanism (i.e., an EES). G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2). The Guidelines specify the manner in which revenue from an EES may be collected from ratepayers. Guidelines §§ 3.2.1.4, 3.2.2.

The Department finds that the electric Program Administrators' proposal to collect their projected budgets through the EES contained in their EERF tariffs is consistent with the Guidelines.[131] Similarly, the Department finds that the gas Program Administrators' proposal

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130 NSTAR Electric incorrectly projected its SBC revenues in its initial filing; however, the company fixed the error in a revised filing (c.f., Exh. NSTAR Electric- 4, Table IV.B.3.1 and Exh. NSTAR Electric - 4 (Rev.), Table IV.B.3.1).

131 In D.P.U. 20-150, at 14, the Department directed each electric distribution company in its next rate case to submit a revised proposed EERF tariff that is designed to: (1) allocate low-income energy efficiency program costs between a single residential and low-income sector, and the C&I sector using a distribution revenue allocator; and (2) collect the resulting allocation from each rate class in the sector using a volumetric charge. Accordingly, the Department will address each electric distribution company's EERF tariff in its next rate case. See, e.g., NSTAR Electric Company, D.P.U. 22-22.

to collect their projected budgets through the EES contained in their LDAC tariffs is consistent with the Guidelines.

3. Other Funding Sources

In approving an energy efficiency funding mechanism for the electric Program Administrators, the Department must consider the availability of other private or public funds. G.L. c. 25, § 19(a)(3)(ii). Although the Green Communities Act does not contain a similar requirement for gas Program Administrators, the Guidelines require gas three-year plans to include a description of all other sources of funding that were considered to fund the energy efficiency programs. Guidelines § 3.2.2.1.

The Program Administrators maintain that, as of the filing date, other outside funding sources are scarce (Statewide Plan, Exh. 1, App. at 40-41). The Program Administrators represent, however, that the Attorney General and DOER have committed to assisting the Program Administrators in their efforts to identify outside funding sources (Program Administrators Brief at 63). The Program Administrators shall continue to work to aggressively identify and pursue all potential sources of other funding to offset the energy efficiency program costs for ratepayers (Statewide Plan, Exh. 1, App. A. at 40-41). To this end, in each EES filing, Annual Report, and Term Report during the Three-Year Plans term, the Program Administrators must include a detailed description of all efforts they have taken and will take to pursue outside funding to offset energy efficiency program costs for ratepayers, including any activities they have pursued with the assistance of the Attorney General and/or DOER. Subject to the above directive, the Department finds that the

Program Administrators have adequately considered the availability of other private or public funds. G.L. c. 25, § 19(a)(3)(ii).

4. Cost of Electricity to Consumers

In approving an energy efficiency funding mechanism for the electric Program Administrators, the Department must consider whether past programs have lowered the cost of electricity to consumers. G.L. c. 25, § 19(a)(3)(iii). The Department finds that program participants and non-participants have benefited from lower electricity costs from past programs. In particular, the Department finds that program participants have benefitted through lowered levels of usage, and participants and non-participants have benefitted though reduced wholesale electricity prices and avoided investments in transmission and distribution (see Statewide Plan, Exh. 1, App. Q, Study 1, at 23-27; see also Statewide Plan, Exh. 1, App. C.1 – Electric (Rev.), Table IV.D.3.1.i). Accordingly, the Department finds that past energy efficiency programs have lowered electricity costs to consumers, and thus also lowered participating customers' bills.

Importantly, the Department notes that this required finding references past programs only. As discussed below, given the lack of energy savings in the last year of this Three-Year Plans term for residential customers, the Department will not be able to make this finding in the future if the Program Administrators are unable to demonstrate net kWh savings or that they have lowered the cost of electricity (i.e., electric supply cost).

5. Bill Impacts

The Department must consider customer bill impacts when approving the use of ratepayer funds for energy efficiency programs. D.P.U. 08-50-A at 56-58; Guidelines §§ 3.2.1.5, 3.2.1.6, 3.2.2.2; see G.L. c. 25, § 19(a). The Department has determined that a bill impact analysis with a short-term perspective that isolates the effect of a proposed change in the EES is appropriate in this regard as it provides an accurate and understandable assessment of the change that will actually appear on customers' bills.[132] D.P.U. 08-50-D at 11-12. The Department has recognized, however, that when considering the reasonableness of a short-term bill impact, it is also important to look at the long-term benefits that energy efficiency will provide. See D.P.U. 08-50-D at 11-12. In discharging our responsibilities under G.L. c. 25, the Department must prioritize, among other things, affordability and equity. G.L. c. 25, § 1A.

These Three-Year Plans proceedings require the Department to consider for the first time the reasonableness of bill impacts to ratepayers in the context of the significantly increased budgets, driven, in part, by the Program Administrators' proposed strategic electrification programs (Statewide Plan, Exh. 1, at 8). In addition, Program Administrator budgets have increased due to new statutory requirements.[133] The Program Administrators'

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132 Going forward, in its three-year plan filing, each electric and gas Program Administrator shall provide its respective bill impact analysis in a working spreadsheet, including all formulas and linkages.

133 For example, pursuant to the Climate Act, the Program Administrators' energy efficiency budgets must include at least $36 million over the Three-Year Plan term for

total proposed 2022-2024 Three-Year Plans budget is $1.2 billion higher (29.3 percent) compared to the 2019-2021 Three-Year Plans budget. As the Program Administrators observe, the bill impacts associated with the Three-Year Plans are "significant" and "material" (Program Administrators Brief at 60-61).

Investments in traditional energy efficiency programs result in savings on a participant's bill through reduced energy usage, which will persist for the lives of the energy efficiency measures installed. D.P.U. 08-50-A at 58; 2010-2012 Electric Three-Year Plans Order, at 88; 2010-2012 Gas Three-Year Plans Order, at 74. This participant effect, however, will soon no longer be a feature of the electric Three-Year Plans. As discussed in Section IV.D.3.b, above, electricity bills for customers who electrify their heating systems and/or add air conditioning will increase. In addition, these customers may experience increased costs to heat their homes with electricity relative to a fossil fuel heat source because the cost of electricity as a heating fuel is currently higher relative to the cost of fossil fuels (Tr. 3, at 483-484; Exh. DPU-Comm 5-10). The Program Administrators estimate that some electrification projects, such as an oil heat to mini-split heat pump conversion, may increase customer lifetime operating costs by $4,000 (see, e.g., Exh. NG-Electric 2, Att. A). Further, while traditional electric energy efficiency programs are expected to deliver overall reductions in energy usage, the strategic electrification programs result in overall negative electric savings in the later years of the Three-Year Plans term. Therefore, in considering

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the clean energy workforce and market development program operated by the Massachusetts Clean Energy Center. G.L. c. 25, § 19(d).

electric bill impacts,[134] the Department can no longer rely on the fact that program participants will experience an overall reduction in energy usage (see Section IV.D.3.b., above).[135]

At the same time, in the face of significantly increased energy efficiency budgets, the Department must be cognizant of the reality of the lack of funding previously available to the Program Administrators to offset the cost of energy efficiency programs to ratepayers. As discussed in Section VIII, above, the availability of traditional and other outside funding sources to offset the costs of the energy efficiency programs to ratepayers has eroded to zero in recent years. For example, the Program Administrators historically have assumed that 80 percent of RGGI revenues would be allocated to electric energy efficiency programs. G.L. c. 25, § 19(a). However, during the 2019-2021 Three-Year Plans term, DOER projected that only 55 percent of RGGI revenues would be available to fund electric energy efficiency programs, a significant decrease from the prior three-year plan term.[136]

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134 The Department can still consider the effect of energy reduction from participants in gas energy efficiency.

135 The Department notes that in calculating participant bill impacts, the Program Administrators did not take into account the potential impact of strategic electrification on participant bills (Exh. DPU-Comm 11-6). Going forward, the Program Administrators shall develop a participant bill impact showing the range of potential electric bill impacts from strategic electrification.

136 During the 2016-2018 Three-Year Plans term, RGGI revenues offset approximately nine percent of the electric budget (i.e., $183 million of the $2.1 billion total electric budget). D.P.U. 15-160 through D.P.U. 15-169, Statewide Plan, Exh. 1, App. C – Electric (Rev.), Table IV.B.1. For the 2019-2021 Three-Year Plans term, RGGI revenues offset approximately three percent of the electric budget (i.e.,

2019-2021 Three-Year Plans Order, at 105-106. For the 2022-2024 Three-Year Plans term, the Legislature has reallocated RGGI revenues such that they are no longer available to offset the cost of energy efficiency programs to ratepayers. St. 2019, c. 142, § 95. And, as discussed above, the Program Administrators have yet to identify any other sources of private or public funding to offset costs to ratepayers in the upcoming Three-Year Plans (Statewide Plan, Exh. 1, App. A at 40-41). Unfortunately, at a time when the magnitude of the energy efficiency budgets has increased significantly to achieve the GHG emissions reduction goals set by the EEA Secretary, the availability of funds to offset these costs has all but disappeared. Between 2018 (the last program year before strategic electrification was incorporated into the three-year plans) and 2024, the residential EES for each Program Administrator is projected to increase between 16 and 82 percent[137] (see, e.g., Exh. NG-Gas-6). 2017/2018 Peak Cost of Gas Adjustment Factors and Local Distribution Adjustment Factors, D.P.U. 17-GAF-P1 through D.P.U. 17-GAF-P8 (2017). Currently, energy efficiency costs constitute approximately 20 percent of residential gas distribution rates (excluding the fixed customer charge) and 14 percent of residential electric distribution rates (excluding the fixed customer charge) (see, e.g., Exh. NG-Gas-6, at 12).

$60 million of the $2.1 billion total electric budget). D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, App. C – Electric (Rev.), Table IV.B.1 (December 20, 2018).

137 In its filing, EGMA did not provide bill impacts comparing the current EES to the proposed EES for the third year of the Three-Year Plans, as required by D.P.U. 08-50-D at 12. In addition, EGMA failed to break out the EES charge from the total LDAF charge for any of its bill impacts (Exh. EGMA-6).

Further, the Department also must acknowledge that the Program Administrators are proposing significant budget increases at a time when customers are facing unprecedented challenges due to the ongoing COVID-19 pandemic, as well as experiencing significant energy bill impacts due to rising energy supply costs. Accordingly, in the interest of equity and affordability, the Department must consider the proposed bill impacts in light of the unprecedented challenges facing customers.

When considering the reasonableness of these bill impacts, the Department will also consider the long-term benefits that programs will provide. See D.P.U. 08-50-D at 11-12. On a statewide basis, the Three-Year Plans are expected to provide total benefits of approximately $9.0 billion over the lifetime of the efficiency measures installed (Exh. DPU-Comm 8-1). Significantly, many of these benefits are derived from GHG emissions reductions. In particular, the energy efficiency programs in the Three-Year Plans are expected to reduce statewide CO_2e emissions by more than 845,000 metric tons annually by 2030 (Statewide Plan, Exh. 1, at 43).

After review, in consideration of the significant benefits provided by these Three-Year Plans, the Department's requirement to prioritize affordability and equity in discharging our responsibilities under G.L. c. 25, and mindful of the burdens associated with increased rates associated with these programs, the Department finds that the bill impacts associated with the Three-Year Plans are within the range of what is reasonable under the circumstances (see, e.g., Exh. BGC-6).

In recognition of the significant bill impacts associated with the Three-Year Plans, the Department has taken a number of steps in this Order to mitigate the effect of these bill impacts on ratepayers. The Department has reinstated the value component of the performance incentive mechanism to ensure that the Program Administrators retain an appropriate incentive to implement their programs in a cost-efficient manner. The Department has also reduced the proposed statewide performance incentive pool by ten percent. Further, the Department has directed all Program Administrators to minimize administrative costs and will not allow recovery of certain costs until the Department has reviewed and approved the adequacy of a Council data request proposal that demonstrates affirmative steps towards minimizing administrative costs. Also, to address the declining participant savings and ensure that customers benefit from strategic electrification efforts, as well as ensure safe, reliable, equitable, and affordable service, the Department has directed the Program Administrators to provide all low-income customers with weatherization prior to electrification measures in order to mitigate increases in electric bills.

Further, while the Department determined that the proposed bill impacts of the planned budgets are within the range of what is reasonable under the circumstances we are presented with here, the Department finds that given the scale of the budget increase compared to planned energy savings and the challenges currently experienced by customers, bill impacts under the current threshold for increasing budgets through midterm modifications

are not reasonable.[138] Accordingly, for the 2022-2024 Three-Year Plans term, a Program Administrator may not exceed its planned program budget without approval by the Department. In addition, to qualify for a program budget modification, the Program Administrator must demonstrate that an increase in budget results in an increase in kWh or therm savings.[139] Together, the Department finds that these steps are an important means to ensure that the Program Administrators deliver the full benefits of the Three-Year Plans in a cost-efficient manner at the lowest possible cost to ratepayers.

Finally, as the Department has noted above, the bill impacts associated with these Three-Year Plans are significant and material. Notably, these Three-Year Plans are one of several statutory policy initiatives that the Department has overseen in recent years to further

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138 Pursuant to Guidelines § 3.8.2(c), a Program Administrator may overspend a sector level budget by ten percent without the need for prior Department approval. If a Program Administrator projects to exceed a sector level budget by more than ten percent, the Program Administrator must submit its proposed budget change at the same time for (1) review by the Council, and (2) review and approval by the Department. Guidelines § 3.8.2(c). For the 2022-2024 Three-Year Plans term, Guidelines § 3.8.2(c) is supplanted by the midterm modification directives contained in this section.

139 If a Program Administrator projects it will exceed a program-level budget, the Program Administrator shall simultaneously submit any proposed budget change (1) for review by the Council and (2) for review and approval by the Department. Such proposal must clearly demonstrate that the proposed budget change will result in an increase in kWh or therm savings. If the Council opposes the proposed program budget midterm modification, it must submit a resolution to the Department addressing its opposition within 60 days of the filing date. The Program Administrator will then have 30 days to submit further justification to the Department, including supporting testimony and documentation, showing why the proposed program budget modification should be approved.

the Commonwealth's critical energy policy goals. Initiatives such as net metering, the SMART Program, off-shore wind and hydroelectric procurements, and EV initiatives, as well as the Department-initiated grid modernization initiatives, each deliver essential benefits to the citizens of the Commonwealth.[140] And like the Three-Year Plans, these initiatives are also funded through reconciling mechanisms that allow the electric distribution companies to recover the cost of these programs directly from ratepayers. Currently, when combined with energy efficiency, these programs constitute approximately 25 percent of residential electric distribution rates (excluding the fixed customer charge) (see, e.g., Exh. NG-Electric-6, at 7). Accordingly, although the Department recognizes that substantial benefits flow to the citizens of the Commonwealth from these policy initiatives, the Department and policy makers must remain cognizant of the cumulative effect that these programs will have on customer bills now and in the future.

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140 See, e.g., 220 CMR 18.00; Model SMART Provision, D.P.U. 20-145-B (2021); Long-Term Offshore Wind Contracts, D.P.U. 21-40 (2021); Long-Term Hydroelectric Contracts, D.P.U. 18-64/D.P.U. 18-65/D.P.U. 18-66 (2019); Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 21-146 (electric vehicle supplemental budget); NSTAR Electric Company, D.P.U. 21-90 (electric vehicle infrastructure program); Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 21-91 (electric vehicle infrastructure program); Fitchburg Gas and Electric Light Company, D.P.U. 21-92 (electric vehicle infrastructure program); 2022-2025 Grid Modernization Plans, D.P.U. 21-80/D.P.U. 21-81/D.P.U. 21-82.

6. Conclusion

After the consideration of (1) the availability of other private or public funds; (2) the legislative reallocation of RGGI revenues from energy efficiency programs; (3) whether past programs have lowered the cost of electricity to consumers; and (4) the effect of rate increases on consumers, the Department finds that, subject to the conditions above, each Program Administrator may recover the funds to implement its energy efficiency plan through its EES.

IX. FUTURE OF REVENUE DECOUPLING

A. Introduction

In Section IV.D.3.b., above, the Department approved the Program Administrators' expansion of strategic electrification to drive energy and GHG emissions reductions. For the reasons discussed below, the Department finds that the Program Administrators' adopted strategy of strategic electrification in these Three-Year Plans obviates the need for the continued use of revenue decoupling by the electric distribution companies.

B. Revenue Decoupling

The Department has allowed revenue decoupling for each electric and gas distribution company since the passage of the Green Communities Act in 2008.[141] Investigation into Rate

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[141] The Department implemented decoupling in base rate proceedings. Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 09-39, at 61-92 (2009); Fitchburg Gas and Electric Light Company, D.P.U. 11-01/11-02, at 113 (2011); NSTAR Electric Company/Western Massachusetts Electric Company, D.P.U. 17-05-B at 219 (2018).

Structures that will Promote the Efficient Deployment of Demand Resources, D.P.U. 07-50-A at 31-32 (2008). Prior to revenue decoupling, the electric distribution companies were able to retain increased revenue collection from the sale of electricity that could be reinvested into their systems between rate cases. Revenue decoupling removed the disincentive to reduce load. D.P.U. 07-50-A at 27-28, 32-33, 87. Full revenue decoupling separates a distribution company's revenues from all changes in consumption, regardless of the underlying cause of the changes, in order to remove the disincentives distribution companies historically faced regarding deployment of demand reducing resources. D.P.U. 07-50-A at 31. The Department correctly anticipated that, with the passage of the Green Communities Act in 2008, aggressive deployment of demand resources would be an essential component of the Commonwealth's strategy to mitigate the impact of increasing energy costs, through direct benefits to program participants as well as benefits to all customers through a dampening of natural gas and electricity commodity prices. D.P.U. 07-50-A at 33. The Department was concerned that, without full revenue decoupling, distribution companies would not be able to fully embrace the successful implementation of demand-reducing measures and actions. D.P.U. 07-50-A at 33. Since the Department's decision to institute revenue decoupling in 2008, the Green Communities Act was enacted and the Program Administrators have achieved significant levels of electric and gas savings.

C. Impact of Changing Energy Policies

Recent changes in the Commonwealth's energy policies fundamentally obviate the underlying premise supporting the Department's earlier adoption of revenue decoupling for electric distribution companies. The Energy Act of 2018 allows Program Administrators to include strategic electrification measures that reduce energy consumption and cost-effectively reduce GHG emissions, while minimizing costs to ratepayers. St. 2018, c. 227, § 2. This policy shift allows the Program Administrators to increase electricity consumption through the energy efficiency programs. The Climate Act then expanded on the energy policies set forth in the Energy Act of 2018 by requiring the Program Administrators implement their energy efficiency programs in a manner that reduces customer energy usage but also contributes to specific GHG emissions reduction goals. St. 2021, c. 8, §§ 9, 28; G.L. c. 21N, § 3B; G.L. c. 25, § 21(d)(4). Accordingly, the Climate Act now requires the Program Administrators to drive adoption of energy efficiency measures to achieve a minimum level of sustained GHG emissions reductions. Energy efficiency remains the most cost-effective way to reduce energy usage, and the Program Administrators have had years of nation-leading success of lowering consumer and system costs through their implementation of the Mass Save program. However, the evolving strategic electrification of the building sector is one of the primary strategies to achieve the GHG emissions reduction goals set by the EEA Secretary pursuant to the Climate Act (Statewide Plan, Exh. 1, at 11-12). See Massachusetts 2050 Decarbonization Roadmap at 45-46.

During this upcoming Three-Year Plans term, the electric and gas Program Administrators have committed to making a concerted effort to promote electrification, particularly in instances in which customer economics and building characteristics (e.g., the displacement of delivered fuels, building new construction, etc.) favor the use of high-efficiency heat pump technologies, including air source, water source, ground source (geothermal), and variable refrigerant flow heat pumps, which will increase use on the electric distribution system (Statewide Plan, Exh. 1, at 12). In addition, the electric Program Administrators intend to pursue additional opportunities to bolster electrification in other areas, which may include electrifying end uses such as residential and C&I lawn and garden equipment, forklifts, and other small engine-driven equipment, where cost effective (Statewide Plan, Exh. 1, at 15). The Department's approval of the Program Administrators' strategic electrification proposals, including the goals to meet GHG emissions reductions pursuant to G.L. c. 21N, § 3B, marks a fundamental shift in the delivery of energy efficiency in the Commonwealth. The Three-Year Plans are now effectively required by the Climate Act to be designed to net increase kWh consumption; and the Program Administrators currently plan to engage in a level of strategic electrification by 2024 that, despite the energy efficiency measures designed to lower electric use, will result in a net lifetime increase in kWh consumption in the residential sector (Statewide Plan, Exh. 1, App. C.1 - Electric (Rev.), Table IV.D). As discussed above in Section IV.D.3.b., this increased electrification enabled through these Three-Year Plans will help the Commonwealth achieve its net-zero GHG emissions goals (Statewide Plan, Exh. 1, at 12).

The Department notes that the impact of the Climate Act and the Commonwealth's net-zero emission goal is not limited to strategic electrification through energy efficiency. Transportation is the largest source of carbon emissions and, therefore, there also are electrification efforts outside of space heating and water heating (Statewide Plan, Exh. 1, at 15).[142] See Massachusetts 2050 Decarbonization Roadmap at 34-43 (December 2020).

D. Decoupling for Electric Distribution Companies

The Statewide Plan presents a hybrid approach mixing traditional energy efficiency measures and strategic electrification proposals to reduce energy consumption and GHG emissions. However, as discussed above, even with the core energy efficiency and demand response measures contained in this Statewide Plan, the expansion of the Program Administrators' strategic electrification offerings will increase the use of electricity on the regional power grid (Statewide Plan, Exh. 1, App. C.1 - Electric (Rev.), Table IV.D). In order to pursue a clean energy future consistent with the Massachusetts 2050 Decarbonization Roadmap, broad electrification achieved through the Program Administrator's strategic electrification efforts combined with even more significant electrification efforts outside the Three-Year Plans is necessary. However, these efforts will require expanding the use of electric generation and will place more stress on the electric distribution system. These factors lead the Department to conclude that we must discontinue full revenue decoupling for

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142 The Department notes that the electric distribution companies are pursuing direct transportation interventions in other proceedings. See, e.g., NSTAR Electric Company, D.P.U. 21-90; Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 21-91; Fitchburg Gas and Electric Light Company, D.P.U. 21-92.

electric distribution companies. By discontinuing full revenue decoupling, the Department will ensure that electric distribution companies' business models continue to align with the Commonwealth's policy goals, and thus, the Department seeks to reorient the electric distribution companies to no longer be neutral but, rather, to embrace increasing clean electric load.[143]

The Department does not come to this decision lightly, but there are many reasons that it is appropriate to make this policy change immediately. First, the Department finds that it is in ratepayers' best interests to no longer make the electric distribution companies whole for lost sales if that is no longer in line with the Commonwealth's energy policy. Second, timely implementation of a transition away from revenue decoupling is necessary to align the business interests of the electric distribution companies to embrace strategic electric load growth in a safe, reliable, affordable, and equitable manner, as the Department is considering several policies to advance the clean energy future.[144] Last, implementing this

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143 The discontinuance of revenue decoupling, alone, will not grow clean electric load. It will require many other policies and customer decisions outside the scope of this Order to ensure that load growth from electrification will, in fact, reduce GHG emissions.

144 In addition to strategic electrification within the context of energy efficiency, the Department is assessing long-term system planning to enable the strategic development of renewable energy assets in Distributed Energy Resource Planning and Cost Assignment, D.P.U. 20-75; proposals to advance grid modernization and deploy advanced metering infrastructure in NSTAR Electric Company, D.P.U. 21-80; Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 21-81; Fitchburg Gas and Electric Light Company, D.P.U. 21-82; and proposals to institute electric vehicle charger tariffs and investments in grid infrastructure to enable

policy change now will shift the risk associated with changes in lost revenues from customers to electric distribution company shareholders, while simultaneously increasing the incentive for the electric distribution companies to pursue and enable electrification.

The Department has broad ratemaking authority over gas and electric companies pursuant to G.L. c. 164, § 94, which establishes the Department's statutory obligations to set the rates of gas and electric companies. The courts have consistently stated that the Department's authority to design and set rates pursuant to G.L. c. 164 is broad and substantial. Boston Real Estate Board v. Department of Public Utilities, 334 Mass. 477, 485 (1956). Determining the appropriateness of a base rate revenue adjustment mechanism is within the Department's broad ratemaking authority. See D.P.U. 07-50-A at 81; D.P.U. 07-50-B at 27. The Department must balance this policy change with existing rate structures in place, such as performance-based ratemaking, which involve multi-year stay-outs for distribution companies, as well as approved settlement agreements. The Department acknowledges that changes or adjustments to any ratemaking structure can lead to a significantly different distribution of equity and risks between the company and its customers, between classes of customers, among customers within a given rate class, and across time. Investigation into Rate Structures that will Promote Efficient Deployment of Demand Resources, D.P.U. 07-50 at 10 (2007). Further the Department also recognizes that the removal of the revenue decoupling mechanism comes before any increase in distribution sales

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installation of electric vehicle chargers in D.P.U. 21-90; D.P.U. 21-91; D.P.U. 21-92.

from the strategic electrification efforts under these Three-Year Plans, and the Department will need to take economic forecasts into account while also looking at planned strategic electrification activities (Statewide Plan, Exh. 1, App. C.1 - Electric (Rev.), Table IV.B.3.1). Accordingly, the Department directs each electric distribution company, in its next base rate proceeding, to include a rate proposal that provides for the discontinuance of full revenue decoupling.[145,146] Any electric distribution company with an approved rate plan with a stay-out provision that is the result of a settlement or a performance-based ratemaking term may not seek to terminate its effective rate plan in order to discontinue revenue decoupling.

With the discontinuance of full revenue decoupling, the electric distribution companies will no longer have a disincentive to pursue strategic electrification because they now will be able to retain the sales from increased load. For these Three-Year Plans, performance incentives will continue to play an important role in encouraging distribution companies to pursue all cost-effective energy efficiency, including strategic electrification. Because the

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145 The Department may also consider implementing a targeted decoupling mechanism that achieves the Commonwealth's electrification goals and GHG emissions reduction goals as part of each company's next base rate proceeding. D.P.U. 07-50-A at 29-30.

146 The Department notes that Eversource (electric) filed a distribution rate case on January 14, 2022, in NSTAR Electric Company, D.P.U. 22-22. The Department will address the discontinuance of full revenue decoupling for Eversource (electric) in that proceeding. National Grid (electric)'s performance-based ratemaking plan expires on September 30, 2024. Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 18-150, at 54-56 (2019). Finally, Unitil (electric)'s settlement expires on November 1, 2023. Fitchburg Gas and Electric Light Company (Electric Division), D.P.U 19-130, at 8 (2020).

discontinuance of full revenue decoupling will not be immediate, nor are sales expected to immediately increase as a result of the Three-Year Plans, the Department finds that it is appropriate to retain an electrification metric, as modified, for this Three-Year Plans term.[147] See Section VII.D.2.c, above. Once full revenue decoupling is discontinued, an electrification metric will no longer be necessary in future three-year plans.

E. Decoupling for Gas Program Administrators

Unlike the electric Program Administrators, the proposals contained in the Three-Year Plans do not fundamentally change the premise supporting the application of revenue decoupling for the gas distribution companies. The gas Program Administrators' energy efficiency programs, including strategic electrification, are designed to reduce overall customer gas usage and demand (see Statewide Plan, Exh. 1, passim). Unlike electric Program Administrators, the net impact of the gas Program Administrators' Three-Year Plans is a reduction in annual and lifetime therms (Statewide Plan, Exh. 1, App. C.2 - Gas (Rev.), Table IV.D.3.2.i). Therefore, the Department will not mandate the discontinuance of revenue decoupling for gas distribution companies.[148]

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147 In order to achieve the goal of cost-effective decarbonization, strategic electrification must include weatherization and traditional energy efficiency delivered in conjunction with electrification measures.

148 The Department has opened an investigation to consider the appropriate role of local gas distribution companies in achieving decarbonization. Investigation into the Role of Gas Local Distribution Companies as the Commonwealth Achieves its Target 2050 Climate Goals, D.P.U. 20-80. The Department may evaluate appropriate rate adjustment mechanisms, such as revenue decoupling, as part of that proceeding.

X. RESIDENTIAL CONSERVATION SERVICES

A. Introduction

The RCS statute, G.L. c. 164 App., §§ 2-1 to 2-10, was promulgated in 1980 and provides a framework for in-home energy conservation services for residential customers. Pursuant to the Energy Act of 2012, the Program Administrators have elected to incorporate the RCS filings for 2022-2024 in their respective Three-Year Plans. St. 2012, c. 209, §§ 32(h), (i). Therefore, the Department is required to review the reasonableness of the proposed RCS budgets in the instant proceedings. G.L. c. 164 App., § 2-7(b); St. 2012, c. 209, § 32(i).[149]

An energy scorecard is a tool used to understand how a home or building's energy consumption compares to similar homes or buildings. The Program Administrators first indicated that they intended to implement home energy scorecards as part of residential in-home energy assessments beginning in 2019.[150] 2019-2021 Three-Year Plans Order, at 169-170. The Program Administrators did not, however, include an energy scorecard proposal or associated budget as part of their RCS filings in the 2019-2021 Three-Year Plans.

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149 On April 17, 2017, DOER promulgated revised RCS regulations, 225 CMR 4.00. On February 20, 2020, DOER released revised final guidelines ("RCS Guidelines") interpreting 225 CMR 4.00. DOER, Guideline Interpreting 225 CMR 4.00 (February 20, 2020), available at https://www.mass.gov/doc/rcs-guideline-revised-2202020/download.

150 DOER's RCS Guidelines require the Program Administrators to offer DOER-approved energy scorecards in conjunction with in-home energy audits. RCS Guidelines § 2.B.1.

2019-2021 Three-Year Plans Order, at 169, 174. Accordingly, the Department did not make any substantive findings regarding energy scorecards or associated RCS budgets. 2019-2021 Three-Year Plans Order, at 174. The Department found, to the extent the Program Administrators could implement energy scorecards within the scope of their approved RCS budgets, they would not be required to obtain further Department approval. 2019-2021 Three-Year Plans Order, at 174. Alternately, the Department directed the Program Administrators to file an amended RCS budget for Department review if implementation of energy scorecards required an increase to an approved RCS budget of greater than 20 percent. 2019-2021 Three-Year Plans Order, at 174-175. No amended RCS budget proposals were filed with the Department.

B. Program Administrators Proposal

Each Program Administrator proposes to include its RCS budget as part of the Residential Existing Buildings program for each year of the Three-Year Plan term (Statewide Plan, Exh. 1, App C.1, at 12). In response to discovery, the Program Administrators provided a breakdown of the proposed RCS budget by: (1) home energy assessment costs for market rate single family and low-rise units; (2) the RCS assessment fee paid to DOER; and (3) home energy scorecard costs (Exh. DPU-Comm 7-5; see, e.g., Exh. NSTAR-Gas-2, at 107). The Program Administrators propose to continue to recover RCS costs through the EES (Statewide Plan, Exh. 1, App A at 40 n.112).

Although they have allocated a portion of the RCS budget to home energy scorecards, the Program Administrators again did not include a home energy scorecard proposal in their

Three-Year Plan (Statewide Plan, Exh. 1, at 91-98). Instead, in response to discovery issued by DOER, the Program Administrators described the work they accomplished during the 2019-2021 Three-Year Plan term on home energy scorecards, as well as a timeline for their plans to deliver home energy scorecards in conjunction with in-home audits in the Three-Year Plan term (Exh. DOER-Comm 1-4). The Program Administrators expect to start using home energy scorecards in the first quarter of 2022 (Exh. DOER-Comm 1-4, at 3).

C. Positions of the Parties

1. Program Administrators

The Program Administrators argue that their proposed RCS program budgets are fully consistent with the Green Communities Act, 220 CMR 7.02, and applicable Department directives (Program Administrators Brief at 59, citing 2013-2015 Three-Year Plans Order, at 128). The Program Administrators further argue that contrary to DOER's assertions, they are fully compliant with DOER's RCS Guidelines (Program Administrators Reply Brief at 4-5, citing DOER Brief at 41). The Program Administrators maintain that these issues, by DOER's own admission, involve implementation of the Three-Year Plans and are of no consequence to the Department's approval of the proposed RCS budgets (Program Administrators Reply Brief at 5, citing DOER Brief at 41).[151] The Program Administrators

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[151] The Program Administrators assert that certain of DOER's arguments regarding RCS compliance relies on extra record evidence or are otherwise without evidentiary support (Program Administrators Reply Brief at 5-6, citing DOER Brief at 40-41 & n.119). The Program Administrators did not, however, move to strike any portion of DOER's Reply Brief.

maintain that, regardless of any disagreements they have with DOER, the proposed RCS budgets should be approved (Program Administrators Reply Brief at 7).

The Program Administrators acknowledge that they missed the original target launch date for home energy scorecards but maintain that the delay was with good reason (Program Administrators Reply Brief at 6-7). The Program Administrators maintain they are ready to launch the home energy scorecard campaign (Program Administrators Reply Brief at 6-7).

Lastly, the Program Administrators argue, contrary to DOER's assertions, G.L. c. 164, App. § 2-3(c) explicitly requires customer consent to disclose the contents of a home energy assessment audit report to parties other than those specified by the statute (Program Administrators Reply Brief at 7, citing DOER Brief at 40-41). In particular, the Program Administrators assert that data from the home energy assessments will be shared with the United States Department of Energy ("DOE") for the development of the energy scorecards, thus invoking the confidentiality provisions in G.L. c. 164, App. § 2-3(c) (Program Administrators Reply Brief at 7).

2. Attorney General

The Attorney General acknowledges that the Program Administrators have not yet implemented energy scorecards (Attorney General Reply Brief at 3). Nonetheless, the Attorney General maintains that the Department should approve the Program Administrators' proposed RCS budgets, including funding for home energy scorecards (Attorney General Reply Brief at 3).

3. Department of Energy Resources

DOER argues that the Department should approve the Program Administrators' RCS budgets, which include the cost of implementing home energy scorecards (DOER Brief at 41). DOER argues that the proposed RCS budget are reasonable, but the Program Administrators are not in full compliance with the RCS statute and its RCS Guidelines as they relate to home energy scorecards (DOER Brief at 39).

According to DOER, in order to comply with the RCS regulations and its RCS Guidelines, the Program Administrators agreed to implement residential home energy scorecards as part of in-home assessments by July 2019 (DOER Brief at 40). DOER asserts that the Program Administrators' roll out of home energy scorecards is over two years behind schedule (DOER Brief at 40-41).

In addition, DOER argues that the benefits of home energy scorecards will be limited by the Program Administrators' proposal to require affirmative customer consent to disclose the contents of an audit report to outside parties (DOER Brief at 40-41). DOER maintains that it intends to address the issue of home energy scorecards, including customer consent, with the Program Administrators (DOER Brief at 40-41).

D. Analysis and Findings

While DOER develops the state plan for RCS programs, the Department is expressly charged with reviewing the reasonableness of the budget and expenditures, and may modify the budget. St. 1980, c. 465 § 7(b). The Program Administrators must include a description of the activities that support the requested budget. See 2019-2021 Three-Year Plans Order,

at 174. The Department has reviewed the Program Administrators' proposed RCS budgets and, with the exception of the portion of the budgets allocated to home energy scorecards, the Department finds that the budgets are reasonable (see, e.g., Exh. FGE (gas)-4 (Rev.), Table IV.C). Accordingly, with the exception of the portion of the budget allocated to home energy scorecards discussed below, the Department approves the Program Administrators' proposed RCS budgets.

While the Program Administrators have allocated a portion of their RCS budgets to home energy scorecards, the Program Administrators did not file an energy scorecard proposal as part of their RCS filings in the instant proceedings (Exhs. NG-Gas-2, at 111-112; BGC-2, at 106-107; EGMA-2, at 107-108; NSTAR-Electric-2, at 102-103; FGE-Gas-2, at 107; LU-2, at 105-106; NSTAR-Gas-2, at 107-108; Compact-2, at 104; FGE-Electric-2, at 102; NG-Electric-2, at 110; DPU-Comm 7-5). In fact, the phrase "home energy scorecard" or the like does not appear anywhere in the text of the Three-Year Plans. During discovery and in response to a record request, the Program Administrators provided some information regarding activities they had taken during the 2019-2021 Three-Year Plans term regarding home energy scorecards, including a contractual agreement with DOE to produce a home energy score (RR-DOER-1; Exh. DOER-Comm 1-4).

In order for the Department to conduct a timely and complete investigation and ensure that stakeholders have the requisite information to understand and evaluate a proposal, the Program Administrators must make a full and complete filing where all relevant and material facts and issues are properly included. Revised Model SMART Provision, D.P.U. 20-145-B

at 31 (2021). Despite the additional information solicited by DOER through discovery, the Department is not in receipt of a comprehensive proposal or itemized budget from the Program Administrators for home energy scorecards. Accordingly, the Department is unable to make any findings regarding the reasonableness of the proposed energy scorecard budgets in the instant proceeding.[152]

To receive authorization to use ratepayer-provided funds to implement home energy scorecards, the Program Administrators must file a formal energy scorecard proposal with the Department.[153] The proposal should take the form of an amendment to their RCS operating budgets pursuant to G.L. c. 164 App., § 2-7(b). Each filing shall include prefiled testimony and exhibits addressing: (1) a detailed home energy scorecard proposal;[154] and

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152 The Department will address the prudence of any home energy scorecards expenditures during the 2019-2021 Three-Year Plans term as part of our investigation of the Program Administrators' forthcoming 2019-2021 Term Report filings.

153 The Department distinguishes our treatment of the home energy scorecard issue here from our treatment of the issue in the 2019-2021 Three-Year Plans. In the earlier case, the Program Administrators did not include an energy scorecard proposal, but the Department found, if the Program Administrators could implement scorecards within their approved RCS budgets, they would not be required to obtain further Department approval. 2019-2021 Three-Year Plans Order, at 174. When we made this finding, home energy scorecards were novel, and the Department fully expected the Program Administrators would implement scorecards during the 2019-2021 Three-Year Plans term. Three years have passed, and the Program Administrators have yet to finalize the elements of a plan for home energy scorecards. Here, in the continued absence of an appropriate home energy scorecard proposal, the Department cannot authorize an RCS budget as reasonable for this purpose.

154 The Program Administrators shall address how they intend to incorporate the impact of electrification measures in any home energy scorecard proposal.

(2) an itemized RCS budget with information specific to home energy scorecards necessary to carry out the proposal. See, e.g., NSTAR Gas Company. D.P.U. 11-RCS-11, Petition (2011). As part of the required compliance filings in the instant proceedings, the Program Administrators shall remove all costs associated with energy scorecards from the RCS budgets.

As a final matter, the Department addresses whether the Program Administrators must obtain customer consent to disclose the contents of an energy audit report to a third party in connection with the development of energy scorecards. The Program Administrators maintain that data collected during a home energy assessment will be used by DOE to develop a customer's energy scorecard and, therefore, pursuant to G.L. c. 164, App. § 2-3(c),[155] the Program Administrators must obtain affirmative consent to disclose the name of a customer or contents of an energy audit report to DOE (Program Administrators Reply Brief at 7). We agree.

The Department treats certain customer-specific information as confidential and the Program Administrators are not permitted to disclose personal information about customers including name, address, and usage data, without the customers' permission. See New

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155 General Laws c. 164, App. § 2-3(c) provides:

> No person shall disclose the name of a customer or the contents of an energy audit report prepared for such customer to any person other than the customer, a subsequent purchaser of the audited building, the utility serving such customer, the commissioner of energy resources, or their designees, unless the customer or subsequent purchaser waives his right to confidentiality with respect to such information provided[.]

England Gas Company, D.P.U. 10-114, Hearing Officer Ruling at 6-7 (June 6, 2011); Fitchburg Gas and Electric Light Company, D.P.U. 08-ARR-4, Hearing Officer Ruling at 4 (April 7, 2008). Although DOER maintains that a requirement to obtain affirmative consent "significantly limits" the benefits of scorecards, DOE is not specifically exempted by G.L. c. 164, App. § 2-3(c), which requires customers to waive their right to confidentiality of the data contained in an energy audit report before it can be shared with a third party such as DOE. Accordingly, the Department finds that the Program Administrators must obtain affirmative customer consent before sharing any confidential information (e.g., customer name, address, and usage data) contained in an energy audit report with third parties. The Department trusts that the Program Administrators will work collaboratively with DOER to develop an appropriate process to obtain customer consent to disclose such information for the purposes of developing an energy scorecard.

XI. CAPE LIGHT COMPACT

A. Introduction

The Compact is a municipal aggregator that has received Department approval to administer electric energy efficiency to member municipalities. See, e.g., Cape Light Compact, D.P.U. 15-166 (2016). It is the only energy efficiency Program Administrator that is not an investor-owned utility. NSTAR Electric is the electric distribution company and National Grid (gas) is the local gas distribution company serving electric and gas customers, respectively, in the Compact's member municipalities.

Based on our review of the Compact's proposed Three-Year Plan, several issues warrant discussion in the sections below: (1) the Compact's proposed Statewide Plan enhancements; (2) the administration of energy efficiency services to gas customers in the National Grid (gas) service territory; (3) the allocation of costs between the Compact's municipal aggregation plan and its energy efficiency plan; and (4) equity and historical participation rates.

B. Statewide Plan Enhancements

1. Introduction

In its 2022-2024 Three-Year Plan, the Compact proposes to offer the following enhancements: (1) incentives up to 100 percent for low-and moderate-income residential multifamily new construction projects; (2) a strategic electrification offering called the "Cape and Vineyard Electrification Offering ("CVEO")"; and (3) incentives up to 100 percent for municipal customers, small non-profits, small businesses, and micro businesses (Statewide Plan, Exh. 1, App. G.1, at 3).

2. Cape Light Compact Proposal

a. Residential New Buildings and Residential New Homes and Renovations

The Compact proposes to offer enhanced incentives for income-eligible and moderate-income residential multi-family new construction projects (Exh. Compact-2, at 139). Specifically, the Compact proposes to offer: (1) a 100 percent incentive for weatherization measures above code for income-eligible and moderate-income buildings; (2) a 100 percent incentive for heat pumps for projects where 51 percent of the building is

occupied by income-eligible customers; (3) an 80 percent incentive for heat pumps for projects where 51 percent of the building is occupied by moderate-income customers; and (4) a $2,000 per unit incentive, capped at $60,000, for a project engineering study and to fund an operating and maintenance contract for up to three years (Exh. Compact-2, at 139-140).

b. Cape and Vineyard Electrification Offering

The Compact proposes to offer a strategic electrification offering (i.e., the CVEO), which will provide enhanced incentives for the combined installation of: (1) cold-climate air-source heat pumps, (2) solar PV, and (3) behind-the-meter battery energy storage, limited to 250 customers in non-gas heated homes (Statewide Plan, Exh. 1, App. G.1, at 2; Exhs. Compact-2, at 133; Compact-9, at 1-2). The Compact states that CVEO is limited to low-income (i.e., less than or equal to 60 percent of state median income) and moderate-income (i.e., 61-80 percent of the state median income) customers (Statewide Plan, Exh. 1, App. G.1, at 2; Exhs. Compact-2, at 133; Compact-9, at 1-2).

Through the proposed CVEO, customers will: (1) convert oil, propane, or electric resistance heat systems to heat pumps; (2) install solar PV systems to support electrification of their heating systems; and (3) install battery energy storage for demand response and resiliency (Statewide Plan, Exh. 1, App. G.1, at 2; Exh. Compact-2, at 133). The Compact proposes that low-income customers will receive all three technologies at no cost, while moderate-income customers will receive all three technologies at a maximum cost of $5,000 per participant (Exh. Compact-9, at 9). The Compact states that all CVEO participants will

be required to implement recommendations from a recent home energy assessment, including any weatherization recommendations (Exh. Compact-9, at 4).

The Compact proposes to use a third-party ownership model for the solar PV plus battery energy storage systems, which allows the third-party to own the assets and monetize tax credits/depreciation and other incentive programs over a ten-year period (Statewide Plan, Exh. 1, App. G.1, at 2).[156] The Compact proposes that the third-party owner would install the solar PV and battery energy storage systems in a CVEO participant's home (Exh. Compact-9, at 6). The Compact further proposes that the third-party owner would use the existing incentive programs to offset its initial costs and the Compact would use ratepayer-provided energy efficiency program funding to cover the third-party owner's remaining cost (Exh. Compact-9, at 9). Without outside incentives or financing, the Compact estimates that the solar PV and battery system would cost a customer about $52,000 (Exh. Compact-9, at 6).

The Compact proposes to offer both low- and moderate-income customers a 100 percent incentive for the cost of switching from heating with oil, propane, or electric baseboards to heating with heat pumps (Exh. Compact-9, at 4). The proposed CVEO heat

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156 The tax credits/depreciation and incentives include: (1) funding from the federal Investment Tax Credit ("ITC"); (2) tax depreciation; (3) SMART Program; (4) ConnectedSolutions; (5) Clean Peak Energy Standard incentives; and (6) Alternative Portfolio Standard incentives (Statewide Plan, Exh. 1, App. G.1, at 2). The Compact estimates the cost of CVEO batteries participating in ConnectedSolutions will be about $982,000 in incentives and about $20,000 in sales, technical assistance, and training (Exh. Compact-9, at 13).

pump measure mix assumes heat pump costs range from $13,000 to $25,000 per system (Exh. Compact-9, at 4). The estimated cost of Compact's proposal to offer heat pumps at 100 percent incentive for low-income customers over two years is approximately $2.8 million and the CVEO heat pump incentive cost for moderate-income customers over two years is approximately $2.0 million (Exh. Compact-9, at 4-5). The Compact proposes to fund all heat pump costs using ratepayer-provided energy efficiency program funding (Exh. Compact-9, at 5).

The Compact also filed a CVEO proposal in Cape Light Compact, JPE, D.P.U. 20-40.[157] The Compact has identified the following differences between its CVEO proposal in D.P.U. 20-40 and its CVEO proposal in the instant proceeding:[158] (1) an increase in assumed battery costs from $10,000 per battery to $12,000 per battery, based on more recent experience; (2) a reduction in battery output estimates based on updated data; (3) reductions in projected SMART revenues due to a later expected implementation date;

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157 As discussed further below, the Department declined to approve the Compact's proposed CVEO proposal finding that, in addition to other deficiencies, the manner of funding for the proposed CVEO was contrary to the laws of the Commonwealth and, therefore, could not be approved as an enhancement to the Statewide Plan under G.L. c. 164, § 134. Cape Light Compact, JPE, D.P.U. 20-40-A at 20-32 (2021). On November 24, 2021, the Compact appealed the Department's Order in D.P.U. 20-40 to the Supreme Judicial Court.

158 The Compact's cost estimates in its earlier CVEO proposal in D.P.U. 20-40 were based on its proposal to operate the program over two years (i.e., 2020 and 2021). D.P.U. 20-40, Petition, Exh. ATB at 7 (May 15, 2020). Here, the Compact proposes to operate the proposed CVEO over the entire Three-Year Plan term (see, generally, Exh. Compact-9).

(4) an increase in the projected ConnectedSolutions incentives consistent with Program Administrators' planning assumptions; and (5) a shift of participant enrollments from the end of the 2019-2021 Three-Year Plan term (i.e., "backloaded") to the beginning of the 2022-2024 Three-Year Plan term (i.e., "front-loaded") in order to maximize the availability of a higher solar federal tax credit (Exh. Compact-2, at 135).

c. Commercial and Industrial Program Enhancements

The Compact proposes to offer up to 100 percent incentives for municipal customers, small non-profits, small businesses, and micro businesses for weatherization, lighting, and electrification measures (Statewide Plan, Exh. 1, App. G.1, at 3; Exh. Compact-5 (4th Rev.)).[159] The Compact proposes these enhancements after the C&I Small Business Nonparticipant Customer Profile Study identified several of these customer classes as having historically lower participation rates in the energy efficiency programs (Exh. Compact-2, at 142).

3. Positions of the Parties

a. Cape Light Compact

The Compact argues that its proposed enhanced incentives are within the scope of its statutory authority to design programming to serve the interests of customers in its member municipalities (Program Administrators Brief at 105, 106, citing G.L. c. 164, § 134(b)). The Compact maintains that these enhanced incentives are consistent with the Green

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159 The Statewide Plan offers up to 70 percent incentives for the same measures (Exh. Compact-2, at 132).

Communities Act and were reviewed and approved by the Council (Program Administrators Brief at 105, 106). The Compact further contends that all applicable programs remain cost-effective with the enhanced incentives (Program Administrators Brief at 105, 106, citing Exhs. Compact-2, at 142-143; Compact-4, Table IV.D.1).

The Compact states that the iteration of the proposed CVEO presented in this Three-Year Plan maintains as many program design elements and input assumptions as possible from the CVEO proposal set forth in D.P.U. 20-40, given the significant stakeholder engagement and feedback that went into that proposal (Program Administrators Brief at 98, citing Exh. Compact-2, at 135-137). The Compact argues that the Legislature amended the Green Communities Act to allow Program Administrators to offer additional programs, including strategic electrification measures designed to result in cost-effective reductions in GHG emissions and programs that result in customers switching to renewable energy sources or other clean energy technologies (Program Administrators Brief at 99, citing G.L. c. 25, § 21(b)(2)). The Compact submits that the Department should approve the proposed CVEO for the 2022-2024 Three-Year Plan term because: (1) it is consistent with the Green Communities Act and the Department's desire for innovation in programming; (2) it does not conflict with the Legislative intent in establishing the SMART Program; (3) it is aligned with the Council's priorities; and (4) it is aligned with the intent of the Climate Act (Program Administrators Brief at 99-104).

The Compact acknowledges that the installation of heat pumps and battery energy storage are already incentivized by the Program Administrators but the proposed installation

of solar PV through energy efficiency programs is new (Program Administrators Brief at 99, citing Exh. Compact-1, generally and at 105, 115; Tr. 4, at 635-636). However, the Compact argues that its proposal to incentivize solar PV falls squarely within the ambit of programming now authorized by the Green Communities Act because the proposed CVEO is a program that results in "customers switching to renewable energy sources or other clean energy technologies" (Program Administrators Brief at 99, citing G.L. c. 25, § 21(b)(2)).

The Compact characterizes the CVEO as a complement to the SMART Program and argues nowhere has the Legislature evinced a desire to terminate or eliminate the use of incentives for solar PV across the Commonwealth (Program Administrators Brief at 102, citing An Act Relative to Solar Energy, St. 2016, c. 75, § 11(b)). Further, the Compact argues that the proposed CVEO is a limited and targeted offering with a maximum of 250 customers participating over the Three-Year Plan term (Program Administrators Brief at 102, citing Exh. Compact-9, at 2; Tr. 4, at 638-639).

In sum, the Compact asserts that: (1) the proposed CVEO budget is reasonable and designed to maximize use of federal and state outside funding to minimize costs to participants and costs collected from ratepayers through the EES; (2) the CVEO will provide annual electric savings for participants and reduce the subsidy non-income-eligible customers absorb to support income-eligible customers' electric rates; and (3) the technologies are consistent with the strategic electrification programming the Legislature directly authorized Program Administrators to pursue (Program Administrators Brief at 103, citing Exh. Compact-9, at 17-19, 22; 2019-2021 Three-Year Plans Order, at 154).

b. Attorney General

The Attorney General argues that the Compact's proposed Statewide Plan enhancements are consistent with the Green Communities Act and are designed to better serve customer groups that have been identified as high priorities during the 2022-2024 Three-Year Plan term (Attorney General Brief at 25). In addition, The Attorney General argues that the Department should approve the proposed CVEO and budget as part of the Compact's 2022-2024 Three-Year Plan (Attorney General Brief at 30).

The Attorney General maintains that the proposed CVEO is designed to address several significant environmental and economic concerns (Attorney General Brief at 27). The Attorney General contends that the Department's Order in D.P.U. 20-40 denying the CVEO as a matter of law construes the energy efficiency funding statute too narrowly (Attorney General Brief at 28). The Attorney General further asserts that the Department's Order in D.P.U. 20-40 does not fully capture the breadth of changes the Energy Act of 2018 made to the Green Communities Act (Attorney General Brief at 29, citing St. 2018, c. 227). The Attorney General maintains that the proposed CVEO does not support stand-alone solar PV, but only solar PV when it is paired with battery energy storage and heat pumps (Attorney General Brief at 29). The Attorney General argues that all three components of the proposed CVEO are required to deliver a cost-effective, affordable, clean heating alternative that is designed to address the substantial financial barriers faced by low- and moderate-income households and takes maximum advantage of "renewable energy [and] other clean energy

technologies" as permitted by law (Attorney General Brief at 29-30, citing G.L. c. 25, § 21(b)(2), as amended by the Energy Act of 2018).

c. Department of Energy Resources

DOER states that it takes no position on the proposed CVEO component of the Compact's Three-Year Plan (DOER Reply Brief at 7, n.34). DOER does, however, support the Compact's other enhancements to the Statewide Plan (DOER Reply Brief at 7, citing Statewide Plan, Exh. 1, App. N at 8-9).

d. Acadia Center

Acadia argues that the Department should approve the Compact's Three-Year Plan, including the proposed CVEO, as consistent with the Green Communities Act (Acadia Brief at 18, 21). Acadia asserts that the proposed CVEO is an integral part of delivering all cost-effective energy efficiency and demand resources (Acadia Brief at 20). Finally, Acadia maintains that the Compact's proposed enhanced incentives for battery energy storage and the other bundled CVEO technologies, together with the rest of the residential sector, meet the statutory threshold as cost-effective (Acadia Brief at 20).

e. Conservation Law Foundation

CLF argues that it supports the proposed CVEO generally as part of the Program Administrators' efforts to electrify fossil fuel appliances (CLF Brief at 51). CLF expresses its support for the Program Administrators' plans to work with manufacturers and installation contractors, and concludes that implementing and using heat pumps and increasing overall

electrification will help the Commonwealth achieve its net-zero goals and reduce expenses for customers (CLF Brief at 52).

f. Northeast Clean Energy Council

NECEC supports the proposed CVEO and argues that strategic electrification and customer-sited renewable energy generation are energy efficiency or demand reduction resources within the meaning G.L. c. 25, § 21 (NECEC Brief at 23). NECEC further argues that the proposed CVEO and, in particular, the proposed inclusion of solar PV as an energy efficiency program funded through the Compact's Three-Year Plan, is supported by the plain language, holistic view, and legislative history of the Commonwealth's various energy statutes (NECEC Brief at 22, 32, citing G.L. c. 25, § 21; St. 2021, c. 8; St. 2018, c. 227; St. 2016, c. 75).

NECEC argues that there is no statutory bar to including solar PV in the proposed CVEO or the Three-Year Plans, generally (NECEC Brief at 26). In this regard, NECEC asserts that the 2016 Act Relative to Solar Energy, St. 2016, c. 75, does not preclude the Compact from including customer-sited solar PV in the proposed CVEO and the Legislature intended to include solar PV and other renewable energy generation resources as eligible measures within the Three-Year Plans (NECEC Brief at 26).

NECEC maintains that the proposed CVEO will help to transition low- and moderate-income residential customers to a renewable energy resource, strategically electrify, and reduce GHG emissions (NECEC Brief at 32). Finally, NECEC argues that because the proposed CVEO is limited to 250 customers, it will provide an opportunity for the Program

Administrators to develop best practices for transitioning all customers to electrification and, in particular, low- and moderate-income customers who have historically under-participated in many energy efficiency programs (NECEC Brief at 32).

4. Analysis and Findings

a. Introduction

As part of its 2022-2024 Three-Year Plan, the Compact proposes to offer several enhancements to the Statewide Plan pursuant to G.L. c. 164, § 134(b). The Compact's proposed enhancements to the Statewide Plan generally take the form of enhanced incentives at levels that are materially different from the Statewide Plan (see, e.g., Statewide Plan, Exh. 1, App. G.1).

The Department must consider the proposed Statewide Plan enhancements in the context of the comprehensive statutory scheme for energy efficiency provided by the Green Communities Act.[160] The Department's review must ensure, among other things, that the

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[160] There is no question that the Compact's Three-Year Plan, though authorized by G.L. c. 164, § 134, is subject to the standards set forth in G.L. c. 25, §§ 19, 21-22 for the development and evaluation of energy efficiency plans. Chapter 25, § 21 explicitly applies to certified energy plans by municipal aggregators under G.L. c. 164, § 134. Even without an express connection between the statutes, the Legislature is presumed to be aware of existing legislation when enacting subsequent legislation and, therefore, statutes are interpreted to form a consistent body of law. See Parris v. Sheriff of Suffolk County, 93 Mass. App. Ct. 864, 868 (2018) (citations omitted). In 2008, the Green Communities Act amended G.L. c. 25 to add Sections 19, 21-22, which created the Council and established a comprehensive—and extremely effective—statewide statutory scheme aimed at maximizing energy efficiency in the Commonwealth. See G.L. c. 25, § 19, 21-22. As we have previously found, the purpose of the Green Communities Act was to "provide forthwith for renewable and alternative energy and energy efficiency in the

Compact's proposed enhancements to the Statewide Plan comply with all ratepayer protections in the Green Communities Act regarding cost effectiveness, funding, and bill impacts. G.L. c. 25, § 21(a), (b)(1), (b)(2)(iv). Customers within the Compact's member municipalities may opt out of participation in the Compact's municipal aggregation program, but they may not opt out of having the Compact as their energy efficiency Program Administrator. The Compact relies on the funds authorized by G.L. c. 25, § 19 to support its energy efficiency programs. In addition to the other requirements of the Green Communities Act, the Department must ensure that the Compact spends its energy efficiency funds in a reasonable and prudent manner when implementing its three-year plans, just as we do for the other Program Administrators.[161] Accordingly, our review of the Compact's

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[C]ommonwealth . . . ." Paragon Holdings, LLC, D.P.U. 14-119, at 4 (2014), citing Green Communities Act at Preamble. The Department must construe statutes that address the same subject matter harmoniously, "so that effect is given to every provision in all of them," Green v. Wyman-Gordon Company, 422 Mass. 551, 554 (1996), and the statutes do not "undercut each other." Burbank Apartments Tenant Association v. Kargman, 474 Mass. 107, 124-125 (2016). The Preamble to the Electric Restructuring Act of 1997, St. 1997, c. 164 ("Restructuring Act"), which created G.L. c. 164, § 134, states, in part, that one of "the primary elements of a more competitive electricity market will be . . . enhanced environmental protection goals." Restructuring Act at Preamble. Read together, these statutes evince the Legislature's intent to unify energy efficiency strategies and goals in the Commonwealth, which has resulted in Massachusetts leading the country in energy efficiency.

161 The Compact is not eligible to collect performance incentives, which provide an incentive for the other Program Administrators to maximize benefits while minimizing ratepayer costs. See, e.g., 2019-2021 Three-Year Plans Order, at 76.

proposed enhancements to the Statewide Plan requires the Department to protect ratepayer interests.

b. Cape and Vineyard Electrification Offering

The Department received comments from several intervenors and a limited participant regarding the Compact's CVEO proposal. The Department has rejected an almost identical CVEO proposal in its Order in D.P.U. 20-40-A because, in addition to other deficiencies, the manner of funding for the proposed CVEO is contrary to the laws of the Commonwealth and, therefore, cannot be approved as an enhancement to the Statewide Plan under G.L. c. 164, § 134, which findings the Compact has appealed to the Supreme Judicial Court.[162] For the reasons set forth in D.P.U. 20-40-A and below, the Department finds the proposed CVEO in the Compact's 2022-2024 Three-Year Plan is inconsistent with the requirements of G.L. c. 25, §§ 19, 21, and therefore, cannot be approved as an enhancement to the Statewide Plan or funded pursuant to G.L. c. 25, § 19.

Each Three-Year Plan "shall provide for the acquisition of all available energy efficiency and demand reduction resources." G.L. c. 25, § 21(b)(1). Investments in energy efficiency through the Green Communities Act result in long-term benefits of reduced energy consumption and reduced costs for the lives of the energy efficiency measures installed. See, e.g., 2019-2021 Three-Year Plans Order, at 109, citing D.P.U. 08-50-A at 58; 2010-2012 Electric Three-Year Plans Order, at 88; 2010-2012 Gas Three-Year Energy Plans

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[162] The appeal has been docketed as SJ-2021-0443.

Order, at 74. The passage of the Energy Act of 2018 and the Climate Act did not change the focus of the Green Communities Act in that regard. The Compact and other commenters rely on the Energy Act of 2018's addition of clause (J) to G.L. c. 25, § 21(b)(2)(iv) in arguing that the solar PV component of the proposed CVEO is authorized by the Green Communities Act (Program Administrators Brief at 99; see, e.g., Acadia Brief at 19; NECEC Brief at 24). That section and clause provide: A[n efficiency investment] plan shall include: . . . (iv) a description of programs, which may include, but which shall not be limited to: . . . (J) programs that result in customers switching to renewable energy sources or other clean energy technologies[.] G.L. c. 25, § 21(b)(2)(iv)(J). The Compact and others claim that solar PV is a "renewable energy source" that customers can "switch to" as part of the proposed CVEO within the Compact's Three-Year Plan (Program Administrators Brief at 99-100; see, e.g., Acadia Brief at 19; NECEC Brief at 24).

Such a reading of the Green Communities Act ignores the plain meaning of the statute and purpose of the programs to be included in a three-year energy efficiency plan, which is to be part of the acquisition of all available energy efficiency and demand reduction resources. G.L. c. 25, § 21(b)(1).[163] When interpreting a statute, the "statutory language

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163 The Program Administrators acknowledge this in testimony when asked about low-carbon fuels. The Program Administrators testified that "because [low-carbon fuels] on their own do not lead to a reduction in customer energy consumption or demand, they would not qualify as an energy efficiency measure" (Tr. 1, at 77). Although supportive of the proposed CVEO, Acadia also argues that "[b]y statute, the energy efficiency measures included in the Three-Year Plan must focus on a reduction of electric or natural gas demand or consumption in the Commonwealth" (Acadia Reply Brief at 2, citing Tr. 1, at 77; G.L. c. 25, § 21(a)). CLF also acknowledges

should be given effect consistent with its plain meaning and in light of the aim of the Legislature unless to do so would achieve an illogical result." Welch v. Sudbury Youth Soccer Assoc., Inc., 453 Mass. 352, 354-355 (2009), quoting Sullivan v. Brookline, 435 Mass. 353, 360 (2001). General Laws c. 25, § 21(b)(2)(iv)(J) allows Program Administrators to offer customers incentives to switch from a technology that uses one fuel source to a technology that uses renewable energy or clean energy in order to achieve energy savings under the energy efficiency investment plan.

General Laws c. 25, § 21(b)(2) provides a list of the types of energy efficiency or demand reduction programs that may be included in an energy efficiency plan, rather than authorization to include different types of programs. Said another way, the Green Communities Act states that the Program Administrators may offer an energy efficiency program that results in customers switching to a renewable energy technology, but the law does not authorize deployment of a renewable generation source simply because it is a renewable energy technology. Not all adoptions of renewable energy constitute energy efficiency because not all uses of renewable energy will reduce consumption for energy efficiency savings. As the Department has previously found, solar PV is an energy generating electrical system that does not seek to lower a customer's consumption, but rather

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this required component of the Three-Year Plans when it urges approval because, in part, the Three-Year Plans reduce energy consumption and demand (CLF Reply Brief at 4).

it is an alternative means of satisfying a customer's electrical consumption levels with renewable energy.[164] D.P.U. 20-40-A at 21.

As discussed above, in the context of the Green Communities Act, as amended by the Climate Act, energy efficiency measures reduce a customer's behind-the-meter consumption, lowering energy demand and GHG emissions. Accordingly, there is both an energy efficient and directional component to the switches authorized by the Green Communities Act. The Act authorizes switching from a non-renewable energy technology to a renewable energy technology that lowers overall energy use. However, the Act does not allow programs that incentivize, for example, switching from an air source heat pump to a fossil fuel heating system, even if the switch would result in energy savings.

Further, the solar PV component of the proposed CVEO does not constitute a "switch" where a customer changes the one fuel source of an end use to another fuel. A customer installing solar PV is changing the source of their electricity, not switching to a completely different fuel source like a customer switching from an oil heating system to an air source heat pump, solar hot water heater, or wood pellet stove. Accordingly, the

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164 Even though the Attorney General supports CVEO, her argument implies that the statute should not be construed to allow blanket switching to renewable energy generation (like stand-alone solar PV) funded with energy efficiency funds (see Attorney General Brief at 29). The Attorney General argues that the statute should allow solar PV as a program "that result[s] in customers switching to renewable energy sources" under G.L. c. 25, § 21(b)(2)(iv)(J), if it is co-delivered with a different program that lowers energy use under G.L. c. 25, § 21(b)(2)(iv)(A) (Attorney General Brief at 29-30). This argument attempts to rewrite the statute to create contingencies between separate programs in order to justify a measure that does not meet the requirements of the law.

Department finds that solar PV is not an energy efficiency resource, and any use of solar PV as an alternative means of electricity is not a "switch to renewable energy" for purposes of the Green Communities Act.[165] If energy efficiency funds were allowed to incentivize renewable energy generation, such as a solar PV installation, as advanced by the Compact, then a Program Administrator would also be able to use energy efficiency funds to incentivize a customer's on-site wind generation, biomass plant, or nuclear power, which would be an absurd use of energy efficiency funds.[166] After all, the Green Communities Act does not call for all cost-effective renewable energy resources.

The Legislature has established specific solar incentive and renewable energy programs to foster the development of renewable energy in the Commonwealth. Pursuant to Section 11(b) of an Act Relative to Solar Energy, St. 2016, c. 75, as amended by the Climate Act, DOER is charged with developing the SMART Program, which is the solar PV

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165 The Department notes that this conclusion is consistent with the Department's determination, in Section IV.D.3.f. above, that customers switching to biofuels may constitute a switch to a low GHG emission renewable energy source but the measure does not lead to a reduction in energy consumption within the context of the Green Communities Act.

166 The Legislature's intent must be ascertained from all of the Green Communities Act's words, as amended, "construed by the ordinary and approved usage of the language" and "considered in connection with the cause of its enactment, the mischief or imperfection to be remedied and the main object to be accomplished." Harvard Crimson, Inc. v. President & Fellows of Harvard College, 445 Mass. 745, 749 (2006). Plain and unambiguous statutory language is "conclusive as to legislative intent," but we will not adopt a literal construction where the consequences would be "absurd or unreasonable" and could not be what the Legislature intended. Sharris v. Commonwealth, 480 Mass. 586, 594 (2018), quoting Attorney General v. School Committee of Essex, 387 Mass. 326, 336 (1982).

incentive program for the Commonwealth funded by electric ratepayers through a tariff approved by the Department. The Compact seeks to establish an additional solar PV incentive program to provide incentives in addition to the SMART Program under the guise of the energy efficiency programs. Interpreting the Green Communities Act to allow Program Administrators to create additional solar PV incentives undercuts the Legislature's clear intent to have DOER design a ratepayer solar incentive program (i.e., SMART) that "promotes the orderly transition to a stable and self-sustaining solar PV market at a reasonable cost to ratepayers." St. 2016, c. 75, §§ 11(a)-(b). The SMART Program, consistent with Section 94 of the Climate Act, also provides for a carve out for low-income customers and low-income communities, upon which the proposed CVEO impedes in also offering incentives to income-eligible participants. Interpreting G.L. c. 25, § 21(b)(2)(iv)(J) as an expansion of the energy efficiency programs to allow a new solar incentive program, as an alternate to the SMART Program or other clearly defined solar programs, is contrary to the Commonwealth's statutory framework.

Additionally, not every GHG emissions reduction goal under the Climate Act fits within the energy efficiency programs under G.L. c. 25, § 21. If they did, the Program Administrators could use energy efficiency funds to pay for offshore wind (as a renewable energy source), electric vehicles (as a strategic electrification measure), carbon capture (as a clean energy technology), or any other program that reduces GHG emissions. The Climate Act establishes that a portion of the Commonwealth's GHG emissions reduction goals should be achieved through energy efficiency and that goal has been set by the EEA Secretary

(Statewide Plan, Exh. 1, App. D). Use of non-energy efficiency measures to reach energy efficiency goals would create an imbalance among the other goals set by the EEA Secretary. Therefore, the claim that the proposed CVEO should be approved simply because it helps achieve climate goals is a red herring (see, e.g., NECEC Brief at 30-32).

The Attorney General and NECEC support the limited nature of the proposed CVEO applauding its focus on 250 income-eligible and moderate income customers, but it is the focus on this small group of customers that causes additional concerns. The proposed CVEO is inconsistent with the Green Communities Act because it is a limited offering to 250 income-eligible and moderate income participants. Nothing in the Green Communities Act permits pursuit of all available cost-effective energy efficiency for a select, limited number of customers. Any cost-effective measure pursued must be available to all similarly situated customers of the Program Administrator. Further, even if the CVEO proposal were consistent with applicable law, the Department still has strong concerns regarding the resulting bill impacts, which are significant though there are only 250 participants out of more than 200,000 customers served (Exh. Compact-6 (4th Rev.), Bill Impact Summary). See Cape Light Compact, D.P.U. 14-69, Petition, Exh. A at 3. For the foregoing reasons and those set forth in D.P.U. 20-40-A, the Department denies implementation of the CVEO in the Compact's 2022-2024 Three-Year Energy Efficiency Plan.

Nevertheless, as the Department has previously stated in D.P.U. 20-40-A at 23-24, there is great value in marketing the co-delivery of existing solar incentives to reduce energy bills, which delivers on the intent and goals of the Green Communities Act. As discussed

above in Section IV.D.3.b, the Department is concerned about the potential bill impacts of strategic electrification, particularly for low- and moderate income customers. As the Attorney General suggests, co-delivering strategic electrification offerings under the Green Communities Act with solar incentive programs, such as the SMART Program, is a strategy the Program Administrators should explore as a means of minimizing ratepayer costs under their strategic electrification offerings. A co-delivery model would be consistent with the Climate Act and the Commonwealth's energy and environmental goals, by encouraging the simultaneous electrification and decarbonization of the electric grid.

Accordingly, the Department directs the Program Administrators to explore the development of a co-delivery strategy that markets energy efficiency and solar PV for potential inclusion in their 2025-2027 Three-Year Plans. The strategy must comport with the open, competitive solar PV market, as well as the Green Communities Act, and Department rules and regulations. Any SMART Program incentive provided for the solar PV market should be compliant with any applicable DOER regulations or guidelines governing the solar program and St. 2016, c. 75. The Program Administrators shall file an update on the research and development of this strategy in their Plan-Year Reports.

c. Other Statewide Plan Enhancements

The Department has reviewed the Compact's remaining enhanced incentive proposals: (1) incentives up to 100 percent for income-eligible and moderate income residential multifamily new construction projects installing weatherization measures above code and installing and maintaining heat pumps (Exh. Compact-2, at 139-140); and (2) incentives up to

100 percent for C&I customers, including municipal customers, small non-profits, small businesses, and microbusinesses, installing weatherization, lighting, and electrification measures (Statewide Plan, Exh. 1, App. G.1, at 3). The residential proposed enhanced incentives are new and the C&I proposed enhancements are consistent with past program design implemented by the Compact (Statewide Plan, Exh. 1, App. G.1 – Cape Light Compact). 2019-2022 Three-Year Plans Order, D.P.U. 18-110 through D.P.U. 18-119, Petition, Statewide Plan, Exh. 1, App. K (October 31, 2018). The Compact has not obtained any outside funding for these Statewide Plan enhancements. The Compact proposes to collect all costs related to these Plan enhancements from electric ratepayers through its EES (Exhs. Compact-2, at 115, 144; Compact-4 (Rev.) at 3). After review, the Department approves the Compact's proposed residential multifamily new construction and C&I existing buildings[167] enhancements to the Statewide Plan pursuant to G.L. c. 164, § 134(b).

However, the Department questions the continued reasonableness of the increased incentive levels offered by the Compact without a study demonstrating the prudence of, and need for, such increased incentives. Program experience alone is insufficient to warrant consistently greater incentives compared to statewide levels, as high as 100 percent of the total cost (Exh. DPU-Compact 1-14). Prior to the filing of this Three-Year Plan, the Department directed the Compact to conduct an analysis of its enhanced incentives approved in the 2019-2021 Three-Year Plans Order "through the statewide evaluation protocols to

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[167] The Department directs the Compact, in its annual report, to identify with specificity who qualifies for the C&I existing buildings incentives.

determine if these enhanced incentives (including incentive levels) continue to be warranted." 2019-2021 Three-Year Plans Order, at 126. The Compact did not complete the required study prior to filing its Three-Year Plan as directed and, instead, indicated a completion date of the study well beyond the closing of the record in this matter (Exh. Compact-2, at 130).

In this Three-Year Plan filing, the Department directed the Compact to set forth the incremental budget of its enhancements relative to the Statewide Plan. 2019-2021 Three-Year Plans Order, at 132-133. The Compact testified that the incremental incentives budget of its residential multifamily new construction enhancement is $8.7 million and that of its C&I existing buildings enhancement is $4.7 million (Exh. Compact-2, at 141, 144). The Compact's total budget for residential new construction is $13.6 million and for C&I existing buildings is $38.7 million (Exh. Compact-4 (4th Rev.), at 12). Therefore, the Compact's residential new construction enhancement incentives constitute 64 percent of the Compact's budget for that program. It is unclear that this substantially increased incentive translates to substantially increased participation without the study the Department previously ordered. Though much less of a difference between the Compact's total budget for C&I existing buildings ($38.7 million) and its total budget without enhancements ($34 million), it remains unclear whether this additional incentive is necessary to ensure C&I participation without study. The Department is concerned about the budget impacts of the Compact's enhancements and the lack of evidence demonstrating the reasonableness and prudence of the enhancements.

As stated above, the Department allows the Compact to move forward with its residential new construction and C&I existing buildings enhancements, but makes no substantive findings on the prudence of these incentive levels at this time. The Department again directs the Compact to complete prior to the filing of its 2025-2027 Three-Year Plan, and file with its 2025-2027 Three-Year Plan, an analysis of its enhanced incentives approved herein through the statewide evaluation protocols to determine if these enhanced incentives, including incentive levels, are warranted and necessary to drive participation levels. One aspect of the evaluation should consider the participation rates of comparable customer groups receiving similar services with lower incentive levels. If the Compact is unable to justify its greater incentive levels, the Department will consider this when assessing the certification of the Compact's energy efficiency plan in the future. See Section XI.E., below.

The Department reiterates that in all future Three-Year Plan filings the Compact must fully support any enhanced incentive proposals with testimony and exhibits (1) describing each proposed Statewide Plan enhancement; (2) explaining and supporting why each proposed enhancement is necessary and consistent with all requirements of the Green Communities Act; (3) describing Council and stakeholder review of each proposal; and (4) clearly identifying the incremental budget and projected savings, broken down by rate class and category, relative to the Statewide Plan. 2019-2021 Three-Year Plans Order, at 132-133. The Department further directs the Compact in future Three-Year Plan filings to provide a listing of each measure in the BCR model that is receiving an incentive higher than the

Statewide Plan. In such listing, the Compact should retain the attendant column data (e.g., sector, program, core initiative, BCR measure ID, incentive, etc.).

C. Provision of Energy Efficiency Services to Mutual Customers

1. Introduction

National Grid (gas) provides gas distribution service to all customers in its service territory across Cape Cod.[168] Additionally, National Grid (gas) administers gas energy efficiency programs for its customers pursuant to its Department-approved three-year energy efficiency plan. G.L. c. 25, §§ 19(b), 21(b)-(d). As we have noted above, the Compact is an authorized municipal aggregator for 21 towns on Cape Cod and Dukes County. See G.L. c. 164, § 134(a); Cape Light Compact, D.T.E. 00-47 (2000) (approving the Compact's initial municipal aggregation plan). As a municipal aggregator, the Compact purchases electricity supply on behalf of eligible customers in its member municipalities who have not opted out of the Compact's municipal aggregation program. The Compact also has received Department approval to act as an energy efficiency Program Administrator for all electric customers in its member municipalities, including those electric customers who have opted out of the Compact's municipal aggregation program. G.L. c. 25, §§ 19(a), 21(b)-(d); G.L. c. 164, § 134(b); Cape Light Compact, D.T.E. 00-47-C (2001).

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168 National Grid (gas) provides gas distribution service to the following towns on Cape Cod: Barnstable, Bourne, Brewster, Chatham, Dennis, Eastham, Falmouth, Harwich, Mashpee, Orleans, Sandwich, Wareham, and Yarmouth.

Because National Grid (gas) and the Compact have overlapping service areas on Cape Cod, certain customers may be eligible for energy efficiency services as a gas customer of National Grid (gas) and as an electric customer in the communities the Compact is authorized to provide energy efficiency services to pursuant to D.T.E. 00-47-C ("Mutual Customers").[169] Since the 2016-2018 Three-Year Plans proceeding, the Compact and National Grid (gas) have proffered differing solutions to the question of how best to serve Mutual Customers in a manner consistent with applicable law and have engaged in unsuccessful negotiations to reach an agreement amenable to both (Exhs. DPU-National Grid (gas)-1, DPU-Compact 2-13(a)). 2016-2018 Three-Year Plans Order, at 116-118; 2019-2021 Three-Year Plans Order, at 143-146. When National Grid (gas) and the Compact were unable to negotiate a final resolution of these issues, National Grid (gas) petitioned the Department to resolve the dispute, which the Department docketed as D.P.U. 16-169. That docket remains open and a final resolution of these issues will occur there. Below, the Department addresses the service of Mutual Customers by National Grid (gas) and the Compact during the interim period.

2. Background

In its 2016-2018 Three-Year Plan filing, the Compact stated that it had been administering its residential energy efficiency programs in a fuel-neutral manner since the

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169 The Department notes that this circumstance is not unique to the Compact's service area. There are numerous instances where a gas Program Administrator and an electric Program Administrator each offer energy efficiency programs in the same municipality.

Department approved its initial energy efficiency plan in 2001, which included serving National Grid (gas) customers who heat their homes with natural gas but, nonetheless, chose to participate in the Compact's energy efficiency programs. 2016-2018 Three-Year Plans Order, at 116. National Grid (gas) asserted that the Compact's practice of serving Mutual Customers could result in the Compact using its electric energy efficiency funds to subsidize the gas energy efficiency services that would otherwise be provided by National Grid (gas). 2016-2018 Three-Year Plans Order, at 116-117. On December 2, 2015, the Compact and National Grid (gas) filed an interim agreement that addressed the joint administration of energy efficiency services to residential Mutual Customers. The Compact and National Grid (gas) represented that they would continue to negotiate a final agreement that would resolve the Mutual Customer issue (Exh. DPU-National Grid (Gas)-1, at 1).[170] 2016-2018 Three-Year Plans Order, at 117-118. At the Compact's request, while negotiations for a final agreement were ongoing, National Grid (gas) entered into a contract with the Compact's home energy services lead vendor to provide gas energy efficiency services on Cape Cod effective February 1, 2016 (Exh. DPU-National Grid (Gas)-1, at 1).

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170 The interim agreement provided that the Compact and National Grid (gas) would contract with a joint lead vendor to provide energy efficiency services to Mutual Customers. The joint lead vendor would bill National Grid (gas) or the Compact, as applicable, for energy efficiency services provided to gas customers; National Grid (gas) would claim gas savings and the Compact would claim savings from electricity and other fuels. National Grid (gas) would provide gas customers incentives consistent with its approved programs. The agreement further provided that the Compact and National Grid (gas) would negotiate a more detailed final agreement by January 31, 2016. 2016-2018 Three-Year Plans Order, at 117-118.

Despite some nine months of further negotiations, National Grid (gas) and the Compact were unable to reach a final agreement and on October 5, 2016, National Grid (gas) filed its petition in D.P.U. 16-169 with the Department (Exh. DPU-National Grid (Gas)-1, at 1). D.P.U. 16-169, Petition at 3 (October 5, 2016).[171]

Pending final resolution of these issues, National Grid (gas) and the Compact have continued to use the same lead vendor for energy assessments and implementing weatherization installations for Mutual Customers (Exh. DPU-National Grid (Gas)-1, at 1). Currently, when customers who heat their homes with natural gas enter the Residential Coordinated Delivery initiative from the National Grid (gas) pathway (i.e., directly contacting National Grid (gas) or Mass Save[172]) those customers are served through the shared lead vendor (Exhs. DPU-National Grid (Gas)-1, at 1; DPU-Compact 2-13, at 2). In this circumstance, National Grid (gas) claims all gas savings (and pays all associated costs) and refers any secondary electric savings (and associated costs) to be claimed by the Compact (Exhs. DPU-National Grid (Gas)-1, at 1-2; DPU-Compact 2-13, at 2). Conversely, when a customer who heats with natural gas enters the program through the Compact's pathway

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171 In its review of the 2019-2021 Three-Year Plans, the Department found that certain issues raised by National Grid (gas) shared common questions of law and fact with issues pending in D.P.U. 16-169. Given the complex nature of those questions, the Department determined it would address these issues comprehensively in D.P.U. 16-169. 2019-2021 Three-Year Plans Order, at 146.

172 Mass Save is a registered word service mark the Program Administrators use to jointly market their energy efficiency programs statewide (Statewide Plan, Exh. 1, at 184). The Program Administrators jointly operate a website and central telephone number under the brand "Mass Save" (Statewide Plan, Exh. 1, at 183).

(i.e., directly contacting the Compact), that customer is served as a Compact customer and the Compact does not send any gas savings derived from natural gas measures to National Grid (gas) (Exhs. DPU-National Grid (Gas)-1 at 2; DPU-Compact 2-13, at 2). In this circumstance, gas savings and program costs are claimed and paid for by the Compact through its EES (Exh. DPU-National Grid (Gas)-1, at 2).

National Grid (gas) proposes to serve Mutual Customers with the Compact for the 2022-2024 Three-Year Plan term in the same manner as it does with other Program Administrators when there are mutual customers (Exh. DPU-National Grid (Gas)-1, at 2). More specifically, National Grid (gas) proposes that if the Mutual Customer is a gas heating customer, National Grid (gas) would take the lead on providing the energy efficiency measures, claim and pay for any gas savings through its EES, and send any secondary electric savings to the Compact to be claimed and paid for through the Compact's EES (Exh. DPU-National Grid (Gas)-1, at 2). Conversely, the Compact proposes to continue to serve Mutual Customers with National Grid (gas) for the 2022-2024 Three-Year Plan term in the manner described above (Exh. DPU-Compact 2-13; Tr. 4, at 577-579).

3. Positions of the Parties

a. National Grid (gas)

National Grid (gas) argues that the continued practice of the Compact providing home energy assessments and weatherization measures to Mutual Customers who heat their homes with natural gas is inconsistent with the statewide coordination protocol that all other

Program Administrators follow[173] (National Grid (gas) Supplemental Brief at 1). National Grid (gas) contends that the savings claimed by the Compact in these instances are inconsistent with the savings claimed by other Program Administrators (National Grid (gas) Supplemental Brief at 1). National Grid (gas) argues that this practice inappropriately allows the Compact, an electric Program Administrator: (1) to pay for gas savings through its customers' electric bills (as opposed to the bills of the gas customers that realize system benefits from overall reductions in gas consumption and winter demand); and (2) to claim those gas savings and associated benefits through an electric energy efficiency plan (National Grid (gas) Supplemental Brief at 2).

National Grid (gas) asserts that the fact that the Compact is a municipal aggregator is not reason to support the implementation of energy efficiency services in a manner that is inconsistent with the coordinated statewide practice followed by all other Program Administrators (National Grid (gas) Supplemental Reply Brief at 1). In this regard, National Grid (gas) contends that it is the Department and the Council who have the responsibility of making energy efficiency policy decisions and not the Compact's Governing Board (National Grid (gas) Supplemental Reply Brief at 1, citing G.L. c. 25, §21 (b)(1)).

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[173] National Grid (gas) maintains that, with the exception of the Compact, the gas and electric Program Administrators coordinate to serve mutual customers based on the customer's primary heating fuel. For customers that heat with a fuel other than natural gas, the electric Program Administrator provides the in-home energy assessment. For customers that heat with natural gas, the gas Program Administrator provides the in-home energy assessment (National Grid (gas) Supplemental Brief at 1, citing Exh. AG-Comm 1-3).

National Grid (gas) disagrees with the Compact's classification of its weatherization measures as electric measures because, while the measures to be implemented under the Residential Coordinated Delivery program for the 2022-2024 Three-Year Plan term will be offered by both electric and gas Program Administrators, when these measures are done in a home heated by natural gas, the savings achieved are primarily related to the heating source (National Grid (gas) Supplemental Reply Brief at 2). National Grid (gas) maintains that these measures are appropriately provided by the gas Program Administrators and the long-held common understanding of these measures as "gas measures" in this scenario is consistent with how these measures are coordinated in all other service areas in Massachusetts where there are overlapping electric and gas customers (National Grid (gas) Supplemental Reply Brief at 2). National Grid (gas) contends that the Compact's current and proposed approach is inconsistent with how the measures are offered and savings are claimed among all other Program Administrators (National Grid (gas) Supplemental Reply Brief at 2). National Grid (gas) maintains that with the Compact's administration of these measures, gas heating customers are paying for measures through the EES of both the Compact and National Grid (gas) (National Grid (gas) Supplemental Reply Brief at 2).

National Grid (gas) disagrees with the Compact's assertion that Mutual Customers should have the opportunity to choose the Program Administrator from which they would obtain energy efficiency services (National Grid (gas) Supplemental Reply Brief at 2). National Grid (gas) argues that the Green Communities Act does not contemplate customers choosing their energy efficiency provider and, in this regard, the Compact is conflating a

customer's ability to choose their electric supplier, whether it be through a competitive supplier or a municipal aggregator, with the provision of energy efficiency services (National Grid (gas) Supplemental Reply Brief at 2). National Grid (gas) asserts the customer's entry point to receiving energy efficiency measures should not determine how the associated savings are allocated (National Grid (gas) Supplemental Reply Brief at 3). Because the Compact has indicated that it does not intend to change how it plans to serve Mutual Customers in its 2022-2024 Three-Year Plan, National Grid (gas) requests that the Department direct the Compact to follow the statewide coordination protocols in the administration of their 2022-2024 Three-Year Plan (National Grid (gas) Supplemental Brief at 2; National Grid (gas) Supplemental Reply Brief at 3).

b. Cape Light Compact

The Compact argues that its fuel-neutral program design means that where the service areas overlap, Mutual Customers can be served by the Compact if they so choose (Compact Supplemental Brief at 2). The Compact claims that Mutual Customers should be considered electric customers of the Compact (regardless of whether they participate in the Compact's municipal aggregation program) and the Compact is authorized to administer electric measures to all electric customers in its member municipalities pursuant to its Department-approved energy efficiency plan (Compact Supplemental Brief at 2). Nonetheless, the Compact maintains that if a Mutual Customer calls the Mass Save hotline, the customer will be served by National Grid (gas) (Compact Supplemental Brief at 2). According to the Compact, if a Mutual Customer desires to be served by the Compact, the

Compact should be able to serve that mutual customer under its approved energy efficiency plan (Compact Supplemental Brief at 2-3).

In response to National Grid (gas)'s request that the Department direct the Compact to follow the statewide coordination protocols, the Compact disagrees and argues that it has always served and continues to serve Mutual Customers who contact the Compact for service, consistent with the Department's original certification of the Compact's energy efficiency plan (Compact Supplemental Reply Brief at 2). The Compact maintains that continuing this practice, as proposed by the Compact for the 2022-2024 Three-Year Plan term, will result in customer choice and not confusion (Compact Supplemental Reply Brief at 2).

4. Analysis and Findings

As the Department has previously recognized, the provision of energy efficiency services to Mutual Customers under National Grid (gas)'s and the Compact's respective Three-Year Plans is complex and involves certain issues of law and fact common to those raised by National Grid (gas) in D.P.U. 16-169. 2019-2021 Three-Year Plans Order, at 146. In addressing this topic in the 2019-2021 Three-Year Plans Order, however, the Department acknowledged the importance of consistency in the delivery of energy efficiency services in areas where electric and gas Program Administrators have overlapping service territories, and specifically commended the efforts of Program Administrators to align incentive levels and caps so that all customers can benefit from the same experience statewide. 2019-2021 Three-Year Plans Order, at 146. The Department notes that we did not then, and

never have, approved the Compact's treatment of Mutual Customers or authorized an alternative approach to the statewide coordination protocol; rather, the Department has repeatedly emphasized the importance of consistency in the delivery of energy services in service areas where electric and gas Program Administrators have overlapping service territories. 2019-2021 Three-Year Plans Order, at 146, citing 2016-2018 Three-Year Plans Order, at 118. Given the lack of a more specific directive, however, the Compact continued its practice of providing energy efficiency services to Mutual Customers who heat their homes with gas, while all savings associated with such customers are paid for and claimed by the Compact (Exh. DPU-National Grid (Gas)-1; DPU-Compact 2-13, at 1-2).

In the instant proceeding, the Compact proposes to continue to provide energy efficiency services to Mutual Customers that heat with natural gas during the 2022-2024 Three-Year Plan term (Tr. 4, at 577). If the Compact wishes to continue to serve Mutual Customers who heat with natural gas, the Department finds that the Compact must adhere to the established statewide coordination protocols for shared costs and savings. This will ensure that all Program Administrators implement their 2022-2024 Three-Year Plans in a consistent manner with respect to how measures are installed, and savings are claimed among all other Program Administrators (Exh. DPU-National Grid (Gas)-1, at 2). This also will obviate any concern about the improper subsidization of energy efficiency programs for gas heating customers by electric ratepayers. This is an interim directive that will remain in place subject to the Department's final resolution of issues related to Mutual Customers in D.P.U. 16-169.

As noted above, National Grid (gas) and the Compact use the same lead vendor to perform home energy assessments and manage weatherization installations for Mutual Customers (Exh. DPU-National Grid (Gas)-1; Tr. 4, at 579-581). When National Grid (gas) provides weatherization measures to Mutual Customers that heat with natural gas, the weatherization work shall continue to be paid for and the savings claimed by National Grid (gas), and any related electric savings (and associated costs) shall continue to be sent to the Compact (Exh. DPU-National Grid (Gas)-1). If the Compact provides weatherization measures to Mutual Customers that heat with natural gas, it must follow the statewide coordination protocols for shared costs and savings. Gas savings from any weatherization measure must be sent to National Grid (gas) and paid for by National Grid (gas) customers. The Compact may keep any secondary electric and other fuel savings associated with these measures. Pending final adjudication of these issues in D.P.U. 16-169, National Grid (gas) will not be able to collect performance incentives for savings assigned to it from Compact-administered measures.

Finally, the Department finds that Mutual Customers should receive the same information when choosing to pursue weatherization measures, no matter which Program Administrator provides the information. Accordingly, National Grid (gas) and the Compact shall develop common education materials regarding weatherization, including a script for use by the lead vendor. The Compact and National Grid (gas) must submit a proposed timeline for developing these materials as part of their required compliance filings in these dockets.

D. Allocation of Shared Costs

1. Introduction

The Compact has two core functions: (1) administering approved energy efficiency programs; and (2) administering a municipal aggregation power supply program. 2019-2021 Three-Year Plans Order, at 142. Accordingly, there are a number of shared costs that the Compact must allocate between its energy efficiency and municipal aggregation programs. 2019-2021 Three-Year Plans Order, at 141. The Compact maintains separate budgets and accounts for its energy efficiency and municipal aggregation operations. D.P.U. 18-116, Exh. DPU-Compact 1-1 (November 19, 2018). Energy efficiency-related expenditures are funded through an EES collected from all electric customers in the Compact's service area, while municipal aggregation-related expenses are primarily funded through an operational adder collected from municipal aggregation program participants (Exh. Compact-2, at 144).[174] 2019-2021 Three-Year Plans Order, at 140. The Compact is required to maintain a series of internal controls to ensure that only energy efficiency-related costs (and no municipal aggregation-related or other costs) are recovered through the EES. 2019-2021 Three-Year Plans Order, at 140.

Certain costs that are indirect or shared between the Compact's municipal aggregation and energy efficiency functions must be allocated between the two functions based on

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[174] The Compact also may apply for funding from the Massachusetts Renewable Energy Trust Fund established pursuant to G.L. c. 23J, § 9, to support renewable energy programs under a certified energy plan pursuant to G.L. c. 164, § 134(b).

appropriate allocation factors. 2019-2021 Three-Year Plans Order, at 141-142. Examples of such shared costs include staff salaries, office space, and insurance. 2019-2021 Three-Year Plans Order, at 141 n.70.

2. Background

The Department addressed the allocation of shared costs in the 2019-2021 Three-Year Plans Order, where, with one exception, we approved these cost allocations for use in the 2019-2021 Three-Year Plans term. 2019-2021 Three-Year Plans Order, at 142, citing D.P.U. 18-116, Exh. DPU-Compact 3-1. In order to increase transparency and facilitate review of future EES and three-year plan filings, the Department directed the Compact to identify the proposed allocation methods and resulting allocation factors used to assign shared costs to its energy efficiency and municipal aggregation programs. 2019-2021 Three-Year Plans Order, at 142. We specifically directed that the Compact include in its Annual Reports and Term Reports a comparison of planned allocations versus actual spent dollars and an explanation of any significant variance (i.e., a variance of greater than ten percent). 2019-2021 Three-Year Plans Order, at 142. The Department also found that as to consumer advocacy costs, where the Compact classified any such costs as related to energy efficiency, it must be prepared to demonstrate that such activities have direct energy efficiency-related benefits. 2019-2021 Three-Year Plans Order, at 143. We further made clear that the Department expected that the "vast majority" of consumer advocacy costs should be allocated to and recovered through the municipal aggregation budget. 2019-2021 Three-Year Plans Order, at 143.

Subsequent to the issuance of the 2019-2021 Three-Year Plans Order, the Compact submitted to the Department its proposed 2020 EES filing, docketed as D.P.U. 19-136, in which the Compact incorporated proposed revised allocation factors adopted by its Governing Board in April 2019 (Exh. DPU-Compact 1-22).[175] Cape Light Compact JPE, D.P.U. 19-136, at 4 (2019). The Department determined that it did not have a sufficient basis in the record to evaluate the reasonableness of the Compact's proposed allocation factors. D.P.U. 19-136, at 5. The Department approved EES for 2020 (subject to reconciliation after investigation) using the allocation factors identified in the 2019-2021 Three-Year Plans. D.P.U. 19-136, at 5. The Department approved 2021 and 2022 EES using the same factors. Cape Light Compact JPE, D.P.U. 20-122, at 4-5 (2020); Cape Light Compact JPE, D.P.U. 21-119, at 7 (2021). In the 2022 EES proceeding, the Department noted that the Compact's shared cost allocation proposal for 2022-2024 was under review in this proceeding but declined to apply those proposed allocation factors to customer bills prior to full investigation in the instant docket. D.P.U. 21-119, at 7.

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175 The Compact states that its Governing Board adopted new allocation factors within three months of the issuance of the 2019-2021 Three-Year Plans Order, which broadly shifted a greater proportion of shared costs to the energy efficiency budget. (Exh. DPU-Compact 1-22). This included the proposed allocation of 70 percent of shared legal costs for consumer advocacy to its energy efficiency budget after the Department explicitly stated its expectation that the "vast majority" of such expenditures would not be allocated as such. In D.P.U. 19-136, at 5, the Department found it did not have a sufficient basis to approve the allocation of 70 percent of shared legal/consumer advocacy costs to the energy efficiency budget.

3. Compact Proposal

The Compact proposes that its Governing Board, as part of its role in setting the policies and procedures for the Compact's operations, should be permitted to determine how costs are shared between its municipal aggregation and energy efficiency functions (Exh. Compact-2, at 145). In this regard, the Compact states that its staff makes recommendations to the Governing Board regarding the annual allocation of shared costs, and the Governing Board deliberates and determines appropriate allocation factors (Exh. Compact-2, at 145). The Compact states that in an effort to maintain "transparency," it elected to propose a fixed percentage cost allocation for the vast majority of its shared costs over the entire 2022-2024 Three-Year Plans term based on the breakdown of staff salaries between its operating and energy efficiency budgets in 2021 (Tr. 4 at 556-558; Exh. DPU-Compact 1-22). Specifically, the Compact proposes to allocate 95 percent of its shared costs to its energy efficiency activities and five percent of its shared costs to its municipal aggregation operations in 2022-2024 (Exh. Compact-2, at 147).

The only shared costs for the 2022-2024 Three-Year Plan term that do not have a proposed fixed allocation factor based solely on the breakdown of staff salaries in 2021 are legal costs for consumer advocacy ("legal/consumer advocacy") and other shared legal costs (Exh. Compact-2, at 146). The Compact proposes to allocate these shared costs based on: (1) the subject matter of the legal service provided; or (2) the same fixed percentage breakdown tied to staff salaries as described above where the legal matter is employee-related (Exh. Compact-2, at 146). The Compact proposes to determine what allocation method to

use for these costs based on its Governing Board approvals of "consumer advocacy worksheets" detailing the nature of the consumer advocacy matters (Exh. Compact-2, at 146).

4. Positions of the Parties

a. Attorney General

The Attorney General argues that the Compact's proposed allocation methods are consistent with the Department's directives to transparently allocate shared costs between the Compact's municipal aggregation operating and energy efficiency budgets, while ensuring only energy efficiency-related costs are paid through the energy efficiency budget (Attorney General Brief at 26). The Attorney General maintains that there appears to be sufficient oversight of the Compact's actual cost allocations through the Governing Board review process and the Department's review of annual EES filings (Attorney General Brief at 26). Accordingly, the Attorney General supports the Compact's proposed allocation of shared costs as presented in its 2022-2024 Three-Year Plan filing (Attorney General Brief at 26).

b. Cape Light Compact

The Compact argues that it is appropriate for its Governing Board to determine the process for allocating expenses that are shared between the Compact's municipal aggregation and energy efficiency programs and report the allocation factors to the Department in its annual EES filing (Program Administrators Brief at 95). The Compact contends, in addition to the routine reporting of its energy efficiency expenditures to the Department, it appropriately identifies the allocation factors used to assign shared costs to its energy

efficiency and municipal aggregation programs (Program Administrators Brief at 96). Therefore, the Compact argues that the Department should approve its proposed shared cost allocation factors for 2022-2024 (Program Administrators Brief at 96).

5. Analysis and Findings

a. Introduction

The Compact is the only municipal aggregator and only non-investor-owned utility to function as an energy efficiency Program Administrator under the Green Communities Act. 2019-2021 Three-Year Plans Order, at 112. Customers in the Compact's member municipalities may opt out of participation in the Compact's municipal aggregation program, but they may not opt out of having the Compact as their energy efficiency Program Administrator. The Compact relies on funds collected from all electric ratepayers in the Compact's service area to support its energy efficiency programs. 2019-2021 Three-Year Plans Order, at 140. While the Governing Board may work with the Compact to develop a cost-allocation proposal, the Department must ensure that the Compact spends its ratepayer-provided energy efficiency funds in a reasonable and prudent manner, just as we do for all

other Program Administrators when implementing their energy efficiency plans.[176,177] 2019-2021 Three-Year Plans Order, at 125.

As a municipal aggregator also acting as a Program Administrator, the Compact essentially steps into the shoes of an investor-owned utility with regard to ratemaking; it must make the same energy efficiency-related rate recovery filings and is subject to the same standards of Department review.[178] The EES through which the Compact collects ratepayer funds is a mechanism of the Green Communities Act and subject to the Department's authority to regulate rates. See G.L. c. 25, §§ 19(a), 21(d)(2); D.P.U. 08-50-B at 35-36, 43 (2009); NSTAR Electric Company, D.P.U. 21-49, at 3-4 (2021). An EES is not a funding mechanism otherwise available to municipal aggregators pursuant to a municipal aggregation plan or G.L. c. 164, § 134(b).[179] It is a fully funded reconciling mechanism available to

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176 As we have stated previously, while the Compact is authorized to act as an energy efficiency Program Administrator pursuant to G.L. c. 164, § 134 and G.L. 25, § 19, there is no question that the Compact's three-year plans and related filings are subject to the standards set forth in G.L. c. 25, §§ 19-22 for the development and evaluation of energy efficiency plans. 2019-2021 Three-Year Plans Order, at 124-125 n.55.

177 The Compact's obligation to spend ratepayer funds in a reasonable and prudent manner is addressed further in Section XI.E., below.

178 As discussed in Section XI.E., below, one area where the Compact is unique among Program Administrators as a municipal entity is that it does not collect performance incentives, which provide other Program Administrators with an incentive to maximize benefits while minimizing ratepayer costs. 2019-2021 Three-Year Plans Order, at 125 n.56.

179 If such an energy plan is certified by the Department:

Program Administrators that allows for dollar-for-dollar recovery of approved energy efficiency costs from ratepayers, subject to Department oversight.[180] G.L. c. 25, § 21(d)(2). The Department ensures that all Program Administrators properly allocate costs to their energy efficiency programs. See, e.g., 2016-2018 Three-Year Plans Order, at 51; Grid Modernization, D.P.U. 20-69-A at 48-49 (2021).

The proper treatment of the allocation of shared costs between the Compact's energy efficiency and municipal aggregation operational budgets has been a consistent issue in numerous filings.[181] In addressing this issue for the 2022-2024 Three-Year Plan term, the

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> [T]he municipality or group of municipalities may apply to the Massachusetts clean energy technology center for monies from the Massachusetts Renewable Energy Trust Fund, established pursuant to section 9 of chapter 23J, and receive and, if approved, expend moneys from the demand side management system benefit charges or line charges in an amount not to exceed that contributed by retail customers within said municipality or group [of] municipalities. This will not prevent said municipality or municipalities from applying to the Massachusetts clean energy technology center for additional funds.
>
> G.L. c. 164, § 134(b).

180 Pursuant to the Green Communities Act, each Three-Year Plan must include a fully reconciling funding mechanism (i.e., an EES). G.L. c. 25, § 21(b)(2)(vii); see also G.L. c. 25, § 21(d)(2). The Guidelines specify the manner in which revenue from the EES may be collected from ratepayers. Guidelines § 3.2.

181 Our Order today addresses the Compact's proposed allocation methods and factors for the 2022-2024 Three-Year Plan term, including issues related to the Compact's 2022 EES, which have been approved subject to reconciliation after further investigation in D.P.U. 21-119. The Department will address all issues related to the Compact's previous cost allocation proposals and EES in the applicable dockets (see D.P.U. 19-136 (Compact's 2020 EES); Cape Light Compact, D.P.U. 16-127 (2013-2015 Term Report); Cape Light Compact, D.P.U. 19-96 (2016-2018 Term Report)).

Department must finally resolve any continuing tension that exists between the Compact's view of its Governing Board's discretion operating pursuant to an approved municipal aggregation plan, and the Department's application of ratemaking principles and precedent to energy efficiency filings under its purview.[182] The Compact's assertion of complete discretion is not a "method," let alone an acceptable method under established ratemaking principles and precedent.[183] The Compact and its Governing Board, like a utility company and its directors, may recommend an allocation of costs; the Department determines whether the proposed costs allocation is appropriately recoverable in rates.[184] American Hoechest

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182 We note that previously the Compact has reiterated its erroneous belief that it has complied with the Department's directive that it identify its allocation methods and factors and that the "method it identified to allocate shared costs is that the Compact's [Governing] Board decides the allocation factors." D.P.U. 20-122, Initial Filing at Exh. 1, at 11-12 (October 30, 2020).

183 See e.g., 2016-2018 Three-Year Plans Order, at 125 (approving methods to allocate joint energy efficiency costs between NSTAR Electric and WMECo); D.P.U. 12-25, at 221-242 (discussing allocation of costs among affiliates); D.P.U. 08-27, at 78-91 (analyzing allocation of costs among affiliates under Department standards); Cambridge Electric Light Company, D.P.U. 92-250, at 89 (1993) (directing company to allocate costs based on actual time sheet totals and not historical estimates of time spent by employees on different operations); American Water Company, D.P.U. 88-172, at 31-33 (1989) (allowing rent allocation based on the number of customers served by each company).

184 The Compact cites Cape Light Compact, D.P.U. 16-177, at 10 n.10 (2016), for the premise that "the Department does not investigate the appropriateness of the Governing Board's authorization of funds for collection through the EES" (Exh. Compact-2, at 145). This is simply not true. As we have made clear above, the Department must, does, and will investigate the appropriateness of all funds collected through the EES and is not bound by any Governing Board "authorization of funds." Further, the cite in question in no way addresses the Department's authority to oversee the EES as alleged by the Compact. Instead, it addresses issues raised by

Corporation v. Department of Public Utilities, 379 Mass. 408, 413 (1980) ("[W]e repeat again the principle that when alternative methods are available, the [D]epartment is free to select or reject a particular method as long as its choice does not have a confiscatory effect or is not otherwise illegal"). Where the Compact seeks to recover funds through an EES subject to Department review, we must apply appropriate oversight on behalf of the Compact's ratepayers as we do on behalf of all others in the Commonwealth for other Program Administrators.

The Compact has endeavored to be more transparent in its decision making and responsive to the directives of the Department and for the 2022-2024 Three-Year Plan term it has identified fixed allocation factors to be set for most categories of shared costs. We must emphasize, however, that this is not a matter of the discretion of the Compact's Governing Board. As a Program Administrator, the Compact is subject to the Department's regulatory oversight applying our established ratemaking principles and precedent, which includes the appropriate allocation of shared costs. In no context is an exercise of discretion an acceptable, reviewable, or supportable allocation method.

The Department's precedent regarding costs shared between or among related entities often involves the same costs at issue in the Compact's filings: apportioning rent and insurance when operating out of a single facility, employees billing time to separate entities and tasks, and dividing shared overhead such as internet and computer costs. See

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a commenter related to the Governing Board's authority vis-à-vis the Compact's member municipalities.

D.P.U. 12-25, at 221-242; D.P.U. 08-27, at 78-91; Cambridge Electric Light Company, D.P.U. 92-250, at 89 (1993); Massachusetts American Water Company, D.P.U. 88-172, at 31-33 (1989). In this context our cases allocating costs among affiliated entities are instructive, specifically the directive that costs should be allocated to the utility by a method that is both cost effective in application and nondiscriminatory. See Aquarion Water Company of Massachusetts, D.P.U. 17-90, at 203-204 (2018) (customer service and information technology costs allocated on the basis of customer counts; shared office costs allocated by deriving a building overhead rate per facility then applying the rate to labor charged from each facility to the company); Oxford Water Company, D.P.U. 86-172, at 16-17 (1987) (allocation of lease costs for company vehicles based on actual use).

We note that the Department has applied these principles in the three-year plan context previously in approving the allocation of certain shared costs between NSTAR Electric and Western Massachusetts Electric Company ("WMECo.") 2016-2018 Three-Year Plans Order, at 125 n.59. In that instance, the Department applied the reasonableness standard and approved the allocation of shared costs based on several methods as appropriate to the underlying costs, including direct allocation based on benefits (e.g., costs incurred in a company's service territory would be charged directly to that company), planned energy efficiency budgets, and a weighting of program budgets and number of customers in each service territory. 2016-2018 Three-Year Plans Order, at 125 n.59.

Below, the Department will review the Compact's proposed allocation methods and resulting factors under the established rubric for the evaluation of the allocation of shared

costs among related entities, including the reasonableness of the proffered method and the representative accuracy of the data underlying the calculation (e.g., test year or other basis). See 2016-2018 Three-Year Plans Order, at 125 (applying reasonableness standard to allocation methods).

b. Shared Cost Allocation Method

The Compact proposes to allocate the majority of its shared costs for the 2022-2024 Three-Year Plan term based on the percentage of staff time spent on energy efficiency versus municipal aggregation activities in 2021. This proposed method results in an allocation of 95 percent of these shared costs to the energy efficiency budget and five percent to the municipal aggregation operational budget (Exh. Compact-2, at 147).

Above, the Department rejected the Compact's argument that its Governing Board decides the allocation factors. The Department must, therefore, review the reasonableness of the Compact's proposed allocation method and resulting factors. In particular, the Department will evaluate whether the proposed method of allocating costs using employee hours is appropriate for the identified cost categories and whether the use of 2021 employee hours provides an accurate basis to calculate the allocation factor.

In considering the reasonableness of a proposed allocation method, the Department must ensure that the resulting cost allocation does not result in an improper subsidization of the Compact's municipal aggregation program by its ratepayer-funded energy efficiency program. All else equal, we presume that the Compact would prefer to assign a greater percentage of its shared costs to energy efficiency where those costs are recovered dollar-for-

dollar through a fully funded reconciling mechanism (as opposed to its aggregation budget, which is essentially fixed).

The first step in determining whether an allocation method is reasonable is identifying the cost driver of the shared costs. Here, for those shared costs directly related to the number of employees and their hours worked (e.g., salary, payroll services) the Department finds that it is reasonable to allocate those shared costs based on employee time spent on energy efficiency versus municipal aggregation.

It is less clear, however, that employee time spent on energy efficiency versus municipal aggregation is the appropriate cost driver for the remaining categories of the Compact's shared costs (i.e., software licenses, internet, rent, custodial, other utilities, auditor, treasury services, financial software, and insurance).[185] The choice of allocation method can have a significant impact on the percentage of costs allocated to the Compact's energy efficiency budget. In the 2019-2021 Three-Year Plan term, for example, the Compact proposed to allocate 75 percent of its office space costs (including rent and utilities) to the energy efficiency budget based on the approximate use of the office space for each. D.P.U. 18-116, Exh. DPU-Compact 3-1 (December 4, 2018). The current proposal based on employee time would allocate 95 percent of rent and other office costs to the energy

185 The Compact acknowledged that there are certain costs it would incur and functions it would perform if it ceased to operate as an energy efficiency Program Administrator and continued only as a municipal aggregator (Tr. 4, at 563-572).

efficiency program (Exh. Compact-2, at 147).[186] Similarly, the Compact proposed to allocate 75 percent of shared insurance costs in the 2019-2021 Three-Year Plan term based on the decision of the Governing Board. D.P.U. 18-116, Exh. DPU-Compact 3-1. Again, the current proposal would allocate 95 percent of insurance costs to energy efficiency based on the 2021 employee hours breakdown (Exh. Compact-2, at 147).

Despite these concerns, the Department does not currently have a record on cost drivers for these shared costs sufficient to consider the reasonableness of an alternative allocation method. Over the next three years, the Program Administrators including the Compact must work hard to motivate customers to optimize their energy use in a manner that lowers costs and reduces GHG emissions. The Compact, in particular, must work to improve equitable access to its energy efficiency programs by reducing barriers to participation for customers that historically have yet to participate in these programs. For this reason, the Department exercises its judgment and finds that it is reasonable over the 2022-2024 Three-Year Plan term for the Compact to allocate its shared costs based on employee time spent on energy efficiency versus municipal aggregation.

Having determined that employee hours are a reasonable basis to apportion shared costs under these circumstances, the Department must now consider whether 2021 is an appropriately representative period upon which to set allocation factors for the

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[186] In its 2022 EES filing, the Compact stated that the allocation method for salary is a "[p]ercentage based on 2021 staff's actual time spent on energy efficiency or municipal aggregation," and the other listed categories use the same allocations as used for salary. D.P.U. 21-119, Exh. 3, at 3 (November 1, 2021).

2022-2024 Three-Year Plan term. Essentially the Compact has proposed 2021 as its test year for cost allocation purposes. The Compact did not, however, consider any other years in its analysis or the effect of measuring employee hours over a longer term (Tr. 4, at 555).

For the reasons discussed below, the Department finds it is not reasonable to base the Compact's allocation factors for the 2022-2024 Three-Year Plan term on employee hours from 2021 alone. As described elsewhere in this Order, the process of preparing a Three-Year Plan filing and seeing it through Department review is uniquely rigorous and, therefore, the Department expects the number of employee hours spent on energy efficiency to be higher in a three-year plan development year like 2021 (Tr. 4, at 548-550). Similarly, we expect the hours spent on municipal aggregation functions to be higher in years when the Compact must procure a new contract for its municipal aggregation electricity supply.[187] Accordingly, the Department finds that it is necessary, for allocation purposes, to measure the Compact's employee time spent on energy efficiency versus municipal aggregation over a longer period of years.

For the 2022-2024 Three Year Plan term the Department finds that it is appropriate to measure the Compact's employee time spent on energy efficiency versus municipal aggregation over a period of six years (i.e., 2016 through 2021) for cost allocation purposes.

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187 The Compact entered into its current electric supply contract in 2018 and, therefore, it was in place during 2021. The Compact states that its current municipal aggregation supply contract ends in 2023 (Tr. 4, at 564). D.P.U. 21-MA, 2020 Municipal Aggregation Annual Reports, Cape Light Compact JPE 2020 Municipal Aggregation Annual Report at 2 (April 30, 2021).

A period of six years will ensure that the data capture at least one municipal aggregation contract year and two three-year plan development years. In its required compliance filing in this proceeding, the Compact shall calculate a revised proposed shared cost allocation factor based on employee time spent on energy efficiency versus municipal aggregation from 2016 through 2021. The Compact shall fully describe its calculation and provide all necessary documents and exhibits to support its filing (e.g., spreadsheet showing calculation with all formulas intact, table showing full-time equivalent hours broken down by employee, and total for each year).

c. Shared Legal Consumer Advocacy Costs

The Compact proposes to allocate certain shared legal costs to its energy efficiency or municipal aggregation functions each year based on: (1) the subject matter of the legal service provided; or (2) the same fixed percentage breakdown tied to staff salaries as described above where the legal matter is employee-related (Exh. Compact-2, at 146). The Department finds that this proposal is reasonable; however, consistent with our directives above regarding the role of the Governing Board as advisory only on cost recovery matters, the Department will review the final allocation proposal at the time it is made in an applicable EES filing and the final recovery of costs in the applicable EES, Annual Report, and Term Report proceedings.

In addition, the Compact proposes to allocate certain shared legal/consumer advocacy costs each year based on its Governing Board's approvals of "consumer advocacy worksheets" detailing the nature of the consumer advocacy matters (Exh. Compact-2,

at 146). Again, we find that any proposal based on the Governing Board's approval alone cannot stand and the Department must review the reasonableness of the proposed allocations as well as the prudence of the expenditure of the actual costs.

In order for any shared consumer advocacy costs to be allocated to the energy efficiency budget and ultimately recovered through the EES, the Department has determined that the Program Administrator must demonstrate a clear and direct energy efficiency-related benefit to Massachusetts ratepayers and the Department as a threshold matter must be able to determine that the costs at issue are in fact incurred for energy efficiency purposes. See G.L. c. 25, § 21. Costs arising from the Compact's general advocacy activities and its intervention and participation in non-energy efficiency-related matters before the Department, for example, should not be allocated to its energy efficiency function. Any apportionment of costs arising from participation in Department matters that may interest the Compact as both a Program Administrator and a municipal aggregator should be carefully scrutinized to prevent energy efficiency customers from inadvertently subsidizing other functions. See, e.g., Massachusetts Electric Company and Nantucket Electric Company, D.P.U. 15-120, Petition for Leave to Intervene of the Cape Light Compact (March 30, 2016).[188]

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[188] In D.P.U. 16-127, Exh. DPU-Common 1-5, the Compact explained that in addition to administering the energy efficiency program, it serves as a "consumer advocate in various regulatory and legislative matters that may impact Cape and Vineyard ratepayers or the Compact's overall operations ('General Legal Services')." The Compact stated that legal costs not directly related to energy efficiency or power supply are "apportioned between Energy Efficiency and Power Supply for those matters that have a general impact on the Compact as a municipal aggregator." D.P.U. 16-127, Exh. DPU-Common 1-5 (December 2, 2016).

The 2019-2021 Three-Year Plans Order was clear that the Department anticipated that the Compact would classify the "large majority" of consumer advocacy/legal costs as non-energy efficiency-related to be recovered through its municipal aggregation budget. 2019-2021 Three-Year Plans Order, at 143. In its next EES filing with the Department, however, the Compact stated its 2019 and projected 2020 legal costs for D.P.U. 15-122 were allocated 70 percent to the energy efficiency budget and only 30 percent to the municipal aggregation operating budget. D.P.U. 19-136, Compact Brief at 12 (January 13, 2021).

In its 2022 EES filing, the Compact proposes an allocation of shared legal/consumer advocacy costs of 13 percent to the energy efficiency budget and 88 percent to the municipal aggregation budget. D.P.U. 21-119, Exh. 3, at 4 (November 1, 2021). This is better aligned with what the Department indicated was its expectation in the 2019-2021 Three-Year Plans Order. The Department approved the Compact's 2022 EES (including the proposed allocation of shared legal/consumer advocacy costs) subject to reconciliation after further investigation and the Department will make a final determination of reasonableness of this proposed allocation in phase two of its investigation.

Based on the above considerations, the Department finds that the Compact's proposal to establish an allocation factor for shared legal/consumer advocacy costs each year is reasonable; however, consistent with our directives above regarding the role of the Governing Board as advisory only for cost recovery matters, the Department will review the final allocation proposal at the time it is made in an applicable EES filing and the final recovery of costs in the applicable EES, Annual Report, and Term Report proceedings.

6. Conclusion

The Department intends to apply the allocation methods approved herein and, where applicable, resulting allocation factor for the 2022-2024 Three-Year Plan term. As we noted above, the Department is currently investigating the Compact's proposed allocations in several dockets and we expect our findings there will be helpful in establishing appropriate shared cost allocation methods for the Compact in future Three-Year Plan terms. To that end, in its next Three-Year Plan filing, the Compact shall present a detailed cost allocation proposal including a detailed study of the cost driver(s) for each category of shared costs.

The Compact must carefully track and maintain all cost allocation documentation. After review of the Compact's Annual Reports, the Department will determine whether an outside review of the Compact's allocation policy and process is required before the next three-year plan term. The Department takes this opportunity to remind the Compact that approval of an allocation factor and method is not the same as approval of final recovery of any allocated costs. Instead, in the appropriate Term Report or other proceeding, the Compact will be required to demonstrate that all such expenditures were reasonable and prudently incurred, including that they provided a direct energy efficiency-related benefit to customers in its member municipalities. Failure to make such showing will result in disallowance of the costs.

E. Equity and Participation Rates

Based on the Department's review of the Compact's proposed 2022-2024 Three-Year Plan, the 2013-2017 Residential Non-Participant Customer Profile Study, and certain

information provided in discovery, the Department has identified particular concerns regarding the historical participation record of customers in the Compact's service area.[189] The Program Administrators, including the Compact, have committed to "establishing more equal access to and participation in energy efficiency, particularly among those groups who have historically participated at lower rates, including renters/landlords, moderate-income customers, English-isolated families, and microbusinesses" (Statewide Plan, Exh. 1, at 17). The 2013-2017 Residential Non-Participant Customer Profile Study is one of the foundational analyses the Program Administrators use to determine whether a group of customers or a community has had historically lower participation rates (Statewide Plan, Exh. 1, at 18-21). The Program Administrators, with the support of the Council, have prioritized increasing investments and participation rates in historically underserved populations (Statewide Plan, Exh. 1, at 18, 21).

According to information provided by the Compact in discovery, 15 out of the 21 Compact member municipalities have a consumption-weighted location participation rate for electric combined that is at or below the statewide average (Exh. DPU-Comm 2-14, Att. A). Of those 15 towns, eleven have a participation rate for electric combined at or below 30 percent and seven are at or below 25 percent (Exh. DPU-Comm 2-14, Att. A). In

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189 As discussed in Section XI.C., above, National Grid (gas) and the Compact have overlapping service areas on Cape Cod and, therefore, National Grid (gas) also provides energy efficiency services to certain customers in towns within the Compact's member municipalities. The performance of National Grid (gas) in serving these Mutual Customers will be addressed through the performance incentive mechanism (see Section VII, above).

addition, 19 out of the 21 Compact member municipalities are below 30 percent for the participation rate for ranking purposes (Exh. DPU-Comm 2-14, Att. A).[190] Further, all of the Compact's member municipalities are at or below 40 percent for the participation rate for ranking purposes (Exh. DPU-Comm 2-14, Att. A). The Department finds these historically low energy efficiency participation rates in most of the Compact's service area are of significant concern. Based on these data alone, the Compact is failing to deliver energy efficiency services at a rate that is average or above average compared to the rest of the Commonwealth (Exh. DPU-Comm 2-14, Att. A).

At the same time, the Compact historically has offered higher customer incentives than other Program Administrators (Statewide Plan, Exh. 1, App. G.1 – Cape Light Compact). See, e.g., 2019-2021 Three-Year Energy Efficiency Plans, Statewide Plan, Exh. 1, App. K – Cape Light Compact; 2016-2018 Three-Year Energy Efficiency Plans, Statewide Plan, Exh. 1, App. L – Cape Light Compact. The Department must carefully consider the prudence of implementing a program that provides higher incentives to participating customers (thereby increasing the bill impact burden on Compact customers)

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190 The participation rate for ranking purposes is the gas and electric combined consumption-weighted location participation rate, if available; otherwise, it is the electric or gas consumption-weighted location participation rate (Exh. DPU-Comm 2-14, Att. A). For gas and electric combined, the statewide average is 32 percent (Exh. DPU-Comm 2-14).

while simultaneously delivering among the lowest participation rates for any electric Program Administrator in Massachusetts.[191]

Additionally, as revealed in its most recent Term Reports, the Compact did not meet the requirement of G.L. c. 25, § 19(c) to spend at least ten percent of its budget on low-income programs.[192] Rather, the Compact spent only nine percent of its budget on low-income programs in 2013-2015 and 8.2 percent of its budget on low-income programs in 2016-2018. Cape Light Compact, D.P.U. 16-127, 2013-2015 Energy Efficiency Term Report, Part One at 18 (2013-2015 Customer Sector Cost Allocation) (August 1, 2016); Cape Light Compact, D.P.U. 19-96, 2016-2018 Energy Efficiency Term Report, Part One at 30 (2016-2018 Customer Sector Cost Allocation) (August 1, 2019). Further, the Compact reports that it achieved 47 percent less benefits in its low-income programs during the 2016-2018 Three-Year Plan term. Cape Light Compact, D.P.U. 19-96, 2016-2018 Energy Efficiency Term Report, Part One at 24 (2016-2018 Planned v. Evaluated Benefits (%))

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191 The Compact recovers the costs of implementing its energy efficiency programs from all electric ratepayers in its member municipalities through a fully funded reconciling mechanism (i.e., EES). Although customers can opt out of the Compact's municipal aggregation program, customers cannot opt out of having the Compact as their energy efficiency provider and paying the Compact's EES, regardless of whether they participate in the Compact's energy efficiency programs. See D.T.E. 00-47-C at 23.

192 The Department will not receive the 2019-2021 Term Report until August 1, 2022, and, therefore, we cannot yet speak to the Compact's low-income spending across the 2019-2021 Three-Year Plan term. See Guidelines § 4.1. However, based on the Compact's 2019 Plan-Year Report, the Compact spent only 8.8 percent of its budget on low-income programs in 2019. 2019 Energy Efficiency Plan-Year Report, D.P.U. 20-50, Cape Light Compact, JPE, Section II, 2019 Evaluated Budget Table (May 29, 2020).

(August 1, 2019). The goal of the low-income programs is to deliver energy efficiency in an equitable manner to low-income and hard-to-reach customers. Based on the foregoing, the Department questions the Compact's ability to deliver equitable services to all of its customers and, therefore, we will carefully examine the Compact's low-income program spending in its 2019-2021 Term Report.

In addition, the Department expects the Compact will use the results of the 2013-2017 Residential Non-Participant Customer Profile Study to enhance the way it equitably serves the customers in its member municipalities and to make improvements to the delivery of energy efficiency to increase participation among historically lower-participating communities in its service area. The Compact shall continue to conduct the Residential Non-Participant Customer Profile Study, present the study results to its Governing Board, and track the Compact's progress in these areas compared to other Program Administrators.

The Compact's Governing Board is comprised of municipal officials and the Department knows the Governing Board and the Compact's staff are dedicated to their constituents — we do not question this dedication. However, as a joint powers entity and not an investor-owned utility, there is no strong cost-containment or performance incentive mechanism easily applicable to the Compact. As investor-owned utilities, all other Program Administrators are subject to performance incentives and penalties, and poor performance will be the responsibility of the utility's shareholders, not its customers. Conversely, shareholder incentives and penalties are not available to the Department for incenting the Compact to expend ratepayer funds in a prudent and cost-efficient manner or to correct the

Compact's historical poor performance (Exh. Compact-2, at 114). Therefore, the Department finds that additional scrutiny of the Compact's performance is needed.

The authority of a municipal aggregator to implement an energy efficiency investment plan relies on a certification by the Department, inter alia, that the plan meets or exceeds state energy efficiency goals. See Cape Light Compact, D.T.E. 00-47-C at 21 (2001); G.L. c. 164, § 134(b). In order to certify a municipal aggregator to implement energy efficiency programs, the Department must be convinced that the municipality (or group of municipalities) has the ability to deliver energy efficiency as required by law. Enforcing an accountability standard for municipal aggregators with certified energy efficiency plans is necessary to ensure that the entity is delivering energy efficiency in a safe, reliable, secure, affordable, and equitable manner. G.L. c. 25, § 1A.

If the Compact fails to improve on its record of underspending on low-income customers, historically low participation rates among all residential customers relative to the statewide average, and overall cost-effective and cost-efficient delivery of its programs, the Department will not be in the position to continue to certify the Compact's energy efficiency investment plan. Failing to achieve the low-income budget requirements and deliver energy efficiency in an equitable manner means that the energy efficiency plan will no longer be consistent with the state's energy efficiency goals.

Potential decertification of the Compact's energy efficiency investment plan is the strongest recourse available to the Department to address the Compact's performance concerns relative to its customers and the statewide goals. Accordingly, in the Compact's

Annual Report and Term Report dockets, the Department will consider whether it is appropriate to maintain certification of the Compact's energy efficiency plan based on performance and its ability to achieve its goals in a cost-effective and cost-efficient manner, including participation goals and equitable service goals.

XII. OTHER ISSUES

A. EGMA/NSTAR Gas Three-Year Plan Consolidation

1. Introduction

After the acquisition of Bay State Gas Company, the parent company of Columbia Gas of Massachusetts, by Eversource Energy, EGMA and NSTAR Gas each share the same corporate parent.[193] However, NSTAR Gas and EGMA remain separate operating companies with individual gas distribution service territories and rates.

NSTAR Gas and EGMA seek approval to implement a consolidated Three-Year Plan with two exceptions (Exhs. NSTAR Gas-2, at 137; EGMA-2, at 137).[194] Specifically, NSTAR Gas and EGMA request approval to implement: (1) common program design and implementation activities; (2) an aggregated program budget for the purposes of mid-term modification triggers; (3) an aggregated common savings goal; and (4) a single performance

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193 On October 7, 2020, the Department approved a settlement agreement authorizing the acquisition of Bay State Gas Company, the parent company of Columbia Gas of Massachusetts, by Eversource Energy, the parent company of EGMA. Joint Petition of Eversource Energy, NiSource Inc., Eversource Gas Company of Massachusetts, and Bay State Gas Company d/b/a Columbia Gas of Massachusetts for the sale of Bay State Gas Company to Eversource Energy, D.P.U. 20-59, at 69-71 (2020).

194 NSTAR Gas and EGMA filed data tables and all other exhibits both jointly and separately (Exhs. NSTAR Gas-4; EGMA-4; NSTAR Gas-EGMA-4).

incentive pool and earnings thresholds (Exhs. NSTAR Gas-2, at 137-145; EGMA-2, at 137-145; DPU-EGMA 1-1; DPU-NSTAR Gas 1-1). NSTAR Gas and EGMA propose to continue to perform cost-effectiveness screenings on an individual-company basis (Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1). Finally, NSTAR Gas and EGMA propose to continue to track spending on an individual-company basis for the purpose determining whether each company has allocated at least 20 percent of its budget for low-income gas energy efficiency programs pursuant to G.L. c. 25, §§ 19(b), (c), 21(b)(3) (Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1).

2. EGMA/NSTAR Gas Proposal

a. Program Design and Implementation

NSTAR Gas and EGMA propose to employ a common program design and jointly implement their energy efficiency programs to fulfill each company's statutory energy efficiency obligations (Exhs. NSTAR Gas-2, at 137, 139-141; EGMA-2, at 137, 139-141). NSTAR Gas and EGMA propose to offer the same core programs and employ the same delivery mechanisms across both service territories; however, NSTAR Gas and EGMA will each retain a separate lead vendor for income-eligible programs in order to leverage the vendor's existing relationships in each service territory (Exhs. NSTAR Gas-2, at 139-141; EGMA-2, at 139-141). NSTAR Gas and EGMA propose to continue to apply company-specific cost-effectiveness screenings to ensure programs and core initiatives are delivered to all customers in a cost-effective manner (Exhs. NSTAR Gas-2, at 144; EGMA-2, at 144; DPU-NSTAR Gas 1-1; DPU-EGMA 1-1).

b. Program Budget

EGMA and NSTAR Gas requests approval of an aggregated program budget (Exhs. NSTAR Gas-2, at 141; EGMA-2, at 141). NSTAR Gas and EGMA will maintain separate EES for each company (Exhs. NSTAR Gas-2, at 143; EGMA-2, at 143).

For the 2022-2024 Three-Year Plan term, NSTAR Gas and EGMA propose to track energy efficiency costs separately in each company's respective accounting system and allocate common resource costs based on planned net benefits (Exhs. NSTAR Gas-2, at 141; EGMA-2, at 141). EGMA and NSTAR Gas propose to allocate joint salary, legal, and regulatory costs based on planned energy efficiency budgets (Exhs. NSTAR Gas-2, at 142-143; EGMA-2, at 142-143). EGMA and NSTAR Gas propose to allocate other common PP&A costs based on an even weighting of planned energy efficiency budgets and number of customers in each service territory (Exhs. NSTAR Gas-2, at 143; EGMA-2, at 143). Costs that each company incurs in its individual service territory will be charged directly to that company (Exhs. NSTAR Gas-2, at 142; EGMA-2, at 142).

EGMA and NSTAR Gas propose to track spending separately for the purpose of assessing whether each company has allocated at least 20 percent of its budget for low-income gas energy efficiency programs pursuant to G.L. c. 25, §§ 19(b), (c), 21(b)(3) (Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1). Finally, EGMA and NSTAR Gas propose to employ an aggregated program budget for the purposes of assessing mid-term modification triggers (Exhs. NSTAR Gas-2, at 145; EGMA-2, at 145).

c. Savings Goal

NSTAR Gas and EGMA propose to adopt an aggregated savings goal (Exhs. NSTAR Gas-2, at 139; EGMA-2, at 139). NSTAR Gas and EGMA maintain that the aggregate goal will not change the total savings goal each company is responsible for meeting (Exhs. NSTAR Gas-2, at 139; EGMA-2, at 139).

d. Performance Incentive Mechanism

NSTAR Gas and EGMA propose to adopt a common performance incentive mechanism with respect to pool amounts and earnings thresholds (Exhs. NSTAR Gas-2, at 143-144; EGMA-2, at 143-144; DPU-NSTAR Gas 1-1; DPU-EGMA 1-1). NSTAR Gas and EGMA state that total available incentive dollars will not be affected by their adoption of a consolidated Three-Year Plan (Exhs. NSTAR Gas-2, at 144; EGMA-2, at 144). NSTAR Gas and EGMA propose to allocate performance incentive payments to each company based on the service territory where the benefits were achieved (Exhs. NSTAR Gas-2, at 144; EGMA-2, at 144).

3. Positions of EGMA/NSTAR Gas

EGMA and NSTAR Gas argue that their proposal to implement a consolidated Three-Year Plan will fulfill each company's statutory energy efficiency obligations while also providing the potential for regulatory efficacies and other savings (Program Administrators Brief at 81). Further, EGMA and NSTAR Gas maintain that Department approval of their proposal will result in no adverse impacts to customers of either company (Program Administrators Brief at 81).

EGMA and NSTAR Gas maintain that each company's energy efficiency budget is structurally identical and, therefore, maintaining separate budgets would impose unnecessary administrative and regulatory burdens on both companies (Program Administrators Brief at 85, citing Exhs. NSTAR Gas-2, at 141; EGMA-2, at 141). In addition, EGMA and NSTAR Gas assert that they expect to achieve short-term cost savings from a consolidated Three-Year Plan from two main areas: (1) planning, analysis, and regulatory reporting due to a potential reduced need for mid-term modifications; and (2) reduced implementation costs to the extent that the most cost-effective and available opportunities can be pursued within each service territory (Program Administrators Brief at 81, citing Exhs. DPU-EGMA 1-2; DPU-NSTAR Gas 1-2).

NSTAR Gas and EGMA argue that their proposal to calculate performance incentives based on combined performance is reasonable because incentive costs will be allocated to each company based on the service territory where the benefits accrue (Program Administrators Brief at 87). NSTAR Gas and EGMA further argue that having a single set of performance incentive thresholds will allow greater flexibility in pursuing cost-effective efficiency, specifically for strategic electrification (Program Administrators Brief at 82). NSTAR Gas and EGMA also argue that treatment as a combined plan will allow the companies to pursue the most cost-effective electrification opportunities regardless of geography (Program Administrators Brief at 83, citing Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1).

In support of their proposal, EGMA and NSTAR Gas cite what they characterize as the successful integration of the Three-Year Plans of NSTAR Electric and WMECo (Program Administrators Brief at 81, citing 2013-2015 Three-Year Plans Order, at 136-137). In particular, EGMA and NSTAR Gas maintain that the integration in NSTAR Electric and WMECo as part of the 2013-2015 Three-Year Plans significantly reduced time spent planning and reporting for each company and resulted in cost savings (Program Administrators Brief at 81, citing Exh. DPU-EGMA 1-2). Finally, EGMA and NSTAR Gas assert that a consolidated Three-Year Plan would allow for a consistent customer experience in each service territory (Program Administrators Brief at 81-82).

No other party addressed this issue on brief.

4. Analysis and Findings

a. Program Design and Implementation

NSTAR Gas and EGMA propose to adopt a common energy efficiency program design and to jointly implement their programs, asserting that such treatment has the potential to reduce implementation costs (Exhs. NSTAR Gas-2, at 137-138; EGMA-2, at 137-138; Program Administrators Brief at 81). In addition, NSTAR Gas and EGMA maintain that implementing common programs through an integrated Three-Year Plan would provide a consistent approach to customer engagement and a unified customer experience (Program Administrators Brief at 83-84, citing Exhs. NSTAR Gas-2, at 138; EGMA-2, at 138). No party objected to the joint implementation of common programs by NSTAR Gas and EGMA.

Common energy efficiency program design and joint program implementation has potential to achieve efficiencies. Consistent with the requirements of the Green Communities Act, the Department encourages efforts that maximize the acquisition of all available cost-effective energy efficiency resources while minimizing implementation costs. G.L. c. 25, § 19. The Department is persuaded that, in these circumstances, joint implementation of common programs may create opportunities for additional savings (Exhs. DPU-NSTAR 1-2; DPU-EGMA 1-2). Accordingly, the Department approves the request of NSTAR Gas and EGMA to adopt a common program design and to jointly implement their programs.

b. Program Budget

The Department has found that a joint system for energy efficiency budgeting has the potential to achieve efficiencies. D.P.U. 12-110/D.P.U. 12-111, at 137. Although NSTAR Gas and EGMA will adopt an aggregated program budget, each company will track spending separately for the Three-Year Plan term and allocate costs for common resources according to planned net benefits, planned energy efficiency budgets, and/or number of customers in each service territory consistent with the allocation methods approved by the Department in 2016-2018 Three-Year Plans Order, at 125 & n.59 (Exhs. NSTAR Gas-2, at 141-143; EGMA-2, at 141-143). As a result, the Department finds that NSTAR Gas and EGMA will

continue to be able to compare expenditures by company and year (Exhs. DPU-EGMA 1-3; DPU-NSTAR Gas 1-3; Program Administrators Brief at 85).[195]

The Department finds that NSTAR Gas's and EGMA's proposed method for allocating shared energy efficiency costs will provide the Department with sufficient transparency to properly review such costs. Additionally, the Department finds that, with an aggregated budget, NSTAR Gas and EGMA still plan to spend at least 20 percent of their individual energy efficiency budgets to the low-income sector as required by G.L. c. 25, §§ 19(b), 19(c), 21(b)(3) (Exhs. NSTAR Gas-2, at 142; EGMA-2, at 142). Accordingly, the Department approves the request of NSTAR Gas and EGMA to adopt an aggregated budget.

c. Savings Goals

Although NSTAR Gas and EGMA propose to adopt an aggregated savings goal, the companies plan to maintain separate total savings goals (Exhs. NSTAR Gas-2, at 139; EGMA-2, at 139).[196] In order to monitor individual performance, NSTAR Gas and EGMA shall file individual and combined energy efficiency Annual Reports and Term Reports for this Three-Year Plan term. See 2013-2015 Three-Year Plans Order, at 137-138.

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195 EGMA and NSTAR Gas will each maintain work orders and take other steps to appropriately track cost categories by core initiative (Program Administrators Brief at 85).

196 The EGMA lifetime savings goal is 23,976,009 MMBtus and the NSTAR Gas lifetime savings goal is 23,116,686 MMBtus (Exhs. NSTAR Gas-4 (Rev.); EGMA-4 (Rev.), at 26).

d. Cost Effectiveness

As discussed in Section VI.D., above, the individual energy efficiency programs of NSTAR Gas and EGMA are cost effective, as planned (Exhs. NSTAR Gas-2, at 142; EGMA-2, at 142). In addition, NSTAR Gas and EGMA have demonstrated that their programs are projected to be cost effective if pursued through an integrated Three-Year Plan (Exhs. DPU-NSTAR 1-2; DPU-EGMA 1-2).

In order to ensure that programs and core initiatives are delivered to all customers in a cost-effective manner, NSTAR Gas and EGMA shall screen for cost effectiveness separately (Exhs. DPU-EGMA 1-1; DPU-NSTAR Gas 1-1). NSTAR Gas and EGMA shall submit separate BCR models and data tables in all filings for the 2022-2024 Three-Year Plans term. The Department will review the performance of NSTAR Gas and EGMA to assess whether the energy efficiency programs, as implemented, were cost effective both on an individual basis and a combined basis.

e. Performance Incentive Mechanism

NSTAR Gas and EGMA propose to implement a joint performance incentive mechanism and collect performance incentives based on the combined performance of the two companies (Exhs. NSTAR Gas-2, at 143-144; EGMA-2, at 143-144). NSTAR Gas and EGMA further propose to allocate performance incentives to each company based on the service territory where the benefits accrue (Exhs. NSTAR Gas-2, at 144; EGMA-2, at 144).

The Department seeks to ensure that both NSTAR Gas and EGMA meet their performance commitments on an individual, company-specific basis for this Three-Year Plans

term for each component of the performance incentive mechanism. In addition, the Department is concerned that for the electrification component of the performance incentive mechanism, a joint performance incentive could result in underperformance in one service territory compared to the other (Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1).[197] Accordingly, the Department directs NSTAR Gas and EGMA to calculate and report performance incentives on an individual-company basis.[198] 2013-2015 Three-Year Plans Order, at 141.

f. Conclusion

With the exception of the proposed joint performance incentive mechanism, the Department approves the proposal of NSTAR Gas and EGMA to implement a consolidated Three-Year Plan (Exhs. NSTAR Gas-2, at 137; EGMA-2, at 137). NSTAR Gas and EGMA shall continue to perform internal planning, budgeting, and implementation activities in a way that maximizes the acquisition of all available cost-effective energy efficiency and minimizes costs. G.L. c. 25, § 19.

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197 Specifically, NSTAR Gas and EGMA state that they may have over-estimated how many buildings would be undergoing renovations in one (unspecified) service territory relative to the other (Exhs. DPU-NSTAR Gas 1-1; DPU-EGMA 1-1).

198 NSTAR Gas and EGMA may propose a joint performance incentive mechanism for the 2025-2027 Three-Year Plans term if they can demonstrate: (1) a joint mechanism will have no adverse effect on customers of either company; and (2) actual cost savings from the implementation of the joint 2022-2024 Three-Year Plans over the term.

Consistent with G.L. c. 25, §§ 19(b), 19(c), 21(b)(3), NSTAR Gas and EGMA shall spend at least 20 percent of their individual energy efficiency budgets on the low-income sector. In addition, NSTAR Gas and EGMA shall file all Annual Reports and Term Reports (and related documents) for this Three-Year Plans term, both on an individual and an aggregate basis. The Department will review the performance of NSTAR Gas and EGMA with respect to savings goals and cost effectiveness on an individual basis. Finally, as noted above, NSTAR Gas and EGMA shall calculate and report performance incentives on an individual company basis. NSTAR Gas and EGMA shall update the BCR screening models and data tables on an individual and aggregate level, as part of their compliance filings, in order to enable the Department to evaluate performance within each service territory.

B. Codes and Standards

1. Program Administrators Proposal

The Program Administrators propose to include savings in their Three-Year Plans associated with the Codes and Standards Compliance and Technical Support ("CSCS") initiative (Statewide Plan, Exh. 1, at 39). The proposed CSCS initiative provides technical support for the development of energy efficiency policies that subsequently drive energy savings (Statewide Plan, Exh. 1, at 37). Under the proposed CSCS initiative, the Program Administrators intend to pursue energy savings through two efforts: (1) codes and standards compliance support, which reduces energy savings lost due to noncompliance; and (2) codes and standards advancement support, which pursues the adoption of more stringent energy efficiency requirements (Statewide Plan, Exh. 1, at 38).

The Program Administrators introduced codes and standards compliance support as a measure in their 2019-2021 Three-Year Plans (Statewide Plan, Exh. 1, at 37). Although they had previously performed some of these activities, the Program Administrators propose to significantly increase their focus on codes and standards advancement support through lobbying efforts in the 2022-2024 Three-Year Plan term (Statewide Plan, Exh. 1, at 37-38).[199]

The Program Administrators propose to claim CSCS-related savings[200] starting in 2023 attributable to their support[201] for the appliance standards provisions of the Climate

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199 In their 2019-2021 Three-Year Plans, the Program Administrators indicated that they intended to expand their codes and standards efforts to "advance the adoption of progressively more efficient energy codes," including appliance standards. D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 45. More specifically, the Program Administrators indicated that they intended to provide technical assistance and research in order to: (1) support improvement of the efficiency of the statewide energy code during the Commonwealth's building code update process; and (2) support the adoption of product efficiency standards during the Commonwealth's then-forthcoming legislative session. D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 45. The Program Administrators anticipated claiming savings for these initiatives in 2021, based on efforts then underway. D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 45.

200 The Program Administrators have included CSCS-related savings in the following initiatives: (1) Residential New Homes & Renovations; (2) C&I New Buildings and Major Renovations; (3) Residential Retail Initiative; and (4) C&I New and Replacement Equipment (Statewide Plan, Exh. 1, at 38).

201 In response to discovery, the Program Administrators described their support for the appliance standards as: (1) testimony in support at public hearings; (2) submission of letters of support; (3) participation in stakeholder meetings; and (4) dedicated staff resources (Exh. DOER-Comm 1-1). The Program Administrators provided a log documenting these activities from 2017 through 2021, along with letters from state

Act, with a proposed attribution rate of ten percent (Statewide Plan, Exh. 1, at 39).[202] The Program Administrators arrived at the proposed ten percent attribution rate based on their collective judgment in the absence of a more appropriate way to determine an attribution factor (Exh. DOER-Comm 1-1). The Program Administrators propose to conduct an evaluation to better inform their savings claims in 2023 and 2024 (Statewide Plan, Exh. 1, at 39). The Program Administrators propose to conduct this study in 2022, to be completed in time to revise the proposed attribution factor to calculate actual savings in 2023 and 2024 (Statewide Plan, Exh. 1, at 39; Exh. DOER-Comm 1-1). Finally, the Program Administrators indicate that they did not conduct this study earlier because, at the direction of DOER, the proposed study was not approved by the Council (Exh. DOER-Comm 1-1).

2. Positions of the Parties

a. Program Administrators

The Program Administrators argue that their CSCS activities during the 2019-2021 Three-Year Plan term generated savings that will be realized in the upcoming term and, therefore, they should be permitted to the claim these and future savings from their efforts (Program Administrators Brief at 38-39). The Program Administrators maintain that the CSCS initiative supports the achievement of cost-effective energy efficiency because it

representatives, press articles referencing their involvement, and comments from other supporting organizations (Exh. DOER-Comm 1-1(a) through (e)).

202 The Program Administrators expect the savings from their efforts to be less than one percent of electric portfolio savings and approximately two percent of gas portfolio savings, after accounting for attribution (Statewide Plan, Exh. 1, at 39).

reaches historical non-participants and hard-to-reach customer segments (Program Administrators Brief at 38).

The Program Administrators argue that their support and public engagement made them the "headline sponsor" of the appliance standards in the Climate Act (Program Administrators Brief at 38-39). In this regard, the Program Administrators maintain their support was integral to passage of the appliance standards and, therefore, they should be permitted to claim savings from these efforts and future codes and standards advancement-support activities (Program Administrators Brief at 38-39; Program Administrators Reply Brief at 3-4).

The Program Administrators dispute DOER's assertion that they have provided insufficient evidence to demonstrate that their lobbying efforts lead to incremental savings (Program Administrators Reply Brief at 3). In response to DOER, the Program Administrators reiterate that their efforts were instrumental in the inclusion of appliance standards in the Climate Act, as evidenced by letters of support, testimony at public hearings, participation in stakeholder meetings, and other actions (Program Administrators Reply Brief at 3, citing Exh. DOER-Comm 1-1, Att. 1-1(b) through (e)).

The Program Administrators argue that they should be permitted to claim a ten percent savings attribution as a placeholder until they can conduct a study to develop an alternate attribution (Program Administrators Reply Brief at 4). The Program Administrators contend that a ten percent savings attribution is conservative and will ensure the effect of their efforts is quantified and captured, but not overstated (Program Administrators Reply

Brief at 4). The Program Administrators assert that DOER prevented them from conducting an earlier study to determine a more exact savings attribution (Program Administrators Reply Brief at 4, citing Exh. DOER-Comm 1-1).

Finally, the Program Administrators maintain that the scope of DOER's alternative proposal to allow them to claim savings from standards compliance is too narrow (Program Administrators Reply Brief at 4, citing DOER Brief at 37-38). In addition, the Program Administrators argue that this proposal is not part of the record and, therefore, the Department cannot not consider it (Program Administrator Reply Brief at 4).

b. Attorney General

The Attorney General argues that the Department should reject the Program Administrators' proposal to claim savings associated with their lobbying efforts related to the appliance standards legislation (Attorney General Reply Brief at 2). The Attorney General maintains that the Department allows Program Administrators to claim savings only where changes in customer consumption patterns can be directly attributed to Program Administrator action and/or activities (Attorney General Reply Brief at 2-3, citing D.P.U. 07-50-A at 29 (disallowing the recovery of lost base revenues associated with the energy efficiency activities)). Here, the Attorney General argues that the Program Administrators have presented insufficient evidence to show that the savings associated with the appliance standards are directly attributable to the Program Administrators' lobbying efforts (Attorney General Reply Brief at 3). In this regard, the Attorney General asserts that

the efforts of the Program Administrators were not the sole reason for the adoption of the appliance standards in the Climate Act (Attorney General Reply Brief at 2).

Finally, the Attorney General agrees with DOER's position that the Department should distinguish appliance standards compliance from appliance standards adoption (Attorney General Reply Brief at 2, citing DOER Brief at 39). The Attorney General maintains while appliance standards compliance activities may be appropriate activities to base a claim of savings, appliance standards adoption does not fall within the Program Administrators' energy efficiency mandate (Attorney General Reply Brief at 2, citing DOER Brief at 39).

c. Department of Energy Resources

DOER argues that the Department should reject the Program Administrators' attempt to claim "unsubstantiated" GHG savings associated with the CSCS initiative and, instead, require Program Administrators to achieve those savings through approved program initiatives (DOER Brief at 37). DOER contends that the Program Administrators' proposal to attribute ten percent of savings from appliance standards legislation lacks a reasonable evidentiary basis (e.g., estimates from other jurisdictions or evaluated savings data) (DOER Brief at 37-38, citing Exh. DOER-Comm 1-1). Moreover, DOER argues that the Department should direct the Program Administrators not to spend additional ratepayer funds to conduct an evaluation of their lobbying efforts (DOER Reply Brief at 13).

Additionally, DOER maintains the Program Administrators have failed to demonstrate the appliance standards legislation would not have been enacted without their support (DOER

Brief at 38, citing Exh. DOER-Comm 1-1, Att. 1-1(b) through (e)). Instead, DOER argues that the adoption of appliance standards is attributed to broad coalitions of supporters and not solely the result of the Program Administrators' intervention (DOER Brief at 37-38). Therefore, DOER argues that the Department should deny the Program Administrators' request to claim savings for their lobbying efforts (DOER Brief at 38; DOER Reply Brief at 12-13).

DOER further contends that lobbying efforts are not an appropriate use of ratepayer funds (DOER Reply Brief at 12). In this regard, DOER argues that lobbying expenses cannot be recovered through rates without evidence of direct benefits to ratepayers (DOER Reply Brief at 12, citing 2016-2018 Three-Year Plans Order, at 48-52, New England Telephone and Telegraph Company, D.P.U. 86-33-G at 101 (1989), Boston Edison Company, D.P.U. 1720, at 70-78 (1984)). DOER argues that the Program Administrators have not shown that their advocacy efforts have directly benefitted ratepayers (DOER Reply Brief at 12-13, citing Program Administrators Brief at 37-40).

Finally, in lieu of the Program Administrators' proposal to claim savings for the adoption of appliance standards, DOER proposes to establish a dedicated role for the Program Administrators in appliance standards compliance (DOER Brief at 39). DOER maintains that its proposal would use the Council's evaluation framework to more accurately attribute savings (DOER Brief at 39). DOER further asserts that appliance standards compliance is a valid source of potential cost-effective savings, is an appropriate activity for

the Program Administrators to undertake, and is an appropriate use of ratepayer-provided energy efficiency funds (DOER Brief at 39).

3. Analysis and Findings

As described above, the Program Administrators propose to continue the codes and standards compliance support and advancement efforts begun in the 2019-2021 Three-Year Plans term (Statewide Plan, Exh. 1, at 39). D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 45. In particular, the Program Administrators propose to continue their dedicated efforts to provide support for codes and standards compliance through the CSCS initiative as a way to reduce energy savings lost due to noncompliance (Statewide Plan, Exh. 1, at 38-39). No party objected to this aspect of the Program Administrators' proposal and the Department approves the continuation of the Program Administrators' codes and standards compliance activities in the Three-Year Plans.

Through the CSCS initiative, the Program Administrators also propose to increase their lobbying efforts to support the advancement of more stringent energy efficiency codes and standards (Statewide Plan, Exh. 1, at 39). The Program Administrators indicated in their 2019-2021 Three-Year Plans that they intended to undertake a multi-year effort to enact more stringent state appliance standards. D.P.U. 18-110 through D.P.U. 18-119, Statewide Plan, Exh. 1, at 45. Now that they have undertaken these efforts and the appliance standards are in place, the Program Administrators have submitted a proposal addressing how they intend

to claim savings associated with these (and future) lobbying efforts (Statewide Plan, Exh. 1, at 39).[203]

The Attorney General and DOER object to the codes and standards advancement aspect of the Program Administrators' CSCS proposal, arguing that lobbying efforts do not fall within scope of the Program Administrators' energy efficiency mandate (Attorney General Reply Brief at 2; DOER Brief at 39). DOER further argues that the Program Administrators' proposal to attribute ten percent savings from appliance standards legislation lacks evidentiary support (DOER Brief at 37-38).

The Department is generally supportive of the Program Administrators' efforts to enact more stringent energy efficiency codes and standards. The Department agrees with DOER, however, that the Program Administrators' proposal to adopt a ten percent attribution rate for savings associated with their appliance standards lobbying activities is without sufficient evidentiary support (Statewide Plan, Exh. 1, at 39). Here, however, the Program Administrators maintain that the Council's EM&V consultant, at the direction of a councilor, would not authorize the study they submit is necessary to fully support claimable savings for these activities (Program Administrators Reply Brief at 4, citing Exh. DOER-Comm 1-1).

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[203] The Program Administrators' CSCS initiative proposal was not clearly described and insufficiently developed in the Three-Year Plans filings (see Statewide Plan, Exh. 1, at 37-39). DOER was required to elicit significant details about the Program Administrators' proposal through discovery (Exh. DOER-Comm 1-1). In fact, the Department was unable to describe the Program Administrators' proposal above without numerous references to Exhibit DOER-Comm 1-1.

The Program Administrators must be able to conduct all studies necessary to support their achievement of all cost-effective energy efficiency.[204] Before the Department is able to evaluate whether there is any attribution that can be claimed for savings related to the Program Administrators' lobbying activities, the Department must review a properly conducted study. Accordingly, the Department directs the Program Administrators to complete the standards attribution evaluation study originally proposed to the Council's EM&V consultant (Exh. DOER-Comm 1-1, at 2). The Program Administrators shall submit such study with their 2022 Annual Reports. Pending the Department's review of the study, the Program Administrators may include a ten percent attribution rate as a placeholder for planned savings in their BCR data tables.

In addition, as the Attorney General and DOER correctly note, the Program Administrators must be able to show that any savings associated with the appliance standards (or other codes and standards advancement activities) are directly attributable to the Program Administrators' lobbying efforts. The Department finds that the Program Administrators

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204 The Department is concerned about the alleged actions under the EM&V process, as well as the Program Administrators' decision not to appeal a decision that affected their ability to present necessary information to the Department. For multiple Three-Year Plans, the Department has approved an EM&V framework that is designed to ensure the independence and objectivity of EM&V activities. See 2019-2021 Three-Year Plans Order, at 36. Under this EM&V framework, the Council's oversight is accomplished through the EM&V consultant (Statewide Plan, Exh. 1, App. H at 7-8). The Program Administrators and the EM&V consultants are supposed to work diligently to reach a consensus on evaluation issues and, if a consensus is not reached, the EM&V consultant (operating independently) or the full Council may make a final decision, subject to an appeals process (Statewide Plan, Exh. 1, App. H at 8).

cannot count these claimed savings towards their performance incentive goals without a showing in the Term Report that, but for their actions, the legislation would not have been passed.[205] 2016-2018 Three-Year Plans Order, at 51-52. Finally, consistent with longstanding Department precedent, if the Program Administrators seek to recover lobbying expenses through the EES, they must clearly demonstrate a direct benefit to Massachusetts ratepayers, which is a high burden to meet.[206] 2016-2018 Three-Year Plans Order, at 52.

C. Interim Continuation

Pursuant to the Green Communities Act, Program Administrators are required to file their three-year energy efficiency plans by October 31st of the year prior to the first year of the three-year plan. G.L. c. 25, § 21(d)(1). The Department must issue an Order on the three-year plans within 90 days of filing. G.L. c. 25, § 21(d)(2). The timing of the Program Administrators' filings and the Department's review results in the previously approved energy efficiency programs ending approximately 30 days prior to the Department's approval of the new three-year plans.

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205 The Program Administrators provided certain evidence in discovery regarding their role in supporting appliance standards (Program Administrators Reply Brief at 3, citing Exh. DOER-Comm 1-1, Att. 1-1(b) - (e)). Although we will not make any finding on the sufficiency of this evidence now, we strongly encourage the Program Administrators to submit additional evidence in light of the required findings outlined above.

206 In addition, the Program Administrators must provide evidence that: (1) details the structure and function of their lobbying efforts; (2) identifies the percentage of resources devoted to lobbying and legislative activities; and (3) provides the method used to derive the percentage. 2016-2018 Three-Year Plans Order, at 51-52; D.P.U. 86-33-G at 101; D.P.U. 1720, at 71, 74-75.

In recognition of the need for continuity of energy efficiency programs, upon motion of the Program Administrators, the Department has allowed for interim continuation of existing energy efficiency programs, pending approval of proposed new programs under review. See, e.g., 2019-2021 Three-Year Plans Order, at 178, citing 2013-2015 Three-Year Plans, Order on Motions for Interim Continuation (2012); 2010-2012 Three-Year Plans, Order on Motions for Interim Continuation (2009). In order to ensure the continuity of energy efficiency programs in the future and to obviate the need for motions for interim continuation, each Program Administrator may continue all energy efficiency and RCS programs approved in this Order, until the Department concludes its investigation of the 2025-2027 Three-Year Plans, unless otherwise ordered by the Department. See 2019-2021 Three-Year Plans Order, at 178. The Program Administrators shall continue their existing energy efficiency and RCS programs at Department-approved expenditure levels for program-year 2024 during the Department's review of the 2025-2027 Three-Year Plans. All funds expended during the interim continuation of energy efficiency and RCS programs will be charged against the Program Administrators' 2025 budgets.

XIII. CONCLUSION

Each Program Administrator's Three-Year Plan must provide for the acquisition of all available energy-efficiency and demand-reduction resources that are cost effective or less expensive than supply. See G.L. c. 25, §§ 19(a), 19(b), 21(b)(1); see also Guidelines § 3.4.7. The Department has reviewed the savings goals contained in the Three-Year Plans and finds that, subject to the directives and program modifications described above, they are

reasonable and are consistent with the achievement of all available cost-effective energy-efficiency and demand-reduction resources. The Department has reviewed the Three-Year Plans and finds that they are constructed in a manner that, in aggregate, meets the GHG emissions reduction goals set pursuant to G.L. c. 21N, § 3B. The Department directs the electric and gas Program Administrators to implement their respective Three-Year Plans in a manner that meets the specific electric and gas GHG emissions reduction goals set by the EEA Secretary.

Consistent with the requirements of G.L. c. 25, §§ 19(a), 19(c), 21(b)(2), the Department finds that each Program Administrator's Three-Year Plan, subject to the directives and modifications set forth above: (1) is designed to minimize administrative costs to the fullest extent practicable; (2) uses competitive procurement to the fullest extent practicable; and (3) includes a budget for low-income programs that meets the statutory minimums of ten percent for electric Program Administrators and 20 percent for gas Program Administrators.

The Green Communities Act requires the Department to ensure that the energy efficiency sectors included in the Three-Year Plans are cost effective. G.L. c. 25, § 21(b)(3). In assessing cost effectiveness, the Program Administrators must include a social value of GHG emissions reductions for all measures except fossil fuel heating and cooling conversions. The Department finds that the Program Administrators shall use the social value of GHG emissions reductions set forth in the AESC Study for the 2022-2024 Three-Year Plans (Statewide Plan, Exh. 1, App. Q). The Department finds that

each Program Administrator: (1) has appropriately evaluated the cost effectiveness of its energy efficiency programs; and (2) has demonstrated that, based on the projected benefits and costs, all energy efficiency sectors and programs are cost effective for each plan year and over the entire 2022-2024 Three-Year Plans term.

Pursuant to the Green Communities Act, the Three-Year Plans include a mechanism designed to provide an incentive to eligible Program Administrators based on their success in meeting or exceeding certain performance goals. G.L. c. 25, § 21(b)(2)(v). Subject to certain modifications and disallowances addressed herein, the Department approves: (1) the statewide incentive pool; and (2) the structure of the performance incentive mechanism for the savings, value, equity, and electrification components. The Program Administrators must file the calculation of the performance incentive mechanisms' payout rates in their compliance filing.

With respect to energy efficiency program funding, the Department has considered (1) the availability of other private or public funds, (2) whether past programs have lowered the cost of electricity to consumers, and (3) the effect of rate increases on consumers, and finds that each Program Administrator may recover the funds to implement its Three-Year Plan through the EES. G.L. c. 25, §§ 19(a), 21(b)(2)(vii). In particular, the Department finds that the proposed budgets are appropriately designed to achieve savings goals while minimizing customer rate impacts.

Subject to the modifications and disallowances addressed herein, the Department concludes that each Program Administrator's Three-Year Plan is consistent with the Green

Communities Act, the Guidelines, and Department precedent. Accordingly, subject to the modifications, disallowances, and directives contained herein, the Department approves each Program Administrator's Three-Year Plan and budget. Within 60 days of the date of this Order, or the date designated above, each Program Administrator shall file a compliance filing consistent with the directives set forth herein and further containing: (1) updated exhibits as appropriate, including without limitation updated statewide and Program Administrator-specific data tables, BCR models, bill impacts, data tables embedded in the Statewide Plan, and performance incentives models and related data; (2) Key Performance Indicators for the 2022-2024 Three-Year Plans term; (3) a matrix identifying each directive set forth in the Order and indicating where and how the directive is addressed in the compliance filing; and (4) an addendum to the Statewide Plan explaining at a high level the elements of the Statewide Plan that were revised per the Order, which addendum should also be submitted to the Council.

The energy efficiency programs will provide significant benefits and GHG emissions reductions that will align with the Commonwealth's energy policies. The Three-Year Plans approved today incorporate innovative approaches designed to strategically electrify building thermal loads while emphasizing a continued commitment to lowering overall energy usage. Further, the performance incentive structure appropriately motivates the Program Administrators to purse all cost-effective energy efficiency while addressing historically underserved populations. The energy efficiency programs in these Three-Year Plans will create a solid foundation for future energy efficiency activities as the Program Administrators

continue their sustained efforts to achieve all cost-effective energy efficiency and lower GHG emissions.

XIV. ORDER

Accordingly, after due notice, hearing, and consideration, it is:

ORDERED: That the three-year energy efficiency plans for 2022 through 2024 filed by The Berkshire Gas Company ("Berkshire Gas"), Eversource Gas Company of Massachusetts, d/b/a Eversource Energy ("EGMA"), Fitchburg Gas and Electric Light Company, d/b/a Unitil (Gas Division) ("Unitil (gas)"), Liberty Utilities (New England Natural Gas Company) Corp., d/b/a Liberty ("Liberty"), Boston Gas Company, d/b/a National Grid ("National Grid (gas)"), NSTAR Gas Company, d/b/a Eversource Energy ("NSTAR Gas"), the Towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Eastham, Edgartown, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, Wellfleet, West Tisbury, and Yarmouth, and Dukes County, acting together as the Cape Light Compact JPE ("Compact"), Fitchburg Gas and Electric Light Company, d/b/a Unitil (Electric Division) ("Unitil (electric)"), Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid ("National Grid (electric)"), and NSTAR Electric Company, d/b/a Eversource Energy ("NSTAR Electric") are APPROVED subject to the modifications, disallowances, and conditions contained herein; and it is

FURTHER ORDERED: That The Berkshire Gas Company ("Berkshire Gas"), Eversource Gas Company of Massachusetts, d/b/a Eversource Energy ("EGMA"), Fitchburg

Gas and Electric Light Company, d/b/a Unitil (Gas Division) ("Unitil (gas)"), Liberty Utilities (New England Natural Gas Company) Corp., d/b/a Liberty ("Liberty"), Boston Gas Company, d/b/a National Grid ("National Grid (gas)"), NSTAR Gas Company, d/b/a Eversource Energy ("NSTAR Gas"), the Towns of Aquinnah, Barnstable, Bourne, Brewster, Chatham, Chilmark, Dennis, Eastham, Edgartown, Falmouth, Harwich, Mashpee, Oak Bluffs, Orleans, Provincetown, Sandwich, Tisbury, Truro, Wellfleet, West Tisbury, and Yarmouth, and Dukes County, acting together as the Cape Light Compact JPE ("Compact"), Fitchburg Gas and Electric Light Company, d/b/a Unitil (Electric Division) ("Unitil (electric)"), Massachusetts Electric Company and Nantucket Electric Company, each d/b/a National Grid ("National Grid (electric)"), and NSTAR Electric Company, d/b/a Eversource Energy ("NSTAR Electric") shall comply with all other directives contained in this Order.

By Order of the Department,

/s/
Matthew H. Nelson, Chair

/s/
Robert E. Hayden, Commissioner

/s/
Cecile M. Fraser, Commissioner

An appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. G.L. c. 25, § 5.

[Evidence]

Request IR-18:

Page 38 of 65 of the Application:

(a) Please explain how E1 plans to move directionally towards an Energy Savings as a % of NS Power's Electricity Generation that is more aligned with its peers noted in the 2020 State and Energy Efficiency Scorecard.

(b) How does E1's 2023-25 DSM Settlement Plan Energy Savings as a % of NS Power's Electricity Generation compare with other Canadian Electric Utilities' utility-sector energy efficiency programs?

Response IR-18:

(a) EfficiencyOne's (E1) 2023-2025 Settlement Plan moves directionally towards energy savings as a percentage of NS Power's load that is more aligned with peers in the 2020 State and Energy Efficiency Scorecard. Net savings as a percentage of 2018 retail sales for the comparable jurisdictions of Massachusetts, Vermont, and Maine were 2.25%, 2.12%, and 1.03%, respectively. Please refer to E1's response to NSUARB IR-17 for detail on those specific comparators. Current electricity savings as a percent of load in Nova Scotia are approximately 1%. The 2023-2025 Settlement Plan is a modest step forward with energy savings at 1.1% of load in 2023, 1.3% of load in 2024, and 1.4% of load in 2025 with an average over the three years of energy savings at 1.2% of load. The Settlement Plan leverages E1's existing programs, introduces enhancements such as electrician installed measures in Efficient Product Installation and a new pay-for-performance service in Custom, as well as new initiatives such as the Affordable Single-family Homes and

Residential Behaviour program components, with the intent of achieving this directional increase in energy savings. Please refer to the table below.

First Year Energy Savings as % of NS Power's Load			
(GWh)	2023	2024	2025
Energy Savings	120.7	142.6	149.5
NS Power 2021 Load Forecast	11,043.0	11,119.0	11,083.0
Percentage	1.09%	1.28%	1.35%

(b) E1's 2023-2025 Settlement Plan achieves average energy savings for the 2023-2025 DSM Plan that are 1.2% of NS Power's load. Efficiency Canada's 2021 Canadian Energy Efficiency Scorecard[1], assesses policy and realized outcomes for the 18-month period between January 2020 and June 2021 and provides energy efficiency information on Canadian provinces. The 2021 Scorecard shows Nova Scotia as having the highest net incremental electricity savings as a percentage of domestic sales in 2020, compared to the other Canadian jurisdictions examined, and was scored 3.5 points out of a possible 8. The Scorecard reports that no Canadian jurisdictions achieved net incremental electricity savings of at least 1% of domestic sales in 2020 while noting that leading US states have met or exceeded 2.5%, which have historically been the jurisdictions that E1 has looked to for leading trends.

[1] https://www.scorecard.efficiencycanada.org/wp-content/uploads/2021/11/2021-Energy-Efficiency-Policy-Scorecard-English-Final.pdf

Request IR-19:

Page 39 of 65 of the Application:

(a) Please explain how E1 plans to move directionally towards an Electric Efficiency Spending as a % of NS Power's Annual Revenue that is more aligned with its peers noted in the 2020 State and Energy Efficiency Scorecard.

(b) How does E1's 2023-25 DSM Settlement Plan Electric Efficiency Spending as a % of NS Power's Annual Revenue compare with other Canadian Electric Utilities' utility-sector energy efficiency programs?

Response IR-19:

(a) EfficiencyOne's (E1) 2023-2025 DSM Settlement Plan moves directionally towards spending as a percentage of NS Power's annual revenue that is more aligned with peers in the 2020 State and Energy Efficiency Scorecard. Current spending on DSM has been 1.8% and 2.3% of NS Power's revenues for 2020 and 2021, respectively. The Settlement Plan represents DSM spending of 3.5% of NS Power's revenue in 2023 (assuming $1.5 billion) and increases slightly year over year. Please see table, below.

Investment as a % of NS Power's Revenue			
($ Million)	2023	2024	2025
E1 Investment	53.1	57.5	62.5
NS Power 2021 Revenue	1,500.0	1,500.0	1,500.0
Percentage	3.5%	3.8%	4.2%

(b) E1 does not have this data on other Canadian Electric Utilities spending on electric utility-sector energy efficiency programs as a percentage of annual utility revenues.

[Evidence]

Request IR-20:

On p. 41 of 65, E1 stated that the Settlement Plan "proposes an increase in DSM investment that is critical to counteracting lower investment levels of previous years".

(a) Please provide a table showing the Board approved DSM spending levels and E1's actual spending levels for each year since 2012.

(b) Recognizing that previous DSM approved spending levels were the result of public proceedings or legislated restrictions, please explain why E1 considers that it is critical to counteract those approved levels which were determined to be in the best interest of ratepayers at those times.

Response IR-20:

(a) Please refer to Table 1, below, for the Nova Scotia Utility and Review Board (NSUARB) approved DSM spending levels as compared to EfficiencyOne's (E1) actual.

Table 1: NSUARB-approved Investments Levels compared to Actual Spending in millions of dollars

DSM Investment ($ million)											
Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Approved	43.7	46.2	48.7	39.0	33.2	34.0	34.9	34.1	34.4	34.6	41.0
Actual / Forecast	44.1	39.7	37.1	32.0	30.8	30.3	34.0	34.1	28.4	36.0	45.6
Variance	0.4	(6.5)	(11.6)	(7.0)	(2.4)	(3.7)	(0.9)	0.1	(6.0)	1.4	4.6

(b) E1 acknowledges that in the context of a regulatory process for approval of a DSM Plan, the regulator is required to consider a number of factors beyond the specifics of an Integrated Resource Plan (IRP); including existing legislation. As one example, E1 recognizes that the Nova Scotia Utility and Review Board (NSUARB) is required to consider affordability as a factor in determining the appropriate level of investment for DSM during any plan approval and that affordability balances both short term and long-term considerations. Recognizing that the IRP does reflect the long-term best interests of ratepayers, E1 believes that, when possible, DSM investment should directionally follow the IRP, including the capture of previous underinvestment wherever possible.

E1 does consider that an opportunity remains for ratepayers to realize the benefits from the unrealized energy savings with an investment in future periods. This is particularly relevant during the 2023-2025 planning period as Nova Scotians face the challenge of climate change and the need for greater levels of DSM.

Request IR-21:

Referencing Figure 5 on page 41 and Figure 11 on page 50,

(a) Please provide a table which shows the Board approved GWh and investment level for 2020 to 2022, E1's preferred plan GWh and investment level for 2023 to 2025, E1's alternate plan GWh and investment level for 2023 to 2025, as well as the 2014 and 2020 IRP reference plan GWh and investment levels from 2020 to 2028.

(b) Please also provide a chart which graphically displays all of this data.

Response IR-21:

EfficiencyOne (E1) developed both the Preferred Plan and Alternate Scenario through an extensive stakeholder process. As a result of this effort, in February 2022, E1 and stakeholders were able to gain alignment on one Plan, now referred to as the Settlement Plan, that replaced E1's Preferred Plan. For that reason, the Preferred Plan in this IR response has been replaced with the Settlement Plan.

(a) Please refer to Table 1, below, for the first-year energy savings in GWh and Table 2, below, for the investment in millions of dollars.

Table 1: First Year Energy Savings in GWh

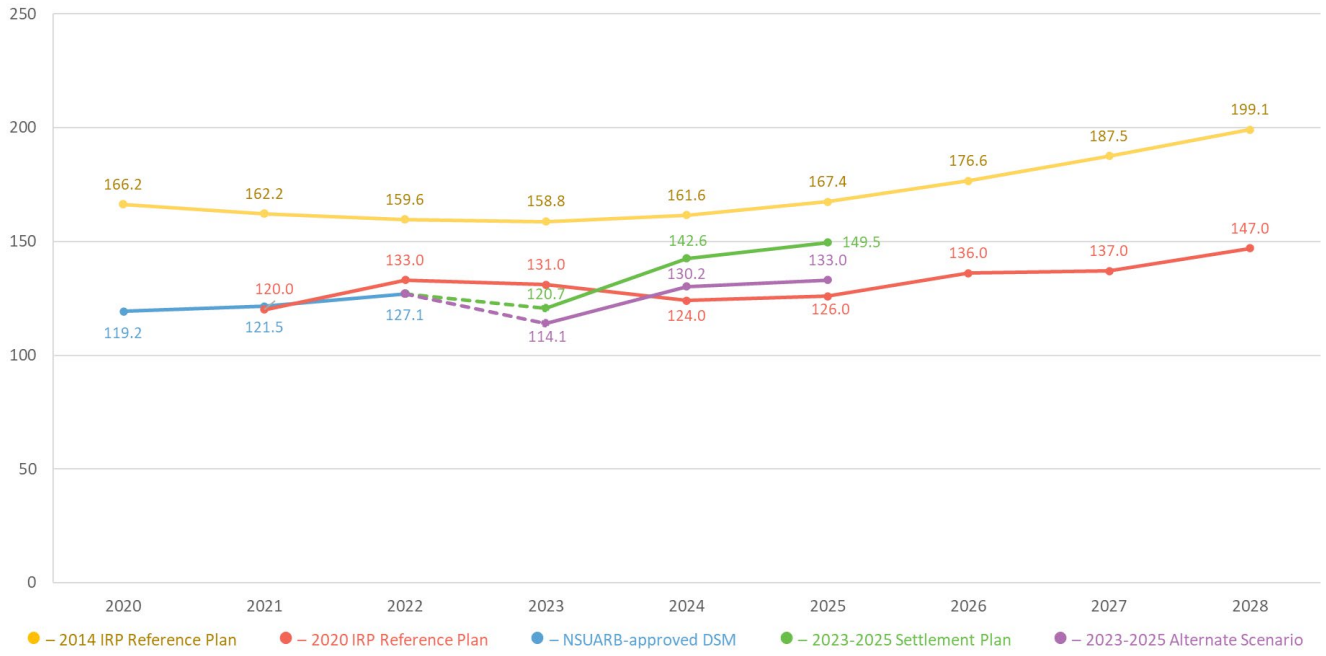
First Year Energy Savings (GWh)									
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028
Approved	119.2	121.5	127.1						
Settlement Plan as Filed				120.7	142.6	149.5			
Alternate Plan as Filed				114.1	130.2	133.0			
2020 IRP		120.0	133.0	131.0	124.0	126.0	136.0	137.0	147.0
2014 IRP	166.2	162.2	159.6	158.8	161.6	167.4	176.6	187.5	199.1

Table 2: Investment in Millions of Dollars

Investment ($ million)									
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028
Approved	34.4	34.6	41.0						
Settlement Plan as Filed				53.1	57.5	62.5			
Alternate Plan as Filed				51.1	53.2	55.9			
2020 IRP		47.9	55.6	60.3	65.1	62.3	72.1	70.8	70.1
2014 IRP	86.7	81.7	79.1	76.3	76.8	78.5	81.9	85.7	90.1

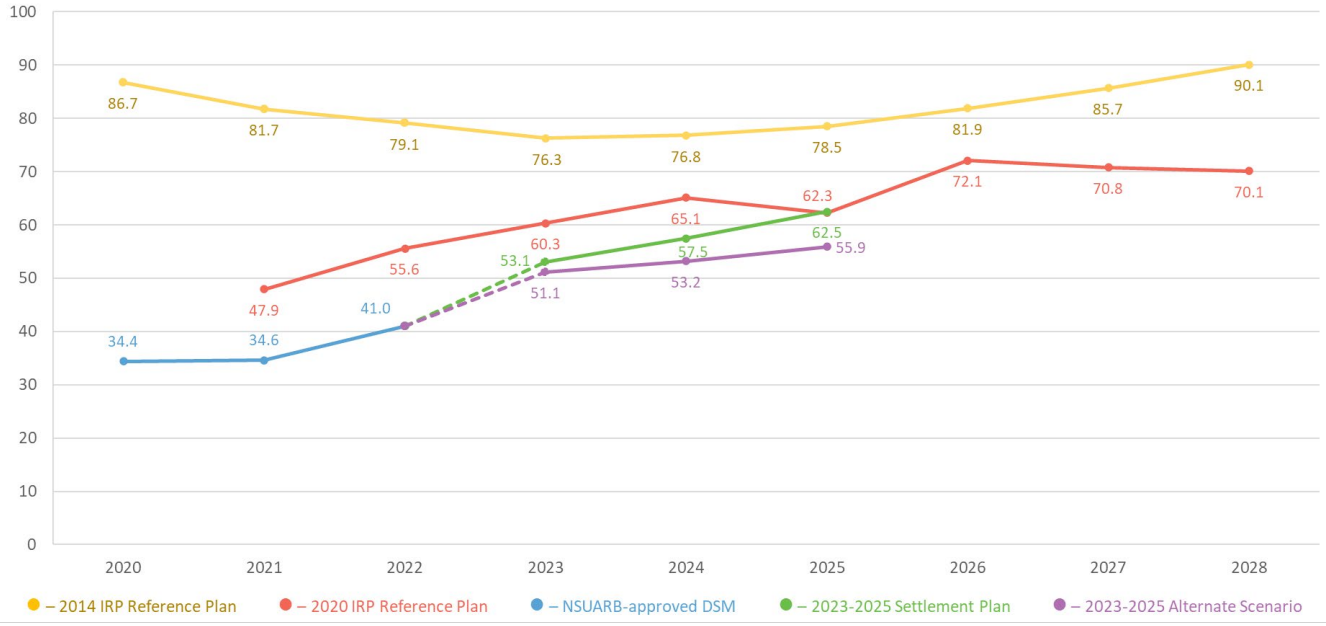
(b) Please refer to Figure 1, below, for the first-year energy savings in GWh and Figure 2, below, for the investment in millions of dollars, both of which graphically displays the data.

1 Figure 1: First-Year Energy Savings in GWh



2

3 Figure 2: Investment in Millions of Dollars



[Evidence]

Request IR-22:

On p. 42 of 65, Figure 6 notes proposed 2023 spending of $1.1 million for "Re-introduction of Behaviour". Tables 11 and 12 in Appendix A show a further spending of $2.2 million in each of years 2024 and 2025.

(a) Given that this is labelled as a "re-introduction", please explain how this proposed program aligns or differs from the any previous "behaviour" program.

(b) How will success be measured?

Response IR-22:

(a) Behaviour change programs are an essential component of demand side management portfolios to realize energy savings. Effective behaviour change programs achieve energy savings through changes in individual or organizational behaviour. Typically, behaviour energy efficiency programs are one of the most cost-effective ways for DSM administrators to achieve energy savings. Through the provision of insights, tips, and consumption information, participants are given the tools and motivation to make informed choices about their energy usage. Customers also benefit from these programs by recognizing bill savings immediately without incurring any incremental costs. This program complements other marketing strategies and outreach activities and allows EfficiencyOne (E1) to reach more Nova Scotians. Customers are introduced to other E1 efficiency programs resulting in even more bill savings.

E1, as the DSM administrator in Nova Scotia, has included a residential behaviour program component in the 2023-2025 DSM Plan. E1 understands through NS Power's Customer Energy Management (CEM) matter that the CEM system is not considered to be a DSM program but rather an engagement tool that can direct customers to E1's energy efficiency programs. Previously, E1 delivered the Home Energy Report, a behaviour energy efficiency program component, to Nova Scotia residents as part of its DSM portfolio. The reports provided residents with insights into their home's electricity use, including how their usage changed over time and how it compared to similar homes in their area. They also included practical energy saving tips and other tools and resources to help residents manage their electricity use. Re-introducing a behaviour change offer is important for E1 to reach more customers, round out its DSM portfolio, and deliver cost-effective savings in the future.

As part of the 2023-2025 DSM Plan, the design and delivery of the Residential Behaviour program will build upon the success of E1's former Home Energy Report program, which resulted in residents implementing more than 82,000 energy saving tips, without incurring any incremental costs. The 2023-2025 DSM Plan behavioural offer will be strengthened by E1's access to Advanced Metering Infrastructure (AMI) data and other advances in energy analytics, which will allow E1 to offer more personalized, actionable energy savings tips and recommendations, and increase participation in other residential programs.

(b) In the 2023-2025 DSM Plan, the energy savings assumptions for Residential Behaviour relied on an energy savings assumption of 2 percent savings per home, relative to a typical Nova Scotia home consumption. The percentage savings assumption was informed by Guidehouse, and an analysis of average consumption by home was performed by Guidehouse using 2021 NS data (10,362 kWh per home). These assumptions informed an annual energy savings estimate of 207 kWh per year per home.

Consistent with all DSM program components, the Residential Behaviour program component included in E1's 2023-2025 DSM Plan will be subject to annual independent third-party evaluation. Similar to the previously delivered Home Energy Report, it is expected that the evaluation will include usage comparisons before and after intervention and data from "treated" groups will be measured against a control group. E1 has initiated discussions with its independent evaluation consultant on the evaluation plan for 2023-2025, inclusive of the Residential Behaviour component.

[Evidence]

Request IR-23:

Page 43 of 65 of the Application: please explain how the inclusion of the quantitative impacts of the avoidance of carbon emissions is consistent and specifically aligned with both provincial and federal legislative initiatives which have been introduced since the time of the last DSM Plan Application.

Response IR-23:

The avoided costs of carbon were included in the 2023-2025 DSM Plan in response to the Nova Scotia Utility and Review Board's (NSUARB) direction in their decision on EfficiencyOne's (E1) 2019 DSM Resource Plan.

Please see the Avoided Costs Brief (Appendix A, Attachment 2 of E1's 2023-2023 DSM Resource Plan Application, pages 7 to 13 of 13) for a full description of the avoided carbon emissions calculations.

The monetary value of carbon emissions that E1 has quantified is the expected Nova Scotia Cap and Trade market value of NS Power emissions avoided due to the energy reductions created by the 2023-2025 DSM Resource Plan. This could constitute avoided utility costs (if DSM helps NS Power avoid purchasing carbon credits), or additional utility revenue (if DSM helps NS Power sell additional carbon credits), or a mix of the two. Whether DSM helps NS Power decrease environmental compliance costs or increase environmental compliance revenues, the result in either case is assumed to be a 'benefit' to ratepayers in the Total Resource Cost and Program Administrator Cost benefit-cost tests. Throughout the DSM Resource Plan Application, it is referred to as an "Avoided Cost."

The amount of carbon emissions avoided due to DSM in each year (the physical quantities of CO_2 equivalent) were calculated by NS Power in the 2020 Integrated Resource Plan (IRP). The amounts were scaled slightly by E1 to account for the fact that the DSM Plan produces savings that differ somewhat from the exact annual Base DSM savings modelled in the IRP. This scaling approach is the same as E1 has historically used when applying energy and capacity avoided costs rates that were calculated from the IRP.

The market price applied to these carbon emissions, up until 2030, is the federal carbon backstop price. Without knowing what the actual Cap and Trade market price will be in each future year, the federal backstop price was selected as the appropriate price based on discussions with the Province. Beyond 2030, E1 assumed that the carbon price would escalate by 2 percent per year, which may be conservative, considering the federal backstop price escalates by 10 percent over the last two years in which it is known ($155/tonne in 2029 to $170/tonne in 2030).

Request IR-24:

Page 43 of 65 of the Application states: "As noted earlier, given recent legislative and policy changes, coupled with the 2020 IRP study timeline, it is reasonable to assume that the IRP's avoided costs are now no longer reflective of the current or future energy landscape in this province. For the avoided costs of capacity and energy, E1 used 2020 IRP Reference Case Scenario 2.0C's outputs."

(a) Please confirm that the proposed 2023-25 DSM plan is transitionally aligned with Scenario 2.0C of NS Power's 2020 IRP.

(b) Please describe the potential impact of NS Power's January 2022 IRP Action Plan Update on E1's projected DSM energy, capacity and GHG emissions savings in 2023, 2024, 2025 and lifetime savings projections.

(c) Please explain why E1 did not use 2020 IRP Reference case 3.1C or 3.2C, both of which involve 2030 retirement of NS Power's coal-fired generating facilities, to determine the avoided costs of capacity and energy.

(d) What incremental DSM spending would be required in 2023, 2024 and 2025 to align E1's proposed 2023-25 DSM plan with the 2020 IRP 3.1C scenario?

(e) What incremental DSM spending would be required in 2023, 2024 and 2025 to align E1's proposed 2023-25 DSM plan with the 2020 IRP 3.2C scenario?

Response IR-24:

(a) Confirmed. EfficiencyOne's (E1) 2023-2025 DSM Plan aligns with 2.0C, which was the Integrated Resource Plan (IRP) Reference case selected by the 2020 IRP.

(b) If avoided costs are updated, these will have no impact on the estimates of energy, capacity, and GHG emissions savings in E1's 2023-2025 DSM Plan Application. Due to the timing of Nova Scotia Power's 2022 IRP update, any such updates to avoided costs or the level of DSM in the IRP Reference Plan may inform the future development of DSM Plans both from the updated avoided costs and potentially the level of DSM. Updates to avoided costs may also impact reporting of the results of the 2023-2025 DSM Plan.

(c) E1 relies on the IRP Reference case as selected in the IRP process in determining both the avoided costs and the level of DSM. For the 2023-2025 DSM Plan, this was Scenario 2.0C. Neither Scenario 3.1C nor Scenario 3.2C were selected and, as such, no avoided costs or the level of DSM were available to inform E1's 2023-2025 DSM Plan. Please refer to E1's response to NSUARB IR-13.

(d) Please refer to part (c) of this IR response.

(e) Please refer to part (c) of this IR response.

Request IR-25:

Page 44-45 of 65 of the Application Table 7:

(a) Please provide an electronic copy (with all formulae intact) of the methodology used to calculate the "Carbon Savings Intensities (tonne/MWh)" noted in Table 7.

(b) Please provide a version of the table that compares IRP Scenario 3.1C with Base-DSM and with No-DSM.

(c) Please provide a version of the table that compares IRP Scenario 3.2C with Base-DSM and with No-DSM.

Response IR-25:

(a) Please refer to Attachment 1 of this IR response (excel file) for the methodology used to calculate the "Carbon Savings Intensities (tonne/MWh)" noted in Table 7 of EfficiencyOne's (E1) Evidence, 2023-2025 DSM Plan Application, page 44.

(b) Annual GWh and CO_2e figures for Scenario 3.1C with No-DSM that would enable this calculation have not been provided to E1 by NS Power and E1 is not aware that this information is available.

(c) Annual GWh and CO_2e figures for Scenario 3.2C with No-DSM that would enable this calculation have not been provided to E1 by NS Power and E1 is not aware that this information is available.

Request IR-26:

Referencing Table 8 on p. 51 of 65,

(a) Please explain whether the annual DSM costs are based on the actual E1 spending in those years or on the Board approved spending levels for those years.

(b) Please show how the DSM $/kWh costs were derived.

(c) In its comparison of DSM costs to fuel costs, E1 used the average cost of fuel for each individual year and compared that against the "lifetime" cost of DSM, not the first-year cost that is actually being paid by ratepayers. Although the lifetime cost appears to spread the first-year cost over multiple years, essentially the equivalent to an amortized capital expenditure, the analysis does not carry over any of the "amortized" portion into subsequent years of the comparison. Could it not be argued that E1's analysis is skewed and does not represent an "out-of-pocket" dollar-to-dollar comparison?

Response IR-26:

(a) The DSM costs are based on EfficiencyOne's (E1) actual spending during each year.

(b) Please refer to Table 1 below for the calculation of $/kWh.

Table 1 – Lifetime Unit Cost per Year

Year	Investment ($ Millions)	Lifetime Energy Savings (kWh)	$ per kWh
2015	32.0	1,778.9	0.018
2016	30.8	1,972.3	0.016
2017	30.3	1,620.8	0.019
2018	34.0	1,778.6	0.019
2019	34.1	1,762.8	0.019
2020	28.4	1,361.3	0.021
2021	36.0	1,548.8	0.023

(c) The annual investment in DSM results in both first year and lifetime energy savings. Lifetime energy savings account for the energy savings over the measure life or the period that a customer will realize the measure benefits. Lifetime energy savings are the appropriate comparator for "out of pocket" dollar to dollar comparison. The kWh savings associated with the installed measure over its useful life results in a corresponding reduction in NS Power's load which is offset by the fuel costs incurred over the measure life. The accuracy of lifetime energy savings are evaluated annually by E1's third-party evaluator and subject to a further analysis and verification by the NSUARB appointed verifier.

[Evidence]

Request IR-27:

On p. 55 of 65, E1 stated that it applied a design objective in its DSM plan to achieve 17% to 22% of total investment in low income support to align with census data regarding prevalence of low income in Nova Scotia.

(a) Has this same design objective been applied to both the preferred and alternate plans?

(b) In developing its DSM Plan to achieve the 17% to 22 % investment level, has E1 taken into consideration low income energy efficiency programs that are funded by other entities such as Emera/NS Power or the Province? If not, please explain.

(c) Please provide details and costs of all low income focused energy efficiency programs currently available in Nova Scotia.

Response IR-27:

(a) The same design objective, 17-22% of total investment in low-income support has been applied to both the Settlement Plan and the Alternate Scenario.

(b) The design objective of achieving 17-22% of total investment proposed in the 2023-2025 DSM Plan to support low-income was applied to the 2023-2025 DSM Plan to achieve a balanced plan which emphasizes the requirement to develop equitable and accessible DSM Plans for all ratepayers. As such the application of the design objective did not include low-income initiatives undertaken by other entities.

(c) EfficiencyOne (E1) operates under a contractual agreement with NS Power for 2020-2022 on delivery of the low-income HomeWarming program funded by Emera. E1 also has a contractual agreement for administration of a low-income program funded by the Province of Nova Scotia (the "PNS Program"). The PNS Program is a non-electricity program. Both programs are operated by E1 in accordance with the contract terms and conditions which include finite contract termination dates. E1 only has information related to existing agreements managed by E1.

[Evidence]

Request IR-28:

On p. 58 or 65, E1 stated:

> **Under the Settlement Plan, an investment of $10.0 million toward DR pilot programming is included with increased annual spending of $1.5 million, $3.5 million, and $5.0 million in succession between 2023 and 2025.**

(a) Please clarify whether the proposed spending in 2023 is $10.0 million or $11.5 million.

(b) What is the proposed spending in 2024 and 2025?

Response IR-28:

(a) Proposed investment in 2023 for demand response as part of the 2023-2025 DSM Plan is $1.5 million.

(b) Proposed investment in 2024 and 2025 for demand response as part of the 2023-2025 DSM Plan is $3.5 million and $5.0 million respectively.

[Evidence]

Request IR-29:

On p. 59 of 65, E1 stated that "the current benefits as examined through the DSM Plan development process have indicated that the utility costs for DR programming outweigh the benefits".

(a) Given that indication, please explain the rationale for allocating millions of dollars in the DSM Plan for DR pilot programming.

(b) E1 has requested that its DR portfolio be considered as a Performance Indicator. In recognition of the large expenditure associated with this portfolio, shouldn't ratepayers be able to hold E1 accountable for its performance by designating the DR portfolio as a Performance Target?

Response IR-29:

(a) Demand Response (DR) was selected in NS Power's 2020 Integrated Resource Plan (IRP) as an important and cost-effective resource strategy for providing grid flexibility to manage peak loads and to incorporate increasing amounts of renewable resources onto the grid. As part of the development of the 2023-2025 DSM Plan, EfficiencyOne (E1) pursued exploration of a DR portfolio in more detail through modelling with E1's modelling consultant Guidehouse and shared results with the DSM Advisory Group (DSMAG). The current modelling results indicate that the total utility costs for DR programming (E1 and NS Power costs) outweigh the utility benefits (avoided costs). However, from a total resource cost perspective (utility + customers), the total benefits do exceed the total costs, which is more relevant given the Total Resource Cost (TRC) test is Nova Scotia's primary

screening test. Additionally, E1 understands that this is an emerging area of importance for the electricity system in Nova Scotia and there are important refinements to the quantified costs and benefits that that will be learned through the 2023-2025 DSM Plan period.

Specifically, the following use cases are currently being examined by E1 and NS Power through on-going pilot work. While these benefits have not yet been quantified and incorporated into cost-effectiveness testing, they are expected to bring additional value to the grid and improve DR cost-effectiveness results:

- intermittent renewable generation following (this may lead to more intermittent renewables being integrated into the system and/or reduced curtailment of renewables. In turn, this could facilitate environmental legislation compliance and avoided costs of carbon);
- ancillary service (fast frequency response);
- ancillary service: 10-minute operating reserves;
- cold load pick-up relief; and
- distribution congestion management.

DR was also identified as a key strategy for mitigating the potential peak impact of electrification measures such as electric vehicles. Without peak mitigation of electrification measures, electrification may drive the need for significant new generation capacity.

Recognizing that this is a significant new development for DSM in Nova Scotia, E1 has included a lower level of DR compared to what was selected through the 2020 IRP process.

E1's DSM Plan is the appropriate place for DR program activities given the co-delivery of energy efficiency and demand response has the following advantages:

- reduced costs through shared resources between energy efficiency and demand response (such as marketing, program administration, measurement and verification);
- E1 has valuable experience in delivering similar types of programs. This experience will assist in activities such as marketing; recruitment; procurement; delivering incentives; delivery agent management; tracking and reporting; and measurement and verification;
- improved customer experience by delivering integrated energy efficiency and demand response programs with one point of contact; and
- E1 has strong brand awareness and customer satisfaction that can help recruit customer to demand response offerings.

(b) For the first time, E1 is proposing targeted Demand Response activities. DR has proven challenging in that it is new in E1's portfolio and has required significant time to develop and implement. Since 2019, E1 and NS Power have been working collaboratively to develop, assess and evaluate DR pilot programs; however, due to the COVID-19 pandemic, progress on this has been delayed.

E1 is committed to transparency by including in the DSM Quarterly and Annual Progress Report updates on both spending and savings, with the understanding that the Nova Scotia Utility and Review Board (NSUARB) can request at their discretion more frequent updates and further information on E1's progress in the implementation of demand response. Additionally, demand response will be subject to third-party evaluation with these results included in E1's annual evaluation results filed with the NSUARB.

Request IR-30:

Regarding Performance Targets, E1 currently only has two targets to satisfy. Those are cumulative (3-year) annual energy savings and cumulative (3-year) annual peak demand savings. The proposed 2023-2025 DSM Plan requests approval of $173 million in cumulative expenditures, ranging from $53.1 million in 2023 to $62.5 million in 2025. This is a substantial 57% increase over the previous 3-year approval. On an annual basis it is about 70% greater than the annual spending since 2016. Considering this large increase, the general concern about rates, and ongoing emphasis on NS Power's annual performance, please explain why E1, as a mature organization, should not be subjected to additional or annual performance targets.

Response IR-30:

The 2020-2022 DSM Plan did anticipate a steady increase in both the investment and savings over the three-year period, starting at $34.4 million in 2020 and increasing to $41.0 million by 2022. This change in investment, by 29.5% from 2022 to 2023, is predominantly the result of increased focus on low-income and small business program offerings to provide bill savings and offset possible electricity rate increases. The re-introduction of a whole home low-income program component (Affordable Single-family Homes) was required to maintain access to and equity within EfficiencyOne's (E1) portfolio, a design requirement under the Balanced Plan Approach, for participants who are most impacted by increased costs.

Since 2010, E1 has demonstrated that investments in energy efficiency do result in bill savings for customers, particularly for those customers who participate in programs. Both the Historical and Forward-Looking Rate and Bill Impact Analysis Reports are provided as support for E1's application. For customers participating in an E1 program, bill savings can more than offset any

increase in the DSM investment proposed in the 2023-2025 DSM Plan in addition to helping to offset any potential electricity rate increases.

E1 has not requested changes to the existing or introduction of additional performance targets as part of this Application because the accountability of these continue to be relevant and reflective of the energy efficiency sector. Additionally, DSM is a low-risk investment for ratepayers and, as a not-for-profit, E1 has a strict focus on remaining within the spending levels approved, with any underspending, returned to ratepayers.

The two existing Performance Targets, cumulative (3-year) annual energy savings and cumulative (3-year) annual peak demand savings, represent the key factors required to assess the relative performance of E1 against the Nova Scotia Utility and Review Board (NSUARB) approved energy and demand savings target within a NSUARB-approved investment level. Cumulative three-year performance targets provide greater flexibility to respond to changing circumstances that may occur in any individual year than would be available with annual performance targets. Notwithstanding the two Performance Targets, E1 remains subject to the specific legislative provisions of the *Public Utility Act* (the "*Act*") relating to the operation of the electricity efficiency and conservation franchise; the general oversight provisions of the NSUARB generally (s. 79G); and the terms and conditions of Grant of Franchise as issued by the Minister of Natural Resources and Renewables. In addition, unlike more traditional for-profit utilities, E1 is subject to the further requirement that it enter into three (3) year contractual agreements with NS Power (s.79J), detailing the nature of the energy efficiency and conservation activities it proposes to supply to NS Power ratepayers – all of which is subject to the review and approval of the NSUARB (s.79L).

Request IR-31:

Appendix A, page 32 of 149: please describe the modelling quality assurance process in more detail. Within this response, please specially address how this process ensures accuracy in all assumption and variables used in the DSM Plan modelling process.

Response IR-31:

For energy efficiency measures in the ProCESS model, both EfficiencyOne (E1) and its modelling consultant Guidehouse performed Quality Assurance (QA) activities. For demand response measures in the DRSim model, Guidehouse performed all QA activities.

The following ProCESS model QA activities were performed by E1 staff who did not have modelling responsibilities to ensure E1 maintained segregation of duties:

- reviewed and validated the lists of indices used by the model, as well as the assignment of index values to each measure (e.g. assignment of measures to program components, programs, sectors, end-uses, etc.);
- reviewed avoided cost inputs from source documents and validated model inputs;
- reviewed and validated fixed and variable administration cost inputs;
- reviewed and validated NS Power inputs, including Weighted Average Cost of Capital (WACC), electricity rates, and line losses;
- reviewed and validated GHG intensity inputs;
- recalculated and validated variable administration costs for each measure;
- ensured the inflation rate of 2 percent per year was consistently applied to incremental costs, variable administration costs, and direct installation costs;
- reviewed that net-to-gross ratios, measures lives, and energy and demand savings were correctly copied into the model from source development workbooks;

- reviewed and validated energy and demand savings assumptions for individual measures;
- reviewed and validated compilation of technical tables from raw model outputs;
- reviewed and validated the translation of raw model outputs into tables of various metrics by program, program component, and year;
- reviewed and validated the calculation of low-income impacts;
- reviewed and validated the preparation of 'payback' curves comparing annual investment to annual avoided costs by rate class; and
- reviewed and validated the calculation of other assorted metrics included in filing tables that were calculated based on model outputs.

Guidehouse QA activities for the ProCESS model included:

- fully vetted model import template format to ensure model readability, correct usage, and data validations;
- reviewed raw imported model variables to confirm global data accuracy;
- compared in-model aggregated savings and budgets to import template calculated values at the portfolio-, sector-, program-, and component-levels;
- reviewed in-model settings after each iteration to confirm appropriate treatment of all variables and cost test formations; and
- reviewed model exports for consistency with expected savings and budget values as well as cost test formations.

Guidehouse QA activities for the DRSim model included:

- reviewed and validated the lists of indices used by the model, as well as the assignment of index values to each measure (e.g., assignment of measures to program components, programs, sectors, end-uses, etc.);

- reviewed and validated all inputs pertaining to market characterization and baseline projections, enrollment, unit impacts, itemized costs, avoided costs and global parameters;
- reviewed inputs during the modelling process after every iteration and cross-checked with results for each iteration to ensure input changes were reflected in the results;
- fully vetted model import template format to ensure model readability, correct usage, and data validations;
- QA of results after each iteration through a comprehensive set of outputs and ensured there were no anomalies, and the results were consistent with the expected changes; and
- engaged in multiple joint review sessions with E1 to vet input assumptions and results.

Request IR-32:

Appendix A, page 34 of 149: please explain why the TRC calculation for Energy Efficiency considers only the cost and benefits impact over the three-year DSM plan period, while for Demand Reduction the cost and benefit impacts are levelized over a ten-year timeframe.

Response IR-32:

EfficiencyOne (E1) wishes to clarify that the Total Resource Cost (TRC) calculation for energy efficiency considers the costs incurred in a particular year of energy efficiency implementation programming, and a net Present Value of all associated DSM benefits over the life of the implemented measures. In the 2023-2025 DSM Resource Plan, the lifetimes of installed energy efficiency measures ranges from 1 to 36 years. The costs and benefits associated with energy efficiency measures within the 2023-2025 DSM Resource Plan relate to those activities conducted as part of the plan.

For Demand Response (DR), the lifetime of expected benefits associated with each Demand Response program measure is one year, but support a program development and recruitment cycle that repeats every 10 years. In certain pathways within DR (i.e. domestic hot water load management, smart thermostat programs), this equates to the expected technical life of the equipment that is being controlled (i.e. domestic hot water systems and associated controllers, smart thermostat life). It also aligns with a typical program life, after which point a significant re-work of the program may be required (i.e. overall program review, updated technologies and controls, new marketing and recruitment). Consideration of a 10-year timeframe for assessing cost-effectiveness of a DR program allows appropriate consideration of upfront program development and technology enablement costs and accrual of benefits associated with these costs over the lifetime of the program. The levelized view of costs and benefits provides an

assessment of the relative economic value of a full life cycle of Demand Response activities, as opposed to providing a focus on particular start-up costs, which are intended to support all ten years of the first DR cycle. The DR Technical Tables (Appendix A, Attachment 6 of E1's 2023-2025 DSM Plan Application) reflect a 10-year program life cycle based on reasonable scaling of DR programs in order to most accurately capture the complete benefits and costs. Assuming that the proposed DR program performs as expected, it is reasonable to assume the DR program will continue in some form beyond 2025, so that the benefits from resources acquired in 2023-2025 can continue to be realized. This is supported by NS Power's Integrated Resource Plan (IRP) which includes Demand Response programs in all years once launched.

Request IR-33:

Appendix A, page 53 of 149: With respect to proposed Residential Programs and Services, E1 states: "E1 will evolve program and service offerings by taking advantage of new technologies and customer data to achieve energy savings from larger, more complex projects that are often more expensive to implement but produce higher, and longer lasting, energy savings."

(a) Please describe the new technologies and customer data that E1 intends to achieve energy savings from these larger and more complex projects.

(b) Which of the proposed residential program components and services in the 2023-25 DSM Plan are representative of these larger, more complex and more expensive projects?

Response IR-33:

(a) The following are examples of new technologies EfficiencyOne (E1) has included:

- An expanded list of eligible ENERGY STAR® equipment models through Instant Savings. This may include dishwashers, bathroom fans, air conditioning units and kitchen range hoods.
- Electrician-installed measures through Efficient Product Installation, including smart thermostats for electric baseboards, dimmer switches, indoor and outdoor motion sensors, dimmable motion sensors, and LED fixtures with embedded motion sensors.

The following are examples of the use of customer data, including Advanced Metering Infrastructure data E1 has included:

- targeted marketing based on electricity use patterns;

- provision of home energy reports based on electricity use patterns and customer-entered building and occupancy characteristics;
- provision of behavioural demand response event notifications;
- determining potential for, and evaluation of, process improvements or changes to program delivery;
- testing alternative marketing approaches; and
- piloting new technologies and delivery approaches.

(b) The examples of new technologies mentioned in the response to part (a) are included in Instant Savings and Efficient Product Installation. Large, complex projects will also be undertaken in Affordable Multi-family Housing, Home Energy Assessment, Green Heat, Mi'kmaw Home Energy Efficiency Project, and Affordable Single-family Homes.

Request IR-34:

Appendix A, pages 56-57 of 149, Table 18: Please explain why the expected participation (products) for "low income" is so low (approx. 1%) relative to the total number of expected participants (products) in the Residential Appliance Retirement Program Component.

Response IR-34:

In the 2023-2025 DSM Resource Plan, appliance replacements (which are exclusively provided for low-income Nova Scotians) are not included in the Appliance Retirement program component. They are instead included under the Affordable Single-family Homes and Mi'kmaw Home Energy Efficiency Project program components.

Regarding appliance retirements, EfficiencyOne (E1) does not have primary research data indicating the actual proportion of low-income Nova Scotians participating in the Appliance Retirement program component. E1 applied an estimate provided by the Affordable Energy Coalition (AEC) that low-income Nova Scotians are 10% as likely to participate as the general population. The calculation also assumed that the overall prevalence of low-income Nova Scotians was 11.1%.

The calculation was as follows:

(11.1% overall prevalence) * (10% factor from AEC) = 1.11% of Appliance Retirement impacts attributed to low-income participants.

For further information on the estimation of DSM low-income impacts for the 2023-2025 DSM Plan, please refer to Attachment 1 of E1's response to CA IR-02.

Request IR-35:

Appendix A, pages 58-59 of 149, Table 19: Please explain why the expected participation (products) for "low income" is so low (approx. 1%) relative to the total number of expected participants (products) in the Residential Instant Savings Program Component.

Response IR-35:

EfficiencyOne (E1) does not have primary research data indicating the actual proportion of low-income Nova Scotians participating in Instant Savings. E1 applied an estimate provided by the Affordable Energy Coalition (AEC) that low-income Nova Scotians are 10 percent as likely to participate as the general population. The calculation also assumed that the overall prevalence of low-income Nova Scotians was 11.1 percent.

The calculation was as follows:

(11.1% overall prevalence) * (10% factor from AEC) = 1.11% of Instant Savings impacts attributed to low-income participants.

For further information on the estimation of DSM low-income impacts for the 2023-2025 DSM Plan, please refer to Attachment 1 of EfficiencyOne's response to CA IR-02.

Request IR-36:

Appendix A, pages 67 of 149, Table 24: The Enhancements for 2023-25 notes that the "Affordable Multi-Family Housing & Non-Profit Organizations Program Component" will introduce new ways to access rebates for heat pumps, primarily mini-splits, and heat pump water heater measures. Pleas describe these new ways to access rebates.

Response IR-36:

Measures such as heat pumps and heat pump water heaters will now be available to smaller buildings (1-3 units) through the new prescriptive stream of the Affordable Multi-family Housing and Non-Profit Organization program component. The prescriptive stream does not require an audit. Prior to this enhancement, participating buildings were required to have a minimum of four affordable units and incentives on heat pump measures required an audit.

Request IR-37:

Appendix A, pages 78-79 of 149, Residential Behaviour Program Component:

(a) Please explain how this program component is different than initiatives that will be undertaken by NS Power related to availability of AMI data (such as TVP and CPP program, Bill Alerts, Customer Web Portal and Customer Energy Management (CEM) System).

i) Please explain how the proposed "opt-out home energy reporting service" will be different than the Bill Alert and Web Portal reporting that will be offered by NS Power.

ii) Please explain how E1 will track the energy savings associated with this program component to ensure there is no overlap in reporting of energy savings resulting from these NS Power initiatives.

iii) Please explain how the projected energy savings noted in Table 30 were calculated to ensure that the projected savings do include savings that result from these NS Power initiatives.

Response IR-37:

(a) Please refer to EfficiencyOne's response to NSUARB IR-22.

Request IR-38:

Appendix A, pages 91-92 of 149, Table 39: Please explain why the expected participation (products) for "low income" is so low (approx. 1%) relative to the total number of expected participants (products) in the Business Energy Rebates Program Component.

Response IR-38:

Low-income participation estimates were calculated based on the reported low-income participation in the last complete year at the time of DSM Resource Plan development, 2020, and 1 percent was the value reported at that time.

EfficiencyOne (E1) does not have primary research data indicating the actual proportion of low-income Nova Scotians participating in, or benefiting from Business Energy Rebates (BER). Its 2020 estimate of incidental low-income participation in BER Mail-In is based on the assumption that only BER Mail-In projects implemented in residential buildings would produce low-income benefits. Research commissioned by E1 in 2015 estimated that 53 percent of 1-bedroom apartment units housed low-income tenants, and that 57 percent of 2-4 bedroom apartment units housed low-income tenants. E1 uses the average, 55 percent, as an estimate of the prevalence of low-income Nova Scotians living in multi-unit buildings.

In 2020, 55 percent of energy savings, demand savings, participation values and program costs for measures installed in apartment buildings through BER Mail-In were estimated to benefit low-income Nova Scotians. Expressed as a percent of total BER impacts, this is the roughly 1 percent referenced in the question.

Since customer information is not tracked for BER Instant Rebates, E1 does not know which measures are installed in apartment buildings. E1 therefore assumed the same proportion of low-income impacts would stem from BER Instant Rebates as they do from BER Mail-In.

For further information on the estimation of DSM low-income impacts for the 2023-2025 DSM Plan, please refer to Attachment 1 of EfficiencyOne's response to CA IR-02.

Request IR-39:

Appendix A, pages 98 of 149: Please describe the criteria to determine what types of facilities, projects, measures and costs are eligible for the Custom Program Component.

Response IR-39:

The criteria used to determine eligibility for the Custom program component is listed below. This includes criteria specific to the following services within the Custom program component: Retrofit, Building Optimization, and New Construction.

Facility eligibility criteria include the following:

- All facilities must be institutional, non-profit, commercial, or industrial, and served directly or indirectly by Nova Scotia Power.
- For the Retrofit service, facilities must consume at least 350,000 kWh of electricity annually. Exceptions may occur when the proposed project cannot be supported by another program, such as non-profit, charitable, or solar PV for facilities that consume less than 350,000 kWh annually. Multiple smaller facilities may also be grouped together for a project.
- For the Building Optimization service, facilities must consume at least 350,000 kWh of electricity annually. Only single facility projects are eligible. A building automation system must be present and operational. The facility cannot have been commissioned in the last three years.
- For the New Construction service, only single facility projects are eligible. This service supports the pre-construction of new buildings, additions to existing buildings, or major renovations. The proposed facility is to be at least 15,000 square feet.

Project eligibility criteria include the following:

- All projects must reduce or offset electrical energy or demand. The savings from a project cannot exceed the actual usage provided by Nova Scotia Power (where baseline data exists).
- For the Retrofit service, energy savings projects must produce a minimum of 10,000 kWh of first-year energy savings. Eligible projects have a maximum payback period of 15 years before Efficiency Nova Scotia incentives are applied.
- For the New Construction service, the project must follow Part 3 of the National Building Code (Part 9 buildings are not eligible). The project must be in design phase (pre-construction). Total conditioned area must be at least 15,000 ft^2. The project must be located in Nova Scotia and save electrical energy. The Project must be defined as one of the following: a new structure, an addition to an existing structure, or a major renovation (renovation projects assessed on a case-by-case basis). The project must implement at least two energy efficient measures. The project must achieve a reduction in total building energy consumption of at least 25% relative to the baseline and must save at least 100,000 kWh of electricity. (Information on the baseline is available to participants through the New Construction Program Guide.)

Measure eligibility criteria include the following:

- Measures must save electrical energy or reduce utility peak demand and not have a prescriptive rebate available (unless part of a larger project such as an Energy Performance Contract).

Eligible costs under the Custom program component include the following:

- Engineering costs (consultant or in-house);
- Equipment purchases and delivery costs;
- Installation and commissioning labour; and

- Harmonized Sales Tax that is not eligible for Canadian Revenue Agency rebates.

Request IR-40:

Appendix B – Attachment 1 – 2023-2025 Summary Results (Settlement and Alternate): Please provide an updated electronic version of the Attachment with all formulae intact.

Response IR-40:

Appendix B – Attachment 1 – 2023-2025 Summary Results is a compilation of key results from the rate and bill impact analysis (RBIA) models themselves, which were copied and pasted as values into this attachment for simple comparison between the Settlement Plan and Alternate Scenario.

For full details, formulas and calculations for each data point please refer to the RBIA models, filed electronically as Appendix B, Attachments 6 to 9. Appendix B, Attachment 1 (as filed) includes all formulae intact that EfficiencyOne (E1) used in this document. For ease of view, please refer to Attachment 1 of this IR response for an annotated version of Appendix B – Attachment 1 – 2023-2025 Summary Results (Settlement Plan and Alternate Scenario), which describes what data was copied from the RBIA models and where, in the model, the information is located so that it can be more closely examined within the source material.

Request IR-41:

Appendix B – Attachment 6 – NS Power Rate Model (Settlement Plan): Please provide an updated electronic version of the Attachment with all formulae intact to show how the calculation of "Cost of Carbon ($/MWh)" in Tab "E1 Data Inputs".

Response IR-41:

The Avoided Cost of Carbon calculation was performed outside the NS Power's Rate Model and copied as values into the column referenced above ("E1 Data Inputs").

Please refer to EfficiencyOne's response to NSUARB IR-25, specifically Attachment 1 (filed electronically) for the calculation of the Avoided Cost of Carbon ($/MWh) in each year.