

EfficiencyOne

IN THE MATTER OF The Public Utilities Act,
RSNS 1989, c 380, as amended,

- and –

IN THE MATTER OF EfficiencyOne's 2018
Annual Progress Report.

EfficiencyOne 2018 DSM Annual Progress Report

Date Filed:
March 29, 2019



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2018 DSM RESULTS

In its Order dated October 7, 2015, the Nova Scotia Utility and Review Board (NSUARB) approved the 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.¹ The NSUARB Order approved a 2018 DSM investment of \$34.9 million with corresponding net incremental energy savings of 136.3 GWh and net peak demand savings of 21.0 MW. The 2018 mid-course adjusted planned net incremental energy savings and net peak demand savings for 2018 were 138.3 GWh and 25.9 MW respectively, with a planned investment of \$33.9 million. The 2018 mid-course adjustments considered the annual cumulative results from 2016 and 2017, and reflected the planned net incremental energy savings required to meet the Performance Targets for the 2016-2018 Plan period, as approved by the NSUARB.² Performance Targets of 405.9 GWh and 62.5 MW were set for the three-year Plan period (2016-2018), rather than annually, and are discussed further in Section 1 of this report.

Table 1 provides a breakdown of the 2018 expenditures and the evaluated net incremental energy and net peak demand savings results by program, for comparison with the 2016-2018 DSM Plan Compliance Filing³ and the 2018 mid-course adjustment. Table 2 provides program participation data and Table 3 provides a breakdown of unit costs.

¹ See M06733, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* [NSUARB Order], [7 Oct 2015].

² The 2018 mid-course adjusted savings were designed to achieve the planned first-year energy savings in the 2016-2018 Compliance Filing. EfficiencyOne's DSM portfolio comprises measures that primarily achieve both energy and demand savings, i.e. energy and demand savings are proportional for most measures. The level of first-year energy savings required in 2018 to achieve the first-year energy savings Performance Target in the 2016-2018 Compliance Filing was anticipated to produce demand savings higher than in the 2016-2018 Compliance Filing. As such, the 2018 Mid-Course Adjustment reflected this anticipated increase in demand savings.

³ *Supra* note 1 [Compliance Filing], [15 Sept 2015] at Schedule E, p. 6.

1 Table 1: 2018 Planned Savings, Mid-Course Adjustments, and Results

		2018 Plan as Filed				2018 Mid-Course Adjustment				2018 Results				
		First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh) ¹	Peak Demand Savings (MW)	Budget (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh) ¹	Peak Demand Savings (MW)	Budget (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh) ¹	Peak Demand Savings (MW)	Expenditures (\$ million)	Program Status ²
Residential	Efficient Product Rebates	12.6	122.3	1.1	3.4	19.3	171.3	2.6	4.2	24.6	209.2	3.0	4.2	●
	Instant Savings					16.2	148.5	2.1	2.7	21.9	189.3	2.6	2.9	
	Appliance Retirement					3.1	22.8	0.4	1.5	2.7	19.8	0.4	1.3	
	Existing Residential	43.0	850.5	7.9	11.1	28.5	370.3	8.0	7.4	22.7	298.8	7.1	6.4	●
	Home Energy Assessment					7.5	149.2	2.1	2.4	5.7	114.5	1.6	2.0	
	Green Heat					3.7	66.1	3.8	1.3	4.2	76.3	4.0	1.4	
	Efficient Product Installation ³					17.1	150.1	2.0	3.3	12.8	108.0	1.5	2.8	
	First Nations Home Energy Efficiency Pilot					0.4	4.8	0.1	0.4	0.0	0.0	0.0	0.1	
	New Residential	4.0	120.0	1.1	1.3	4.6	137.2	1.3	2.0	4.5	135.7	1.3	2.4	●
	New Home Construction					4.6	137.2	1.3	2.0	4.5	135.7	1.3	2.4	
Business, Non-Profit and Institutional (BNI)	Residential Subtotal	59.6	1,092.8	10.1	15.8	52.4	678.8	11.8	13.6	51.8	643.6	11.3	13.0	
	Low Income ⁴	7.3	133.9	0.9	1.8	8.6	75.4	1.1	2.1	5.3	42.9	0.7	1.2	
	Efficient Product Rebates	32.6	435.5	5.2	5.7	50.6	593.9	7.9	7.8	75.3	852.1	11.3	9.0	●
	Business Energy Rebates					50.6	593.9	7.9	7.8	75.3	852.1	11.3	9.0	
	Custom Incentives	34.4	527.4	4.3	6.5	25.8	366.9	4.5	5.1	14.7	164.1	1.4	4.2	●
	Custom					24.2	362.1	4.2	4.2	11.6	156.1	1.2	3.6	
	Energy Management Information Systems					0.9	2.7	0.2	0.4	1.6	3.7	0.1	0.2	
	Strategic Energy Management					0.7	2.0	0.1	0.6	1.5	4.4	0.2	0.5	
	Direct Installation	9.6	135.0	1.3	3.6	9.6	122.5	1.7	4.0	9.6	118.8	1.4	4.4	●
	Small Business Energy Solutions					9.6	122.5	1.7	4.0	9.6	118.8	1.4	4.4	
Totals	BNI Subtotal	76.6	1,097.9	10.8	15.8	86.0	1,083.3	14.1	17.0	99.6	1,135.0	14.2	17.6	
	Low Income ⁴	-	-	-	-	6.1	75.6	1.2	1.0	3.7	44.1	0.8	0.6	
	Programs subtotal	136.3	2,190.7	21.0	31.6	138.3	1,762.1	25.9	30.6	151.4	1,778.6	25.5	30.7	
	Enabling Strategies	-	-	-	3.3	-	-	-	3.3	-	-	-	3.3	
	Total	136.3	2,190.7	21.0	34.9	138.3	1,762.1	25.9	33.9	151.4	1,778.6	25.5	33.9	

2 Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification.

3 Expenditure amounts are unaudited. Savings and expenditures in previous quarters may have been updated and are reflected in the year-end totals.

4 ¹ As agreed to in the NSUARB-approved 2016-2018 DSM Plan Consensus Agreement, EfficiencyOne is now reporting on lifetime energy savings. See M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix D, Appendix "A", item 3(c)(iii) (available on CanLII). The methodology for estimating lifetime energy savings for the 2018 Mid-Course Adjustments and 2018 results is more sophisticated than that used in the NSUARB-approved 2016-2018 DSM Plan.

9 ² Green denotes a variance of less than 10% below the planned annual energy savings, yellow denotes a variance of 10% to 25% below the planned annual energy savings, and red denotes a variance of greater than 25% below the planned annual energy savings. For more information on these variances, please refer to the relevant program description sections of this report.

10 ³ Efficient Product Installation (EPI) comprises the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components, within the Existing Residential Program. These two program components merged to form EPI on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia.

11 ⁴ Reflects tracked and estimated participation by low-income participants; numbers are included in the overall Efficient Product Rebates (Residential and BNI), Existing Residential, Custom Incentives, and Direct Installation programs.

Table 2: 2018 Participation Rates

		Participation Rates	
		2018	Participation Unit
Residential	Efficient Product Rebates		
	Instant Savings	669,550	Units rebated
	Appliance Retirement	5,595	Units rebated
	Existing Residential		
	Home Energy Assessment ¹	791	Housing units
	Green Heat ¹	2,718	Housing units
	Efficient Product Installation ¹	10,813	Housing units
Business, Non-Profit and Institutional (BNI)	First Nations Home Energy Efficiency Pilot ¹	0	Housing units
	New Residential		
	New Home Construction	652	Participants
	Efficient Product Rebates		
	Business Energy Rebates - Mail-In	119,808	Units rebated
	Business Energy Rebates - Instant	506,533	Units rebated
	Custom Incentives		
	Custom ²	79	Projects
	Energy Management Information Systems ³	2	Participants
	Strategic Energy Management ³	4	Participants
	Direct Installation		
	Small Business Energy Solutions	529	Projects

Participation results reported in previous quarters may have been updated and are reflected in the year-end totals. Please refer to Table 10 for estimates of low-income participation in program components.

¹“Participation Unit” refers to completed projects/homes.

²“Participation Unit” refers to Custom projects where savings have been claimed in 2018, including partial projects.

³ Each participating EMIS and SEM project is counted once for the year, although participation in the program component is ongoing and most facilities generate savings every month.

Table 3: 2018 Unit Cost

		First-Year Unit Cost (\$/kWh)		
		2018 Plan as Filed	2018 Mid-Course Adjustment	2018 Actual
Residential	Efficient Product Rebates	0.27	0.22	0.17
	Instant Savings			
	Appliance Retirement			
	Existing Residential	0.26	0.26	0.28
	Home Energy Assessment			
	Green Heat			
	Efficient Product Installation			
	First Nations Home Energy Efficiency Pilot			
Business, Non-Profit and Institutional (BNI)	New Residential	0.33	0.44	0.53
	New Home Construction			
	Residential Subtotal	0.27	0.26	0.25
	Low Income*	0.24	0.25	0.23
Business, Non-Profit and Institutional (BNI)	Efficient Product Rebates	0.17	0.15	0.12
	Business Energy Rebates - Mail-In			
	Business Energy Rebates - Instant Rebates			
	Custom Incentives	0.19	0.20	0.29
	Custom			
	Energy Management Information Systems			
	Strategic Energy Management			
	Direct Installation	0.38	0.42	0.46
Total	Small Business Energy Solutions			
	BNI Subtotal	0.21	0.20	0.18
	Low Income*	-	0.17	0.17
Total	Programs Total	0.23	0.22	0.20
	Enabling Strategies	-	-	-
	Total	0.26	0.25	0.22

First-year unit cost is provided to two decimal places due to the relative magnitude of the figures. EfficiencyOne provides comment on unit cost variances (year-end unit cost as compared to mid-course adjusted unit cost) of 10 percent or more; please refer to the relevant program sections of this report for further information. Unit costs are calculated using evaluated energy and demand savings at the generator, net of free-ridership and spillover (pending verification), and unaudited expenditure amounts.

*Reflects tracked and estimated participation by low-income participants; numbers are included in the overall Efficient Product Rebates (Residential and BNI), Existing Residential, Custom Incentives, and Direct Installation programs.

1.1 2018 DSM Programs

In 2018, EfficiencyOne achieved total net incremental energy savings at the generator, for all DSM programs, of 151.4 GWh, compared to the mid-course adjusted planned savings amount of 138.3 GWh. Total net peak demand savings at the generator, for all

DSM programs, were 25.5 MW, compared to the mid-course adjusted planned savings amount of 25.9 MW. Total expenditures were \$33.9 million, compared to the mid-course adjusted planned investment of \$33.9 million. These savings and expenditures include results from both the Residential and the Business, Non-Profit and Institutional (BNI) sectors. Total ratepayer benefits resulting from 2018 energy savings are \$147.6 million.⁴ Individual program results are presented in the following sections and are compared to the 2018 mid-course adjustments at the program level.

Using the average Nova Scotia Power Inc. (NS Power) emissions intensity for 2017, EfficiencyOne's Evaluation Consultant found that DSM measures installed in 2018 are estimated to result in 92.7 kt of annual avoided CO₂e emissions.

Measurement and Evaluation

In 2018, EfficiencyOne conducted DSM program evaluations and program support process evaluations for ENS's Efficiency Trade Network (ETN) and Quality Assurance.

In 2018, all program components underwent an impact evaluation. In addition, all program components, with the exception of Home Energy Assessment and New Home Construction, underwent a market evaluation, and Small Business Energy Solutions underwent a reduced market evaluation.⁵

Impact evaluations assess net incremental energy and net peak demand savings, while market evaluations characterize market conditions, assess program satisfaction, and monitor market evolution. For select program components, the number of market and impact evaluations were reduced as compared to 2017. This is a result of key savings

⁴ Lifetime benefits are expressed as the net present value of the avoided costs, including energy and capacity, over the life of the program measures.

⁵ For more information regarding the rationale for this decision, please see the 2018 DSM Programs Evaluation *Executive Summary: Efficiency Nova Scotia*, 18 March 2019, p. 5-6.

1 and market parameters remaining stable for several years, as well as an absence of
2 program changes expected to cause fluctuations in these parameters.⁶

3
4 Three program components also underwent process evaluations: New Home
5 Construction; Business Energy Rebates; and Custom (New Construction service only).
6 Process evaluations review program design, effectiveness of program administration
7 and delivery, barriers to program delivery, effectiveness of tracking systems, and
8 opportunities for improvement.

9
10 The 2018 Evaluation Reports are filed concurrently with this Annual Progress Report.

11
12 Finally, further to the 2018 evaluated net incremental energy and net peak demand
13 savings attributable to DSM programs, the 2018 evaluated net incremental energy
14 savings for Codes and Standards were 23.8 GWh with net peak demand savings of 4.0
15 MW. Since savings from Codes and Standards occur outside of DSM programs, they
16 are not included in the savings results which contribute to the achievement of
17 EfficiencyOne's Performance Targets.

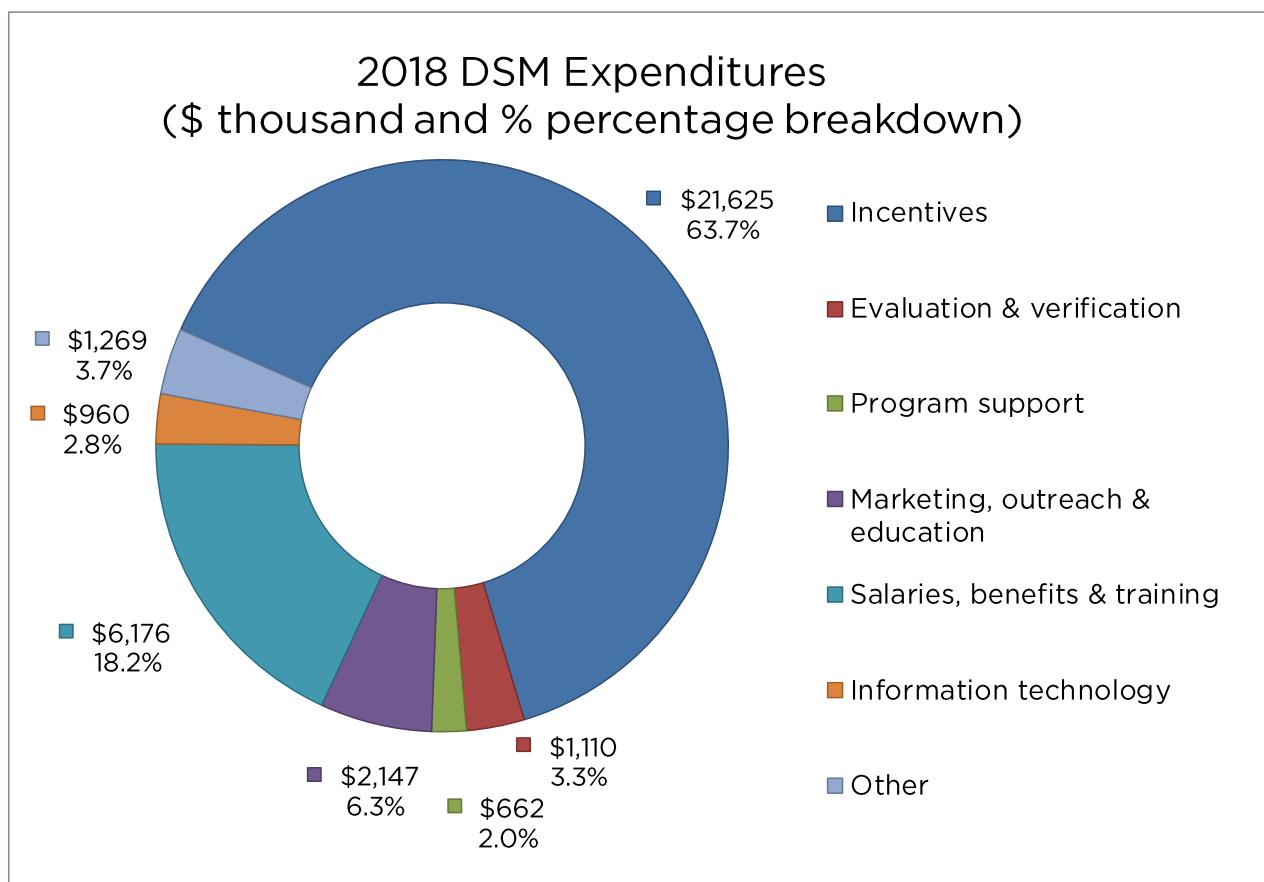
18 19 **Rate Class Expenditures**

20
21 EfficiencyOne remains committed to reporting on rate class expenditures, while
22 aiming to achieve its planned energy savings within the approved investment amount.
23 Please see section 4 for 2015, 2016, 2017, and 2018 planned and actual⁷ DSM
24 expenditures by rate class. Figure 1 presents EfficiencyOne's 2018 DSM expenditures.

⁶ *Ibid.* The program components selected for reduced impact evaluations were Home Energy Assessment, Efficient Product Installation and Small Business Energy Solutions.

⁷ Expenditures for 2018 are unaudited.

Figure 1: 2018 DSM Expenditures



Expenditure amounts are unaudited and are rounded to the nearest thousand. Expenditure amounts reported in previous quarters may have been updated and are reflected in the 2018 annual total.

In 2018, EfficiencyOne continued to provide programs and services for low- and modest-income homeowners and renters, other households, and a wide variety of businesses. Awareness of, and participation in, programs and services were facilitated through advertising, media engagements, social media, and community outreach initiatives.

Work also continued on pilot projects within both the Residential and BNI sectors to build a diverse program and measure portfolio that responds to market needs. These initiatives were designed based on EfficiencyOne's expertise in delivering electricity efficiency activities in Nova Scotia and are detailed in the relevant program sections below.

1 In addition, a strong social media presence was maintained through platforms
2 including Facebook, Twitter, Instagram, YouTube, and LinkedIn. Unaided awareness of
3 ENS was 35 percent at the end of 2018. Customer service also remained a top priority
4 in 2018, with ENS achieving a Customer Satisfaction Index of 91.0 (out of 100).

5 6 **Data Tracking System**

7
8 As identified in the Compliance Filing for the 2016-2018 DSM Resource Plan,
9 EfficiencyOne is implementing a new DSM data tracking system.⁸ The system will help
10 participants by:

- 11 • providing improved service experience through enhanced tracking of
- 12 participants' historical interactions; and
- 13 • enabling EfficiencyOne to optimize communication with participants to provide
- 14 better participant life-cycle messaging and marketing.

15
16 The system will create efficiencies for program delivery, research, and marketing
17 purposes through:

- 18 • reduced time spent on data processing and reporting;
- 19 • a reduction in the number of external consultants required to develop reporting
- 20 capabilities; and
- 21 • improved program uptake using database marketing techniques.

22
23 In 2018, EfficiencyOne continued implementing the new DSM data tracking system and
24 worked with the vendor to mitigate risks associated with delays that occurred in 2017
25 due to vendor development issues. EfficiencyOne contracted an external expert in
26 2018 and several governance and process improvements were identified as part of a
27 remediation plan. EfficiencyOne worked with the vendor throughout 2018 to
28 implement identified remediation plan activities and to update the project plan.

⁸ *Supra* note 1 [Compliance Filing], [15 Sept 2015] at Schedule E, p 24.

1.2 Residential Sector Results

In 2018, the Residential sector achieved net incremental energy savings of 51.8 GWh and net peak demand savings of 11.3 MW compared to the mid-course adjusted planned savings of 52.4 GWh and 11.8 MW, respectively. The Residential sector comprises the following programs:

- Residential Efficient Product Rebates;
- Existing Residential; and
- New Residential.

1.2.1 Residential Efficient Product Rebates

In 2018, the Residential Efficient Product Rebates (EPR) program achieved net incremental energy savings of 24.6 GWh and net peak demand savings of 3.0 MW, as compared to the mid-course adjusted planned savings of 19.3 GWh and 2.6 MW, respectively. The Residential EPR program comprises the following program components:

- Instant Savings; and
- Appliance Retirement.

A breakdown of net incremental energy and net peak demand savings, expenditures, and participation by rate class for Residential EPR is presented in Table 4, below.

Table 4: Residential EPR Rate Class Results

	Residential Efficient Product Rebates - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)	24.1	205.1	2.9	4,153	662,776
Small General (10)*	0.0	0.2	0.0	12	64
General Demand (11)*	0.0	0.2	0.0	14	72
Large General (12)*	0.0	0.0	0.0	0	0
Small Industrial (21)*	0.0	0.0	0.0	1	11
Medium Industrial (22)*	0.0	0.0	0.0	0	0
Large Industrial (23, 25)*	0.0	0.0	0.0	0	0
Municipal (24)	0.4	3.6	0.0	61	12,222
Unmetered (999)	0.0	0.0	0.0	0	0
Total	24.6	209.2	3.0	4,242	675,145

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.

Residential Efficient Product Rebates includes the Appliance Retirement and Instant Savings program components. Appliance Retirement includes appliance replacements delivered through the HomeWarming service.

*The Appliance Retirement program component collects eligible residential appliances from BNI participants (e.g., rental apartment buildings, condominium buildings, non-profits, and universities on commercial rate codes), in addition to residential participants.

Residential EPR achieved higher-than-anticipated net incremental energy and net peak demand savings in 2018, as compared to the mid-course adjusted planned savings. This is primarily attributed to the Instant Savings program component, which saw more successful spring and fall campaigns than expected. Please see below for further discussion on Instant Savings.

The Residential EPR unit cost for 2018 was 22 percent lower than the annual planned mid-course adjusted unit cost, thus contributing to better-than-anticipated value for ratepayers, and was primarily influenced by an increase in the number of products with a lower unit cost sold during the Instant Savings campaigns.⁹ This includes multi-pack sales, which have a lower per-kWh rebate amount than the corresponding single packs of qualifying measures.

⁹ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

Instant Savings

Instant Savings provides point-of-sale discounts to retail customers. In 2018, Instant Savings achieved 21.9 GWh of net incremental energy savings and 2.6 MW of net peak demand savings through the sale of over 669,500 energy-efficient products, the majority of which were ENERGY STAR® certified LED lighting products.

Instant Savings contributed the bulk of the energy savings in the Residential EPR program, the majority of which are attributed to the spring and fall Instant Savings campaigns, which took place from April 6 to May 20, 2018, and September 28 to November 10, 2018, respectively. Each campaign had a corresponding marketing campaign including digital media, radio, TV, and in-store advertising efforts.

In 2018, following the pilot of a new Indoor Air Quality category in 2017, ENERGY STAR® certified air purifiers and dehumidifiers were added to the existing Instant Savings measures offered to consumers.

Appliance Retirement

In 2018, the Appliance Retirement program component of Residential EPR achieved net incremental energy savings of 2.7 GWh and 0.4 MW of net peak demand savings. These savings were achieved through the retirement of 5,595 inefficient appliances. Of the total number of appliances retired, 320 appliances were replaced with energy-efficient models through the HomeWarming service.¹⁰

¹⁰ HomeWarming provides low-income homeowners with a service that includes energy assessments and significant energy-saving home upgrades. EfficiencyOne receives funding from the Province of Nova Scotia to administer this program for non-electrically heated homes. Costs for appliance replacements in non-electrically heated homes are paid for by DSM funds.

EfficiencyOne launched the Appliance Retirement online booking portal in Q1 of 2018, as well as a new virtual call centre, designed to improve the user experience and streamline the pick-up process.

Marketing efforts for Appliance Retirement in 2018 included social and digital media campaigns as well as radio, billboard and direct-mail advertising. EfficiencyOne also undertook a targeted email campaign in the fall of 2018, which utilized NS Power customer data to identify potential Appliance Retirement participants. For further information on EfficiencyOne's use of NS Power customer data, please refer to section 1.5.2.

1.2.2 Existing Residential

The Existing Residential program achieved net incremental energy savings of 22.7 GWh and 7.1 MW of net peak demand savings in 2018, as compared to the mid-course adjusted planned savings amounts of 28.5 GWh and 8.0 MW, respectively. Existing Residential comprises the following program components:

- Home Energy Assessment (HEA);
- Green Heat;
- Efficient Product Installation (EPI); and
- First Nations Home Energy Efficiency pilot.

A breakdown of 2018 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the Existing Residential program is presented in Table 5, below.

Table 5: Existing Residential Rate Class Results

	Existing Residential - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Housing Units (#)*
Residential/Charitable (2,3,4)	22.3	293.0	7.0	6,291	14,049
Small General (10)	0.0	0.0	0.0	2	3
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.4	5.7	0.1	112	269
Unmetered (999)	0.0	0.0	0.0	0	0
Total	22.7	298.8	7.1	6,405	14,322

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.

Existing Residential includes the Home Energy Assessment, Green Heat, Efficient Product Installation, and First Nations Home Energy Efficiency pilot program components.

The Home Energy Assessment program component is mainly comprised of homes heated by electricity. However, some participation includes homes heated primarily by non-electric fuels. As participating homes heated primarily by non-electric fuels generate a small amount of electricity savings, they receive a small amount of DSM funding and are counted here.

*Includes apartments.

EPI was the primary contributor to the shortfall from the Existing Residential mid-course adjusted planned net incremental energy and net peak demand savings, with some additional impact from HEA; please see the corresponding EPI and HEA sections below for more detail.

Lower-than-expected participation in EPI and HEA also affected the annual expenditures for Existing Residential, which were lower than anticipated as compared to the 2018 planned mid-course adjusted amount. This is a result of the reduction in the number of measures installed through EPI, as well as a reduction in the number of assessments taking place (which have an associated cost) and less rebates issued in HEA.

Home Energy Assessment

HEA achieved net incremental energy savings of 5.7 GWh and net peak demand savings of 1.6 MW, with 791 participants completing upgrades and receiving rebates in 2018.

HEA's results were impacted by a lower-than-anticipated number of project completions in 2018. This is attributed to industry capacity issues resulting from increased demand for home assessments in 2018.¹¹ Many EfficiencyOne Service Organizations worked to increase their number of Energy Advisors in order to meet this increased demand and EfficiencyOne continued to work with its Service Organizations during the year to determine how best to mitigate this issue. Efforts included EfficiencyOne hosting a two-day Natural Resources Canada (NRCAN) exam preparation course in November of 2018, in order to prepare prospective Energy Advisors for their exams and help facilitate an increase in industry capacity. EfficiencyOne continues to liaise with NRCAN regarding this issue.

HEA also saw the continuation of the EnerGuide Real Estate Listing pilot in 2018, in partnership with the federal and Nova Scotia provincial governments, the Nova Scotia Realtors Association, and ViewPoint Realty Services. The innovative pilot gives homeowners the option to have EnerGuide information included with their home listing on the ViewPoint.ca real estate website.

In Q3 of 2018, EfficiencyOne implemented changes to the HEA incentive structure and rebate guide in order to make them more user-friendly for participants, while maintaining all the same measures and eligibility criteria. In addition, the HEA rebate structure for heat pumps was updated to reflect that of Green Heat, which offers rebates in dollars per ton of installed capacity.

¹¹ Demand increased for home assessments in non-electrically heated homes following the launch of the federally-funded HEA program on July 10, 2018.

1 Marketing efforts for HEA in 2018 included billboard, TV, digital, and social media
2 advertising.

3 4 **Green Heat**

5
6 Green Heat achieved net incremental energy savings of 4.2 GWh and net peak
7 demand savings of 4.0 MW in 2018. Green Heat saw 3,055 measures installed in 2018,
8 which represents the largest number in its history, and a significant increase in
9 participation as compared to 2017. These results are accredited to the strong
10 performance of high-efficiency ductless mini-split heat pumps (MSHPs), which were
11 added to Green Heat in late-2015. MSHPs accounted for 92 percent of the total
12 measures installed in Green Heat in 2018. Additional increases in participation in 2018
13 are attributed to: the new rebate structure introduced in Q3 of 2017, when the
14 requirement for pre-approval prior to purchasing eligible equipment was removed;
15 marketing efforts; and warmer weather than usual during the summer of 2018.

16
17 On July 10, 2018, EfficiencyOne discontinued using DSM funds to support Green Heat
18 rebates introduced on August 1, 2017, for homes that are not primarily electrically
19 heated, where the owner had already made a decision to purchase a heat pump. For
20 these homes, EfficiencyOne claimed the associated incremental energy savings
21 between the high-efficiency heat pump and the standard heat pump the customer
22 would have otherwise purchased. Moving forward, rebates for homes not primarily
23 electrically heated will be funded by the federal government, via the Province of Nova
24 Scotia with associated energy savings claimed towards provincial targets.

25
26 Marketing activities in 2018 for Green Heat included social and digital media efforts,
27 and radio advertising.

Efficient Product Installation¹²

The majority of the 2018 Existing Residential savings are attributed to the EPI program component, which achieved 12.8 GWh of net incremental energy savings and 1.5 MW of net peak demand savings in 2018. Partner organizations installed over 274,000 energy-efficient products in over 10,800 residences across Nova Scotia.

EPI saw lower-than-anticipated net incremental energy savings in 2018 due to fewer-than-anticipated participants, which is demonstrated in the trend of declining participation observed in recent years.¹³ In addition, EPI observed fewer installation opportunities per home resulting in lower average energy savings per home in 2018.

In an effort to increase participation levels, EPI offered seasonal promotions during 2018, in conjunction with standard upgrades, as follows:

- a clothesline was issued to all participants who signed up between July and November of 2018, with 3,246 being distributed; and
- participants were offered a set of LED holiday lights in February of 2018, and again from October to December of 2018, in exchange for two sets of traditional incandescent lights, with a limit of two sets of LED lights per household. A total of 636 sets of holiday lights were exchanged in EPI participants' homes.

EPI also diversified its product offerings in 2018 by including thermostatic shower valves and additional non-A type lamps to the list of eligible products.

¹² EPI consists of the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components within the Existing Residential program. These two components merged on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia. The program component name was changed to EPI to more accurately reflect the service offered.

¹³ Existing Residential Program, *2018 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 15 March 2019, at p. 66.

In addition to the above-noted seasonal promotions, EPI marketing efforts included social media campaigns and digital display efforts. EfficiencyOne also undertook a targeted email campaign in fall of 2018, which utilized NS Power customer data to identify potential EPI participants. For further information on EfficiencyOne's use of NS Power customer data, please refer to section 1.5.2.

First Nations Home Energy Efficiency Pilot

This pilot seeks to deliver significant energy savings to on-reserve, Band-owned homes, where the intent is to increase electricity savings primarily through building envelope and efficient HVAC upgrades in these communities. In 2018, initial home assessments and the associated recommended upgrades began. The project completions anticipated in late Q4 of 2018 are now expected in early 2019, with the associated energy savings being claimed at that time. As a result, no savings were claimed for this pilot in 2018.

1.2.3 New Residential

In 2018, the New Residential program, marketed as New Home Construction (NHC), achieved 4.5 GWh of net incremental energy savings and 1.3 MW of net peak demand savings as compared to the mid-course adjusted planned savings of 4.6 GWh and 1.3 MW, respectively.

A breakdown of 2018 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the New Residential program is presented in Table 6, below.

Table 6: New Residential Rate Class Results

	New Residential - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Participants (#)
Residential/Charitable (2,3,4)	4.5	134.7	1.3	2,375	647
Small General (10)	0.0	0.0	0.0	0	0
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.0	0.9	0.0	19	5
Unmetered (999)	0.0	0.0	0.0	0	0
Total	4.5	135.7	1.3	2,394	652

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals. New Residential includes the New Home Construction program component.

NHC saw 652 project completions in 2018, representing an increase as compared to the prior three years. This includes seven project completions within the Passive House pilot, which launched in October of 2016. The pilot saw 13 project completions in total and has now concluded.

NHC saw an increase in expenditures in 2018, as compared to the planned annual mid-course adjusted amount, as a result of:

- a higher-than-anticipated number of registrations during the year;
- more rebates issued than anticipated; and
- a higher average rebate per participant in 2018 than expected.

In addition, the NHC unit cost for 2018 was 20 percent higher as compared to the annual mid-course adjusted unit cost.¹⁴ This is primarily a result of:

¹⁴ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

- the expenditures incurred from the additional registrations in 2018, where the corresponding energy savings are not claimed until projects are completed, frequently in the subsequent program year;
- a higher-than-anticipated number of completed projects qualifying for a rebate; and
- a higher-than-anticipated number of projects completing in 2018 that were assessed under a prior incentive structure and ERS, resulting in a higher unit cost for those projects.

On December 3, 2018, NHC launched a new incentive structure with the intent of increasing the number of high-performance homes in Nova Scotia. The most significant change is the addition of a third tier to the existing rebate structure with participants now eligible to receive a \$7,000 rebate, along with an additional \$1,000 from the Province of Nova Scotia to offset design costs, if a home's energy performance is 65-75 percent better than the code-built equivalent, or meets Canadian Home Builders' Association (CHBA) NetZero or Passive House standards.

NHC marketing activities in 2018 included billboard, digital, print and social media efforts. NHC also made changes to application forms in order to improve process efficiencies and reduce project duration times.

1.3 Business, Non-Profit and Institutional Sector Results

The BNI sector achieved net energy savings of 99.6 GWh and 14.2 MW of net peak demand savings in 2018, compared to its mid-course adjusted planned savings of 86.0 GWh and 14.1 MW, respectively. The BNI sector comprises the following programs:

- BNI Efficient Product Rebates;
- Custom Incentives; and
- Direct Installation.

For BNI programs, EfficiencyOne continued its On-site Energy Manager (OEM) partnership initiative in 2018. Under this initiative, EfficiencyOne places an energy manager within a large organization to identify new energy-efficiency projects and to

support the organization in advancing these projects. OEM services are paid for by the organization, in part through a recovery on project incentives. In 2018, five new OEM partnerships began, bringing the total number of placements at the end of the year to ten.¹⁵ DSM savings from the OEM service are claimed within the three BNI programs listed above.

Marketing efforts spanning the BNI sector in 2018 were targeted towards the following participant groups:

- Industrial;
- Agriculture;
- Small Businesses;
- Hospitality;
- Commercial Buildings; and
- Municipalities.

The above participant groups represent large markets with significant energy savings potential.

Marketing activities in 2018 related to the above-listed participant groups included:

- the development of BNI success story videos and BNI-focused content on the ENS website;
- the creation of rack cards for EfficiencyOne partners to highlight benefits and offerings for the Direct Installation program, marketed as Small Business Energy Solutions (SBES);
- hosting of events across Nova Scotia to build awareness of BNI program offerings, including several events related to Small Business Week;
- the release of BNI newsletters;
- attending a variety of industry conferences and trade-shows spanning multiple participant groups; and

¹⁵ Some of these placements are funded wholly or in part by the Province of Nova Scotia.

- the development of marketing campaigns designed to raise awareness of offerings to specific participant groups.

1.3.1 BNI Efficient Product Rebates

BNI Efficient Product Rebates (EPR), marketed as Business Energy Rebates (BER), achieved net incremental energy savings in 2018 of 75.3 GWh in 2018 and 11.3 MW of net peak demand savings, compared to the mid-course adjusted planned savings of 50.6 GWh and 7.9 MW, respectively.

A breakdown of 2018 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the BNI EPR program is presented in Table 7, below.

Table 7: BNI EPR Rate Class Results

	BNI Efficient Product Rebates - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)*	4.2	49.2	0.7	507	31,090
Small General (10)	9.4	102.1	1.4	1,112	78,846
General Demand (11)	40.6	456.9	6.3	4,978	359,120
Large General (12)	5.9	70.8	0.8	587	45,221
Small Industrial (21)	4.3	44.6	0.6	524	35,720
Medium Industrial (22)	3.4	37.9	0.5	376	26,534
Large Industrial (23, 25)	5.7	67.5	0.7	692	35,625
Municipal (24)	1.9	23.0	0.3	243	14,184
Unmetered (999)	0.0	0.0	0.0	0	0
Total	75.3	852.1	11.3	9,017	626,341

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end results.

BNI Efficient Product Rebates includes the BER program component.

*EPR (BNI) includes some residential customers as eligible participants (e.g., farms, community groups on charitable rate codes, rental apartment buildings, and condominium buildings).

BER achieved its highest energy savings levels in the program's history through the sale of over 626,000 energy-efficient products through the Instant Rebates and Mail-In services. The Instant Rebates service observed continued growth and increased participation in 2018 as compared to recent years, and accounts for the majority of the

savings for the year. The number of Mail-In projects also increased in 2018, compared to the relatively stable project levels observed in recent years.

BER's stronger-than-expected performance in 2018 is attributed to repeat participants, distributor performance and business development activities. BER's expenditures for 2018 were higher as compared to the mid-course adjusted planned expenditures as a result of BER's strong performance. BER also saw a reduction in the unit cost of 22 percent in 2018, as compared to the annual mid-course adjusted unit cost, as a result of participants purchasing a higher volume of measures with lower rebates, such as energy-efficient LED indoor lighting products.¹⁶

1.3.2 Custom Incentives

The Custom Incentives program achieved net incremental energy savings of 14.7 GWh and 1.4 MW of net peak demand savings in 2018, as compared to the mid-course adjusted planned savings amounts of 25.8 GWh and 4.5 MW, respectively. Custom Incentives comprises the following program components:

- Custom;
- Energy Management Information Systems (EMIS); and
- Strategic Energy Management (SEM).

In 2018, Custom Incentives supported innovative projects by offering technical assistance, financial incentives, and project financing to participants to aid in the reduction of their electricity consumption and demand.

A breakdown of 2018 net incremental energy and net peak demand savings, expenditures, and participation by rate class for Custom Incentives is presented in Table 8, below.

¹⁶ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

Table 8: Custom Incentives Rate Class Results

	Custom Incentives - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Projects (#)
Residential/Charitable (2,3,4)*	0.1	0.7	0.0	21	1
Small General (10)	0.1	1.8	0.0	45	2
General Demand (11)	5.9	75.0	0.7	1,913	31
Large General (12)	2.2	29.4	0.1	640	16
Small Industrial (21)	1.0	13.6	0.1	320	8
Medium Industrial (22)	2.5	20.5	0.2	652	13
Large Industrial (23, 25)	2.0	10.5	0.1	374	10
Municipal (24)	0.9	12.7	0.1	262	4
Unmetered (999)	0.0	0.0	0.0	0	0
Total	14.7	164.1	1.4	4,228	85

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals.

Custom Incentives includes the Custom, EMIS, and SEM program components. EMIS and SEM participants are each counted once, but their participation is ongoing throughout the year.

*Custom Incentives includes some residential customers as eligible participants (e.g., farms, community groups on charitable rate codes, rental apartment buildings, rental apartment buildings, and condominium buildings).

Custom Incentives fell short of its 2018 planned net incremental energy and net peak demand savings as a result of lower-than-anticipated savings in the Custom program component.

In addition, Custom Incentives expenditures in 2018 were lower-than-anticipated, as compared to the mid-course adjusted planned expenditures, and were also primarily influenced by the Custom program component. The 2018 unit cost for Custom Incentives was 45 percent higher than the annual planned mid-course adjusted unit cost. This is also attributed to the Custom program component performance.

Please refer to the Custom program component discussion below for further information on these results.

Custom

The Custom program component of the Custom Incentives program generated 11.6 GWh of net incremental energy savings and 1.2 MW of net peak demand savings in 2018 from 69 projects.

The Custom program component comprises three separate services: Retrofit; Building Optimization; and New Construction. These services saw 119, 20 and 23 projects initiated in 2018, respectively.

The Retrofit service claimed savings from 68 projects in 2018, accounting for the majority of savings achieved through the Custom program component, with a diverse array of projects covering a range of energy efficiency measures including:

- heating;
- ventilation and air conditioning controls;
- motors and drives;
- compressed air; and
- refrigeration.

In 2018, six projects generated savings in the Building Optimization service through the implementation of no-cost or low-cost energy-efficiency measures identified through a recommissioning process.

The New Construction service achieved savings from five projects in 2018. This service encourages participants to make decisions that are informed by their anticipated operating costs, and offers technical support and incentives resulting in electricity savings in new BNI buildings, as well as major renovations to existing buildings.

The Custom program component also saw the continuation of five pilots in 2018, as follows:

- offering participants incentives to repair compressed air leaks identified through a leakage audit;

- providing participants with a compressed air flow meter to quickly identify when their air leakage rate has increased;
- providing a refrigeration optimization audit to industrial and commercial participants with the goal of identifying potential improvements for their system;
- providing a service incenting high-quality commissioning of new commercial buildings; and
- investigating the viability of building envelope air leakage repairs in commercial buildings.

Most of the above-noted pilots were completed in 2018 or are expected to complete in 2019. Analysis of the results is ongoing and EfficiencyOne will evaluate their effectiveness and whether they will be incorporated into Custom to enhance energy savings for participants.

Custom saw fewer-than-anticipated project completions as well as lower-than-expected net incremental energy savings per participant in 2018. A number of Custom projects expected to complete in 2018 were affected by project-specific timeline delays; these projects are now expected to complete in 2019 as a result. This contributed to the shortfall in the energy savings for Custom Incentives, as compared to the planned savings for 2018, as did savings adjustments resulting from the evaluation process. Expenditures for Custom Incentives in 2018 were also lower-than-anticipated, as compared to the mid-course adjusted planned expenditures, due to less Custom incentives being issued in the year.

The unit cost for Custom Incentives was impacted by the performance of the Custom program component in 2018 and was higher than the mid-course adjusted unit course. This is primarily attributed to lower-than-anticipated savings in the Custom program component as previously discussed, where the evaluation resulted in a decrease to the

Custom program component savings; please refer to the 2018 Custom Incentives Evaluation Report for further information.¹⁷

Energy Management Information Systems

EMIS achieved net incremental energy savings of 1.6 GWh and net peak demand savings of 0.1 MW in 2018, generated by two participants.

EMIS aims to help industrial and institutional participants use energy consumption data from metered systems to inform their process decisions. This involves helping participants conduct an EMIS audit, develop an EMIS implementation plan, and implement the EMIS plan (involving the installation and configuration of metering and monitoring equipment, and training and organizational support).

In 2018, the EMIS program component worked with participants to support them and further refine their EMIS to achieve energy savings where possible, and continued recruitment efforts for the program component. EMIS also continued work during 2018 on a pilot for fault detection software in a healthcare facility.

Strategic Energy Management

SEM achieved net incremental energy savings of 1.5 GWh and net peak demand savings of 0.2 MW in 2018 generated from four participants.

SEM focuses on operational and procedural changes that companies can make to reduce their energy usage. This is done by establishing energy teams within participating organizations and developing strategic energy management plans that include:

- facilitated workshops for energy team members;

¹⁷ Custom Incentives Program, *2018 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 15 March 2019, at p. 36

- energy assessments;
- energy mapping and monitoring;
- tracking and reporting; and
- employee engagement activities.

During 2018, SEM activities continued to focus on supporting participants as well as recruitment efforts.

1.3.3 Direct Installation

The Direct Installation program, marketed as Small Energy Business Solutions (SBES), achieved net incremental energy savings of 9.6 GWh and net peak demand savings of 1.4 MW in 2018, as compared to the planned mid-course adjusted savings of 9.6 GWh and 1.7 MW, respectively.

A breakdown of 2018 net incremental energy and net peak demand savings, expenditures, and participation by rate class for SBES is presented in Table 9, below.

Table 9: Direct Installation Rate Class Results

	BNI Direct Installation - 2018				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Projects (#)
Residential/Charitable (2,3,4)	1.0	10.8	0.2	483	59
Small General (10)	1.6	19.8	0.3	840	146
General Demand (11)	6.5	81.6	0.9	2,821	300
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.4	5.0	0.1	183	11
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.1	1.6	0.0	58	13
Unmetered (999)	0.0	0.0	0.0	0	0
Total	9.6	118.8	1.4	4,386	529

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited. Savings and expenditures reported in previous quarters may have been updated and are reflected in the year-end totals. Direct Installation includes the Small Business Energy Solutions program component.

1 During 2018, SBES continued to enable participants to find contractors through the
2 ETN or use a contractor of their choosing, resulting in 529 project completions,
3 representing an increase over 2017 and demonstrating an upward trend in
4 participation since 2016. This same trend of year-to-year growth was also observed in
5 SBES's energy savings results.

6
7 While SBES achieved its planned net incremental energy savings in 2018, it saw lower-
8 than-expected net peak demand savings, as a result of adjustments made to tracked
9 peak demand savings through the evaluation process; please refer to the 2018 Direct
10 Installation Evaluation Report for further information.¹⁸

11
12 In 2018, the SBES Affordable Multifamily Housing Pilot continued. This pilot was
13 launched in 2016 and provided energy audits and energy-efficient upgrade
14 recommendations to participants. In Q3 of 2018, following consultation and
15 engagement with participants and relevant stakeholders to identify barriers to
16 participants implementing the energy-efficient upgrade opportunities identified during
17 the audit phase, EfficiencyOne revised the pilot incentive structure and re-engaged
18 with audit participants. In addition, eligibility requirements were adjusted to permit
19 housing co-ops to participate. These changes resulted in three additional audits and
20 four project completions in Q4 of 2018. Since the pilot began in 2016, there have been
21 15 project completions in total. Following the recent revisions to the incentive
22 structure, EfficiencyOne has continued to liaise with stakeholder organizations in order
23 to assist with current and future participant engagement.

¹⁸ Direct Installation Program, *2018 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 15 March 2019, at p. 20

1.4 Low-Income Highlights

Within the Residential and BNI results highlighted in Table 1, EfficiencyOne supported the following work for low-income Nova Scotians in 2018 (based on direct information where provided or demographic data):

- 3,947 low-income Nova Scotians received free installation of low-cost energy efficiency measures through the Efficient Product Installation program component;
- 393 low-income participants received rebates to replace or retire old, inefficient appliances;
- 25,017 units were sold or replaced through the Residential and BNI Efficient Product Rebates programs, via the Residential Instant Savings program component and the BNI Business Energy Rebates (Instant Rebates service) program component; and
- 73 apartment buildings received rebates through BNI programs, resulting in energy savings for the low-income Nova Scotians who live in those buildings.

Incidental Low-Income Impacts

In addition to HomeWarming and the SBES Affordable Multifamily Housing Pilot, which are dedicated offerings for low-income Nova Scotians, EfficiencyOne generates incidental low-income impacts through programs that are not specifically targeted at this segment. For example, a portion of efficient product installations are performed in low-income households. EfficiencyOne has used a variety of methods, where appropriate on a program-by-program basis, to estimate the proportion of low-income energy savings, program costs, and participation in these programs, which are presented in Table 10, below.

Table 10: 2018 Low-Income Results

Low-Income Participation (2018)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ million)	Participation (#)	Participation Unit
Residential Programs						
Efficient Product Rebates	0.7	4.3	0.1	0.3		
Instant Savings ¹	0.3	2.6	0.0	0.0	4,220	Units rebated
Appliance Retirement ^{1,2}	0.4	1.7	0.1	0.3	393	Units rebated
Existing Residential	4.6	38.6	0.6	1.0		
Home Energy Assessments ³	-	-	-	-	-	
Green Heating Systems ³	-	-	-	-	-	
Efficient Product Installation Service	4.6	38.6	0.6	0.9	3,947	Housing units
First Nations Home Energy Efficiency Pilot	0.0	0.0	0.0	0.1	0	Housing units
New Residential	0.0	0.0	0.0	0.0		
New Home Construction ³	-	-	-	-	-	
Residential Subtotal⁹	5.3	42.9	0.7	1.3	8,561	
BNI Programs						
Efficient Product Rebates	2.8	33.6	0.5	0.2		
Business Energy Rebates - Mail-In ^{6,7}	0.6	5.8	0.1	0.1	52	Buildings retrofitted
Business Energy Rebates - Instant ^{6,8}	2.3	27.8	0.4	0.2	20,797	Units rebated
Custom Incentives	0.4	5.5	0.1	0.2		
Custom ^{6,7}	0.4	5.5	0.1	0.2	14	Buildings retrofitted
Energy Management Information Systems ³	-	-	-	-	-	
Strategic Energy Management ³	-	-	-	-	-	
Direct Installation	0.4	5.0	0.1	0.2		
Small Business Energy Solutions ^{6,7}	0.4	5.0	0.1	0.2	7	Buildings retrofitted
BNI Subtotal⁹	3.7	44.1	0.8	0.6	20,870	
Programs Total⁹	8.9	87.0	1.4	2.0	29,431	

Includes estimates of low-income participation in program components where income is not disclosed. Estimates reported in previous quarters may have been updated and are reflected in the annual totals. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover, and are evaluated and pending verification. Expenditure amounts are unaudited.

¹ Low-income Nova Scotians are assumed to be 10 percent as likely to participate as the general population; this assumption may be revised in the future as EfficiencyOne further refines its methodology for calculating low-income participation rates relative to the general population.

² Includes appliance replacements delivered through the HomeWarming service.

³ Participation by low-income Nova Scotians is assumed to be zero.

⁴ Income disclosure is optional for program participation. Low-income participants are tracked where income information is available; otherwise low-income Nova Scotians are assumed to participate in proportion to the general population within each county.

⁵ Includes projects through Housing Nova Scotia (HNS); for non-HNS projects, the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

⁶ Although the program participants are building owners, the avoided energy benefits are assumed to flow through to tenants; the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

⁷ Participation numbers are totals that include varying proportions of low-income and non low-income tenants. Expenditure and savings are estimated for the low-income portion.

⁸ The exact installation location of products receiving Business Energy Rebates (BER) Instant Rebates is unknown. The proportion of BER Instant Rebates measures installed in apartments is assumed to be the same as the proportion of BER Mail-In Rebates installed in apartments.

⁹ Participant Total contains mixed units, i.e. the sum of all participants listed by program component.

1.5 Enabling Strategies

Enabling Strategies played a strong role in enabling energy-efficiency services and programs to continue achieving savings in 2018. Enabling Strategies indirectly facilitate future savings within programs and have three key objectives:

- increase awareness of, and education about, DSM programs and services, which is key to driving participation in energy-efficiency activities;
- evolve DSM services through innovation and improve delivery of these services to Nova Scotians; and
- drive market transformation.

2018 Enabling Strategies categories included:

- Education and Outreach;
- Development and Research; and
- Other Enabling Strategies.

1.5.1 Education and Outreach

Education and Outreach strategies in 2018 focused on encouraging participation in DSM programs by increasing Nova Scotians' awareness of the value of energy efficiency.

Engagement and reach across all social media platforms remained strong in 2018 with ENS achieving increases in its Instagram, Twitter and LinkedIn followers, as well as Facebook "likes", as compared to 2017. In addition, there were more than 160 media mentions during 2018, representing an increase over 2017.¹⁹

In 2018, ENS continued its Green Schools program, an initiative to enhance environmental sustainability at schools, with over 290 schools now taking part, which represents over two-thirds of all schools in Nova Scotia. Five engagement officers worked to support and provide resources to teachers and Green Team leaders with the goal of enhancing environmental sustainability at schools. Green Schools Nova Scotia also participated in a variety of community events, presentations and initiatives during 2018, including:

¹⁹ Includes references to both ENS and EfficiencyOne.

- over 1,000 in-school or virtual engagements, reaching almost 20,000 students and teachers;
- hosting of the Environmental Education Professional Development Day for the Atlantic Science Teachers chapter on October 26, 2018;
- participation in Earth Day, World Oceans Day, and other community-based engagement activities and events; and
- engaging with education stakeholders and partners in order to increase accessibility of information for teachers and to help support and promote resources to teachers.

Partnerships with Nova Scotia's leading post-secondary institutions help foster a culture of efficiency in Nova Scotia and educate tomorrow's workforce on the benefits of efficiency for our economy and environment. In 2018, EfficiencyOne continued to sponsor courses in energy efficiency and renewable energy at Saint Mary's University and Dalhousie University. The objective of these interdisciplinary courses is to build capacity in Nova Scotia's renewable energy and energy-efficiency sectors, demonstrate models available to deliver energy-efficiency programs, profile careers in the industry, and encourage development in sustainable energy. EfficiencyOne also partnered with the Nova Scotia Community College (NSCC) to award a \$1,500 bursary, called the Efficiency Nova Scotia Bright Student Award, to a student enrolled in the Energy Sustainability Engineering Technology program.

EfficiencyOne hosted its Bright Business Conference again in 2018. The conference was well attended, with 270 participants, the highest attendance to date, and provided professional development with various breakout sessions throughout the day to encourage businesses to incorporate energy efficiency into their operations. Businesses from across the province won energy-efficiency awards in five categories.

Additional 2018 Education and Outreach initiatives and activities included:

- connecting with Nova Scotians at a variety of information sessions, events, workshops, home shows and trade shows across the province to highlight residential and BNI program offerings to increase energy-efficiency literacy;

- visiting 26 communities across Nova Scotia as part of ENS's Summer Tour program;
- presenting to a variety of Nova Scotian community groups, businesses and colleges;
- program-specific marketing efforts (as detailed within the respective program sections of this report);
- releasing the 2017 EfficiencyOne Annual Report (distinct from the ENS Annual Progress Report) on May 10, 2018;
- releasing *The Switch* Residential monthly e-newsletter and *The Switch* BNI bi-monthly e-newsletter and *Network News* bi-monthly newsletter; and
- distributing the *Efficiency Connection* newsletter to local elected leaders, including MLAs and MPs within the Province of Nova Scotia.

1.5.2 Development and Research

Development and research activities in 2018 included recurring research to track quality assurance, participant satisfaction, and other attitudinal metrics among the general population of Nova Scotia households, to help EfficiencyOne respond to changing market conditions. This research indicated that ENS's influence on helping households reduce their energy consumption remained high at 30 percent in 2018. Quality assurance and participant satisfaction surveys were also completed for applicable program components as well as participant research undertaken to understand and improve the experience at each stage of the participant journey.

In addition, EfficiencyOne conducted incentive-level research in accordance with the Incentive Setting Implementation report, and reviewed and considered the Evaluation Consultant's recommendations regarding the implementation of the incentive setting methodology.²⁰

²⁰ M08604, *Nova Scotia 2017 Program Support Process Evaluation Reports: Practices and Procedures Volume 1: Incentive Setting* [29 March 2018].

1 In Q1 of 2018, EfficiencyOne began receiving NS Power customer usage data, following
2 the NSUARB's decision on November 15, 2017, to approve EfficiencyOne's application
3 to obtain certain elements of NS Power's customer usage data.²¹ EfficiencyOne
4 conducted a phased integration of this new data into its existing processes, with
5 privacy and confidentiality being of paramount importance. EfficiencyOne used the
6 historical data to facilitate direct marketing of EfficiencyOne programs and services to
7 Nova Scotians and to more effectively identify potential program participants based
8 on multi-year consumption trends. Specific activities and impacts in 2018 related to NS
9 Power customer usage data included:

- 10 • focused email campaigns for EPI and Appliance Retirement, each of which
11 achieved notably higher open rates than their respective industry average.
12 Increases in visits to the relevant ENS website pages were also noted following
13 the campaigns;
- 14 • development of a predictive model to identify NS Power customers who are
15 most likely suited to HEA for electrically heated homes;
- 16 • geo-targeting to promote EfficiencyOne small business events;
- 17 • energy usage profiling of Residential and BNI customers to inform marketing
18 initiatives;
- 19 • use of advanced analytics to identify heating type, based on seasonal usage, to
20 target specific EfficiencyOne service offerings based on heat type; and
- 21 • quicker eligibility screening times and a reduction in application processing
22 times for SBES and the Custom program component of Custom Incentives.

23
24 NS Power customers can opt-out of receiving targeted DSM promotional materials
25 from ENS. In EfficiencyOne's Reply Submissions on its Application for Data (M08113),
26 EfficiencyOne proposed that for the year following the initial transfer of data from NS
27 Power (January 2018), it would update the Board via its quarterly reports to advise of

²¹ M08113, NSUARB Decision, *The Public Utilities Act and An Application by EfficiencyOne for determination that Nova Scotia Power Inc. is required to provide EfficiencyOne, pursuant to Section 79K of the Public Utilities Act, RSNS 1989, C. 380, as amended, with Names and Emails and Customer Usage Data on a monthly basis* [17 November 2017], 2017 NSUARB 174 (NSUARB).

the number of opt-outs received as a result of the Application. Since the initial transfer of data from NS Power to EfficiencyOne, the total number of NS Power customers who had requested to be placed on ENS's "do not contact" list was 431 as at the end of 2018. This number equates to a 0.3 percent opt-out rate and includes customers who have opted to unsubscribe from emails sent during the targeted marketing campaigns in Q3 for EPI and Appliance Retirement, as detailed above, as well as those who have opted out of receiving communications from ENS via the ENS website opt-out tool.

1.5.3 Other Enabling Strategies

Other Enabling Strategies included the following sub-categories in 2018:

- PACE Financing;
- Capacity Building;
- Working with Governments; and
- Regulatory Affairs.

PACE Financing

EfficiencyOne recognizes that a lack of access to capital can be a barrier to potential participants adopting energy-efficiency measures. EfficiencyOne strives to offer innovative financing options to help compensate for this barrier and to increase participation in DSM programs. In EfficiencyOne's experience, financing programs complement, but do not replace, traditional rebate programs.

Property Assessed Clean Energy (PACE) programs enable participants to pay for energy-efficiency upgrades through an add-on to their municipal account (a Local Improvement Charge). Although the PACE financing program is funded through the participating municipality and the Province of Nova Scotia, and therefore outside of DSM programs, it enables DSM work by providing Existing Residential participants with an additional financing option.

1 In 2018, EfficiencyOne administered PACE programs for two municipalities and their
2 residents. In total, eight municipalities offered PACE financing to homeowners for
3 energy-efficiency measures, and EfficiencyOne continues to support these electrically
4 heated PACE participants with standard HEA rebates.

5 6 **Capacity Building**

7
8 2018 saw EfficiencyOne continue to support and grow the energy-efficiency industry
9 in Nova Scotia through its ETN, the goal of which is to develop a network that will,
10 through education and engagement:

- 11 • drive energy savings and increase participation in EfficiencyOne services;
- 12 • build industry capacity for energy-efficiency work in Nova Scotia; and
- 13 • deliver demonstrable value to its members.

14
15 EfficiencyOne continued to strengthen its relationship with industry stakeholders
16 throughout 2018 and build on momentum gained through efforts undertaken in prior
17 years. Activities undertaken in 2018 included:

- 18 • hosting, sponsoring and assisting in organizing training and events, and by
19 offering exclusive discounts to ETN members who attended;
- 20 • hosting an event that offered ETN members the opportunity to connect and
21 network with developers and property managers;
- 22 • the creation of marketing guidelines to assist ETN members in accurately
23 referencing EfficiencyOne services and incentives in their business marketing
24 materials;
- 25 • EfficiencyOne's Bright Business Conference which took place on October 16,
26 2018;
- 27 • the distribution of six issues of *The Network News*, the ETN's bi-monthly
28 newsletter that highlights updates on programs, pilots, procurement
29 opportunities, helpful tips, training, events, and more.

Working with Governments

EfficiencyOne works with governments to advance the introduction of energy-efficient products and technologies, through assisting in the creation of effective regulations designed to save Nova Scotians money, and decrease the environmental effects of energy use.

In 2018, EfficiencyOne supported the ongoing development of Canadian energy efficiency standards by:

- participating in the Canadian Standards Association's Steering Committee on Performance Energy Efficiency and Renewables (SCOPEER) and the Strategic Resource Task Force (SRTF) committee;
- continuing to facilitate the evaluation of impacts relating to code and regulation changes on an annual basis;
- providing provincial and federal governments with general technical support and market insights, in an effort to support the continued development of energy efficiency-related standards products, codes and regulations.

The ongoing development of energy efficiency codes, standards and regulations serves to ensure continued progress relating to the transformation of markets for energy-consuming products and technologies, toward higher-performing, more energy-efficient product types. These changes ensure end-users have access to energy-efficient products and equipment, with the associated cost savings and decreased environmental impact, relative to existing products.

Regulatory Affairs

Regulatory Affairs activities enable EfficiencyOne to meet its regulatory requirements and provide a fair and transparent process for stakeholders and Nova Scotians to offer input into DSM Resource Plans, programs, and investments.

In 2018, Regulatory Affairs activities included:

- engaging with regulatory stakeholders, the DSM Advisory Group and consultants, as appropriate, on topics including:
 - the development of EfficiencyOne's 2019 DSM Resource Plan, and the associated regulatory process;
 - the development of EfficiencyOne's 2020-2022 DSM Resource Plan;
 - quantifying non-energy benefits for cost-effectiveness testing purposes (see section 3.2 for more information);
 - implementing the Incentive Setting Methodology Study;
 - refining the historical Rate and Bill Impact Analysis methodology;
 - developing a Locational DSM report, in collaboration with NS Power;
 - EfficiencyOne's 2018 historical Rate and Bill Impact Analysis.
- filing of an Application for Approval of the Use of Non-Energy Benefits within the Context of Cost-Effectiveness Testing, and responding to Information Requests for the same;
- participating in the regulatory process in relation to NS Power's Advanced Metering Infrastructure (AMI) Application;
- development and filing of ENS's 2017 Evaluation Reports;
- developing quarterly and annual NSUARB reports;
- holding DSM Advisory Group meetings, including a special meeting to discuss non-energy benefits;
- filing EfficiencyOne's 2017 Audited Financial Statements and Internal Audits reports, and response to the NSUARB's Information Requests in relation to this matter;
- addressing evaluation and verification recommendations; and
- coordinating the Evaluation Consultant's and Verification Consultant's site visits and facilitating the evaluation and verification processes.

For more information on Regulatory Affairs activities, please refer to section 3 on deferred items from the 2016-2018 DSM Resource Plan regulatory process.

2016-2018 DSM RESULTS

In its Order dated October 7, 2015, the Nova Scotia Utility and Review Board (NSUARB) approved the 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.²² The NSUARB Order approved a 2016-2018 DSM investment of \$102.15 million with corresponding net incremental energy savings of 405.9 GWh and net peak demand savings of 62.5 MW.

Table 11 provides an overall summary of the 2016-2018 DSM Plan period's cumulative results, at the portfolio level. Table 12 provides a breakdown of savings and expenditures by rate class for the same three-year DSM Plan period.

²² *Supra* note 1.

Table 11: 2016-2018 DSM Plan Results - Portfolio Level

	Year	Investment (\$ million)	Lifetime Benefits (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)*	Weighted- Average Measure Life (years)	Peak Demand Savings (MW)	Cumulative Annual Demand Savings (MW)	Total Resource Cost Test (TRC)	Program Administrator Cost Test (PAC)
Approved	2016	33.2	126.6	133.1	2,115.4	15.9	20.4	339.5	2.3	4.2
	2017	34.0	138.7	136.5	2,178.4	16.0	21.0	352.7	2.4	4.4
	2018	34.9	148.3	136.3	2,190.7	16.1	21.0	356.3	2.5	4.6
	Total	102.2	413.5	405.9	6,484.0	16.0	62.5	1,048.5	2.4	4.4
Results	2016	30.8	116.2	136.9	1,972.3	14.4	26.0	389.2	2.1	3.8
	2017	30.3	121.2	130.7	1,620.8	12.4	23.7	304.3	2.2	4.0
	2018	33.9	147.7	151.4	1,778.6	11.7	25.5	319.0	2.2	4.4
	Total	95.1	385.1	419.0	5,371.8	12.8	75.2	1,012.5	2.2	4.1

Numbers may not sum due to rounding. 2018 Investment amounts are unaudited. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. 2018 results are evaluated and pending verification.

*Includes Lifetime Energy Savings for 2016 that were not evaluated.

Table 12: 2016-2018 Savings and Investment by Rate Class

Rate Class	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)*	Peak Demand Savings (MW)	Investment (\$ million)
Residential/Charitable (2,3,4)	181.8	2,506.9	38.1	46.9
Small General (10)	17.6	212.9	2.9	4.1
General Demand (11)	133.4	1,650.3	21.6	28.0
Large General (12)	20.8	261.6	3.4	3.6
Small Industrial (21)	17.3	216.4	2.8	3.3
Medium Industrial (22)	15.6	179.7	2.2	2.9
Large Industrial (23, 25)	21.9	208.5	2.5	3.6
Municipal (24)	10.6	135.4	1.7	2.7
Unmetered (999)	0.0	0.0	0.0	0.0
Total	419.0	5,371.8	75.2	95.1

Numbers may not sum due to rounding. 2018 Investment amounts are unaudited. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. 2018 results are evaluated and pending verification.

*Includes Lifetime Energy Savings for 2016 that were not evaluated.

Table 13 provides the approved and actual cumulative energy savings, demand savings and investment since 2008.

Table 13: 2008-2018 Cumulative Approved and Actual Energy and Demand Savings, and Investment

2008-2018	Approved	Results
Cumulative Incremental First-Year Energy Savings ^a (GWh)	1,230.2	1,340.1
Cumulative Incremental Peak Demand Savings ^b (MW)	216.0	252.6
Cumulative Incremental Investment ^c (\$)	357.2	333.1

^a Sum of incremental first-year energy savings from 2008-2018

^b Sum of incremental peak demand savings from 2008-2018

^c Sum of annual investment levels from 2008-2018

Table 14 provides a breakdown of the cumulative 2016-2018 expenditures and the evaluated net incremental energy and net peak demand savings results by program, for comparison with the 2016-2018 DSM Plan Compliance Filing. Table 15 provides cumulative program participation data for the 2016-2018 DSM Plan period and Table 16 provides a breakdown of cumulative unit cost for the same.

1 Table 14: 2016-2018 Approved and Actual DSM Results

		2016-2018 (Approved)					2016-2018 (Results)				
		First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Weighted- Average Measure Life (years)	Peak Demand Savings (MW)	Investment (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Weighted- Average Measure Life (years)	Peak Demand Savings (MW)	Investment (\$ million)
Residential	Efficient Product Rebates	37.6	369.1	9.8	3.3	9.93	84.5	983.5	11.6	13.1	14.2
	Existing Residential	125.7	2,461.8	19.6	22.9	31.19	78.5	1,113.0	14.2	21.2	21.2
	New Residential	11.7	350.5	30.0	3.3	3.83	11.8	373.3	31.7	3.3	5.2
	Residential Subtotal	175.0	3,181.4	18.2	29.5	44.95	174.8	2,469.9	14.1	37.7	40.4
	Low Income	22.7	417.0	18.4	2.9	5.35	22.0	228.2	10.4	3.2	5.8
Business, Not-for- profit and Institutional (BNI)	Efficient Product Rebates	98.3	1,308.7	13.3	15.8	17.23	159.7	1,816.3	11.4	25.7	22.0
	Custom Incentives	102.5	1,572.3	15.3	13.0	19.77	62.9	811.7	12.9	7.9	12.4
	Direct Installation	30.1	422.1	14.0	4.1	11.04	21.6	274.0	12.7	3.9	11.0
	BNI Subtotal	230.9	3,303.2	14.3	32.9	48.04	244.2	2,901.9	11.9	37.5	45.5
	Low Income	N/A	N/A	N/A	N/A	N/A	12.5	153.4	12.3	2.4	2.3
Totals	Programs Subtotal	405.9	6,484.6	16.0	62.5	92.99	419.0	5,371.8	12.8	75.2	86.0
	Enabling Strategies					9.17					9.0
	Total	405.9	6,484.6	16.0	62.5	102.15	419.0	5,371.8	12.8	75.2	95.1

2 Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. 2018 results are evaluated and
3 pending verification. Expenditure amounts for 2018 are unaudited.

Table 15: 2016-2018 Participation

		2016-2018 Participation	
		Total	Participation Unit
Residential	Efficient Product Rebates		
	Instant Savings	2,389,139	Units rebated
	Appliance Retirement	17,777	Units rebated
	Existing Residential		
	Home Energy Assessment ¹	2,615	Housing units
	Green Heat ¹	5,202	Housing units
	Efficient Product Installation ¹	40,909	Housing units
	First Nations Home Energy Efficiency Pilot ¹	0	Housing units
Business, Non-Profit and Institutional (BNI)	New Residential		
	New Home Construction	1,643	Participants
	Efficient Product Rebates		
	Business Energy Rebates - Mail-In	204,877	Units rebated
	Business Energy Rebates - Instant	1,117,342	Units rebated
	Custom Incentives		
	Custom ²	237	Projects
	Energy Management Information Systems ³	16	Participants
	Direct Installation		
	Small Business Energy Solutions	1,204	Projects

Participation counts are the sum of reported participation in the 2016, 2017, and 2018 Annual Progress Reports (2018 results are evaluated but not verified).

¹"Participation Unit" refers to completed projects/homes. For Green Heat, the 2016 participation unit was "systems rebated" whereas 2017 and 2018 participation reporting used "housing unit". For this table, EfficiencyOne converted "systems rebated" to housing units.

²"Participation Unit" refers to Custom projects where savings have been claimed. Some projects span multiple years; for this reason, Custom participant counts from 2016-2018 include some overlap of participation between years.

³Each participating EMIS and SEM project is counted once for the year, although participation in the program component is ongoing and most facilities generate savings every month. For this reason, EMIS and SEM participant counts from 2016-2018 include some overlap of participation between years.

Table 16: 2016- 2018 Unit Cost

		First-Year Unit Cost (\$/kWh)		
		2016-2018 (Approved)	2016-2018 (MCA)	2016-2018 (Results)
Residential	Efficient Product Rebates	0.26	0.23	0.17
	Instant Savings			
	Appliance Retirement			
	Existing Residential	0.25	0.26	0.27
	Home Energy Assessment			
	Green Heat			
	Efficient Product Installation			
	First Nations Home Energy Efficiency Pilot			
Business, Non-Profit and Institutional (BNI)	New Residential	0.33	0.41	0.44
	New Home Construction			
	Residential Subtotal	0.26	0.26	0.23
	Low Income*	0.24	0.26	0.26
Business, Non-Profit and Institutional (BNI)	Efficient Product Rebates	0.18	0.16	0.14
	Business Energy Rebates - Mail-In			
	Business Energy Rebates - Instant Rebates			
	Custom Incentives	0.19	0.20	0.20
	Custom			
	Energy Management Information Systems			
	Strategic Energy Management			
	Direct Installation	0.37	0.43	0.51
Total	Small Business Energy Solutions			
	BNI Subtotal	0.21	0.20	0.19
	Low Income*	-	0.19	0.18
Total	Programs Total	0.23	0.23	0.21
	Enabling Strategies			
	Total	0.25	0.25	0.23

First-year unit cost is provided to two decimal places due to relative magnitude of the figures. EfficiencyOne will provide comments on unit cost variances of 10% or more (actual 2016-2018 unit costs as compared to 2016-2018 Compliance Filing unit costs). For more information on these variances, please refer to the relevant program sections of this report. Unit costs are calculated using energy and demand savings at the generator, net of free-ridership and spillover. Energy savings for 2018 are evaluated but not verified.

Expenditure amounts used to calculate unit costs for the 2016-2018 Plan period are unaudited for 2018.

*Reflects tracked and estimated participation by low income customers; numbers are included in the overall Efficient Product Rebates (Residential and BNI), Existing Residential, Custom Incentives, and Direct Installation programs.

2.1 2016-2018 DSM Programs

For the 2016-2018 DSM Plan period, EfficiencyOne achieved total net incremental energy savings at the generator, for all DSM programs, of 419.0 GWh, within 3.2 percent of the Compliance Filing planned savings amount of 405.9 GWh. Achieved total net peak demand savings at the generator, for all DSM programs, were 75.2 MW, compared to the Compliance Filing planned savings amount of 62.5 MW. Total expenditures were \$95.1 million, compared to the approved investment amount of \$102.2 million, lower by seven percent. These savings and expenditures include results from both the Residential and the Business, Non-Profit and Institutional (BNI) sectors. Total ratepayer benefits resulting from 2016-2018 energy savings are \$385.1 million.²³ Individual program results are presented in the following sections and are compared to the Compliance Filing at the program level.

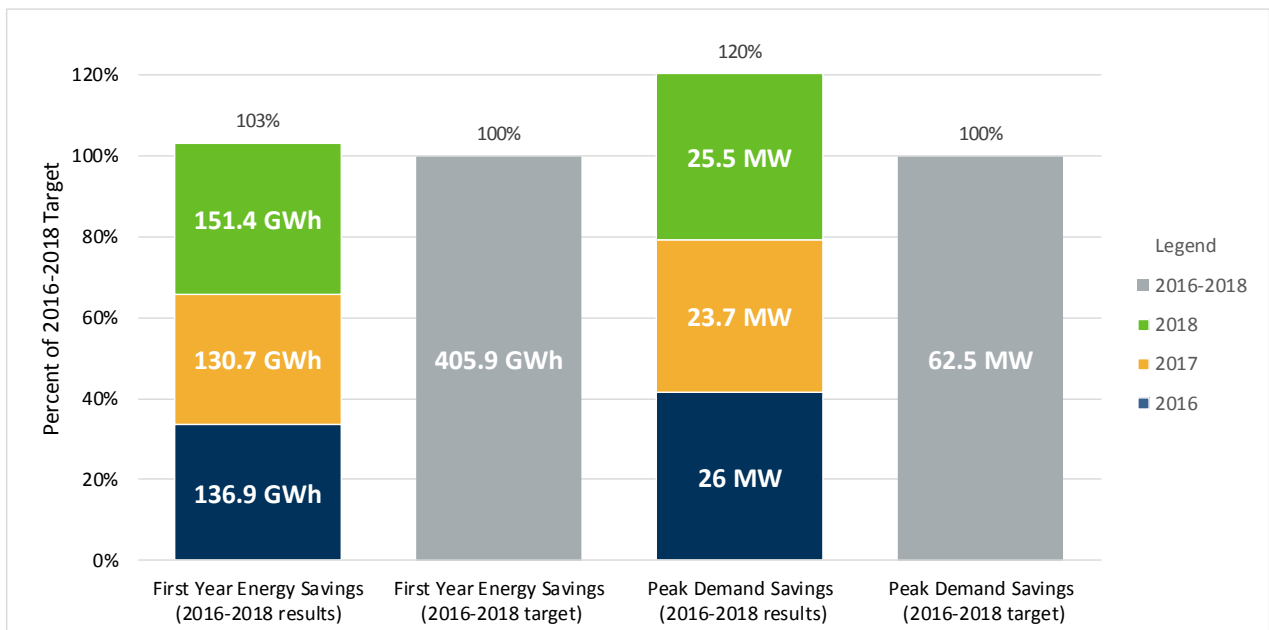
Using the average NS Power emissions intensity for 2017, DSM measures installed in the 2016-2018 Plan period are estimated to result in 256.7 kt of annual avoided CO₂e emissions.

Figure 2 below shows EfficiencyOne's cumulative results by year towards the NSUARB-approved net incremental energy and net peak demand savings targets in the 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.²⁴ Figure 3 presents EfficiencyOne's 2016-2018 DSM expenditures.

²³ Lifetime benefits are expressed as the net present value of the avoided costs, including energy and capacity, over the life of the program measures.

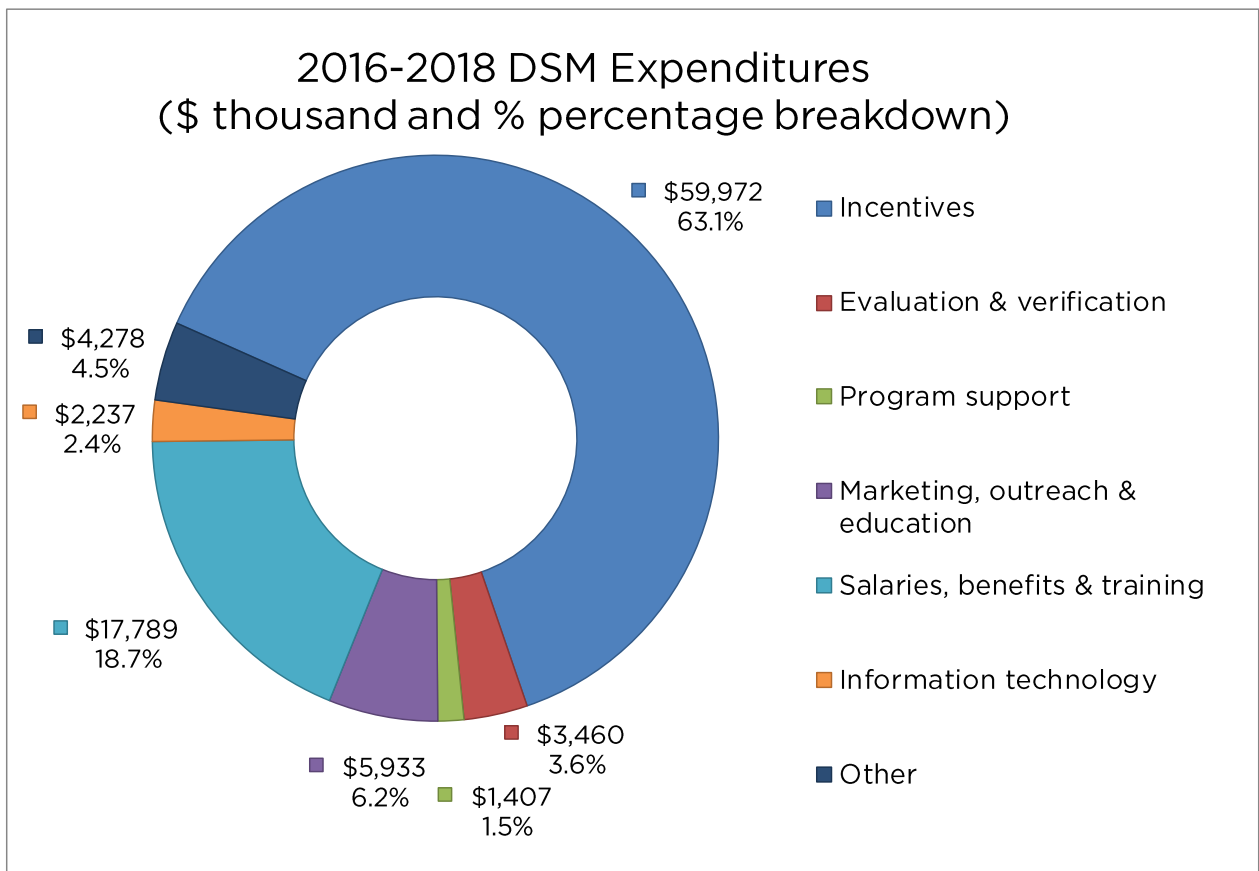
²⁴ *Supra* note 1.

Figure 2: 2016-2018 DSM Results as Compared to 2016-2018 Targets



Energy and demand savings are calculated at the generator and net of free-ridership and spillover. 2016-2017 results are evaluated and verified. 2018 results are evaluated and pending verification.

Figure 3: 2016-2018 DSM Expenditures



Expenditures are rounded to the nearest thousand. Expenditure input amounts for 2018 are unaudited.

2.2 Residential Sector Results

During the 2016 to 2018 DSM Plan period, the Residential sector achieved net incremental energy savings of 174.8 GWh and net peak demand savings of 37.7 MW compared to the Compliance Filing planned savings of 175.0 GWh and 29.5 MW, respectively. The Residential sector comprises the following programs:

- Residential Efficient Product Rebates;
- Existing Residential; and
- New Residential.

2.2.1 Residential Efficient Product Rebates

For the 2016-2018 DSM Plan period, the Residential EPR program achieved net incremental energy savings of 84.5 GWh and net peak demand savings of 13.1 MW compared to the Compliance Filing planned savings of 37.6 GWh and 3.3 MW, respectively. Residential EPR comprises the following program components:

- Instant Savings; and
- Appliance Retirement.

Residential EPR exceeded its Compliance Filing planned savings for the 2016-2018 Plan period, primarily due to the success of the Instant Savings program component, which saw over 2,389,000 energy efficient products sold over three years.

Following significantly higher-than-expected savings in 2015 for Residential EPR, the 2016 mid-course adjustment reflected the expectation that this momentum would continue. Throughout the remainder of the Plan period, Residential EPR continued to see higher-than-expected savings year-over-year, resulting in significant mid-course adjustments annually. These mid-course adjusted planned savings were then further exceeded in the respective years' annual results.

The majority of Residential EPR's savings are from the annual spring and fall savings campaigns. These results are attributed to strong demand for LEDs, strong retailer support and effective engagement events during the campaigns, meaningful marketing strategies, and increased public awareness.

Residential EPR expenditures for the three-year Plan period were also higher than the planned amount in the Compliance Filing, due to the increased participation in Instant Savings, although to a lesser degree than observed with the net incremental energy savings and net peak demand savings. This is due to higher-than-anticipated sales of LED multipacks, which have a lower per-kWh rebate, resulting in the Residential EPR

unit cost for the 2016-2018 Plan period being 37 percent lower than that in the Compliance Filing.²⁵

Other Residential EPR highlights from the 2016-2018 DSM Plan period included:

- the retirement of 17,777 inefficient appliances via Appliance Retirement;
- an Appliance Retirement pilot that began in 2016 where additional rebates could be claimed on select mini-appliances when accompanying an eligible large appliance. This pilot was incorporated into Appliance Retirement in Q3 of 2017;
- an Appliance Retirement pilot project in partnership with the Halifax Regional Centre for Education (HRCE), formerly known as the Halifax Regional School Board (HRSB); and
- an Instant Savings Indoor Air Quality Pilot, in fall of 2017, resulting in ENERGY STAR[®] certified air purifiers and dehumidifiers being added to the range of measures available to customers.

2.2.2 Existing Residential

For the 2016-2018 DSM Plan period, the Existing Residential program achieved net incremental energy savings of 78.5 GWh and net peak demand savings of 21.2 MW compared to the Compliance Filing planned savings of 125.7 GWh and 22.9 MW, respectively. The Existing Residential program comprises the following program components:

- Home Energy Assessment;
- Green Heat;
- Efficient Product Installation;²⁶ and

²⁵ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 16 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

- First Nations Home Energy Efficiency Pilot.

Existing Residential fell short of its planned net incremental energy savings for the 2016-2018 DSM Plan period, as compared to the Compliance Filing. This shortfall was offset by strong results in other EfficiencyOne programs such as Residential EPR and BER and is primarily attributed to the performance of the EPI program component. EPI has observed a trend of decreasing participation over the 2016-2018 Plan period, attributed to the decreasing pool of potential participants. In addition, EPI has observed fewer installation opportunities per home resulting in lower average savings per home than anticipated. This also resulted in expenditures over the three-year Plan period being lower than expected.

Other notable highlights within the Existing Residential program during the 2016-2018 DSM Plan period include:

- a total of 2,615 homes implementing energy-efficient upgrades through HEA;
- a total of 5,202 homes participating in Green Heat;
- a total of 40,909 homes taking part in EPI (includes participation in the former RDI and RPC program components before it merged to become EPI);
- Green Heat moving to a post-purchase, mail-in rebate structure in August, 2017;
- changes to the HEA incentive structure in Q3 of 2018, detailed further in section 1.2.2;

²⁶ EPI consists of the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components within the Existing Residential program. These two program components merged to form EPI on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia. Efficient Product Installation (EPI) was previously referred to as Residential Direct Install (RDI) in the 2017 Mid-Course Adjustment filing within EfficiencyOne's 2017 DSM Annual Progress Report (see M07964, *The Public Utilities Act, RSNS 1989, c 390, as amended and Efficiency Nova Scotia's 2017 Annual Progress Report* [ENS 2017 DSM Annual Progress Report], [31 Mar, 2017]). The RDI program component name was changed to EPI in 2017 to more accurately reflect the service offered, however, the mid-course adjusted plan amounts remained the same.

- HEA transitioning to the updated EnerGuide Rating System (ERS) from NRCan, in Q3 of 2017;
- the launch of the HEA EnerGuide Real Estate Listing pilot in Q4 of 2017; and
- the addition of the First Nations Home Energy Efficiency pilot in 2018.

2.2.3 New Residential

For the 2016-2018 DSM Plan period, the New Residential program, marketed as NHC, achieved net incremental energy savings of 11.8 GWh and net peak demand savings of 3.3 MW compared to the Compliance Filing planned savings of 11.7 GWh and 3.3 MW, respectively.

NHC introduced a new incentive structure on January 1, 2016 in order to simplify the program and reduce participation barriers. In 2017, NHC updated its incentives further based on participant feedback, as well as Evaluator and Verifier recommendations. The increase in incentives resulted in a significant change in the 2017 and 2018 mid-course adjusted planned expenditures, as compared to the Compliance Filing for each respective year.

While NHC achieved its planned net incremental energy and net peak demand savings for the Plan period in the Compliance Filing, it exceeded the corresponding planned investment amount due to the incentive changes noted above. This also impacted the unit cost for NHC over the three-year Plan period resulting in a 34 percent increase above the Compliance Filing unit cost amount.²⁷

Other NHC activities in 2016-2018 included:

²⁷ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 16 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

- a total of 1,643 energy efficient new homes being built through NHC;
- the introduction of a Passive House pilot, in order to encourage more Passive House construction;
- NHC transitioning to the updated ERS from NRCan in Q3 of 2017; and
- The introduction on December 3, 2018 of a new incentive structure; please refer to section 1.2.3 for more details.

2.3 Business, Non-Profit and Institutional Sector Results

During the 2016 to 2018 DSM Plan period, the BNI sector achieved net incremental energy savings of 244.2 GWh and net peak demand savings of 37.5 MW compared to the Compliance Filing planned savings of 230.9 GWh and 32.9 MW, respectively. The BNI sector was comprised of the following programs:

- BNI Efficient Product Rebates;
- Custom Incentives; and
- Direct Installation.

2.3.1 BNI Efficient Product Rebates

For the 2016-2018 DSM Plan period, BNI Efficient Product Rebates, marketed as BER, achieved net incremental energy savings of 159.7 GWh and net peak demand savings of 25.7 MW compared to the Compliance Filing planned savings of 98.3 GWh and 15.8 MW, respectively.

BER achieved significantly higher savings than expected during the 2016-2018 Plan period, as compared to the Compliance Filing, primarily resulting from higher-than-expected participation in the Instant Rebates service, attributed to strong demand for LEDs, repeat participants, strong distributor performance, business development activities, and marketing efforts. BER has observed continued growth throughout the Plan period, with the annual mid-course adjustments reflecting this trend. As a result of the higher number of rebates issued and resultant savings claimed, expenditures for

BER were also higher for the three-year Plan period, as compared to the investment level in the Compliance Filing. However, due to a higher proportion of sales of measures with a lower unit cost primarily via Instant Rebates, the overall unit cost for BER from 2016-2018 was 21 percent lower than that approved in the Compliance Filing.²⁸

A number of new rebates were added during the Plan period and BER underwent incentive reviews and updates, as well as process improvements to enhance the participant experience.

2.3.2 Custom Incentives

During the 2016 to 2018 DSM Plan period, Custom Incentives achieved net incremental energy savings of 62.9 GWh and net peak demand savings of 7.9 MW compared to the Compliance Filing planned savings of 102.5 GWh and 12.9 MW, respectively. Custom Incentives comprises the following components:

- Custom;
- Energy Management Information Systems (EMIS); and
- Strategic Energy Management (SEM).

Custom Incentives did not achieve its planned savings for the 2016-2018 Plan period primarily due to lower-than-expected savings in the Custom program component. Custom's results were primarily impacted by project-specific timeline delays in 2017 and 2018, as well as lower-than-expected savings per participant, reflected in the 2018 mid-course adjustment. As a result of this, Custom Incentives also saw lower

²⁸ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 16 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

expenditures over the three-year Plan period, as compared to the Compliance Filing amount.

Other highlights and activities during the 2016-2018 Plan period included:

- the completion of 237 Custom projects;
- a variety of pilots in the Custom component;
- an EMIS fault-detection software pilot; and
- the introduction of a flexible approach for SEM participants in 2018, in contrast to the cohort model used in prior years, in order to increase accessibility and participation rates, and better accommodate individual participants' needs.

2.3.3 Direct Installation

During the 2016 to 2018 DSM Plan period, Direct Installation, marketed as SBES achieved net incremental energy savings of 21.6 GWh and net peak demand savings of 3.9 MW compared to the Compliance Filing planned savings of 30.1 GWh and 4.1 MW, respectively.

While SBES achieved increased savings year-on-year through the three-year Plan period, resulting from over 1,200 projects, it fell short of its planned net incremental energy savings for 2016-2018, as compared to the Compliance Filing. This was primarily due to lower-than-anticipated savings in 2016 resulting from the program transition from Business Energy Solutions (BES) to SBES on August 1, 2015, which saw adjusted incentives, lowered incentive caps and changes to the delivery model. An additional contributing factor was a lack of historic forecasting information for the new SBES program, since the 2016 Plan forecasting information was based largely on the former BES program. The anticipated impact of these circumstances was reflected in the mid-course adjustments for savings and expenditures in both 2016 and 2017 and

1 also affected the unit cost for the three-year Plan period, which was 39 percent higher
2 as compared to the Compliance Filing.²⁹ In response, EfficiencyOne undertook a
3 range of SBES mitigation efforts including streamlining of the process for determining
4 eligibility, developing videos to help contractors learn the new process, revising
5 lighting incentives, and placing a high priority on contractor and participant outreach
6 efforts. Following implementation of these mitigation strategies, SBES achieved
7 significantly higher annual savings, coupled with a decrease in unit cost, in 2017 and
8 2018, in comparison to the 2016 results, as detailed in the Direct Installation Program
9 2018 Evaluation Report.³⁰

10
11 SBES also launched an Affordable Multifamily Housing Pilot in 2016, which continued
12 throughout the 2016-2018 DSM Plan period. This pilot aimed to provide affordable
13 housing owners with incentives for building-wide, energy retrofit projects using the
14 same frameworks as the SBES delivery model, with the addition of an affordable
15 housing criterion rather than an energy consumption requirement. The pilot achieved
16 the initial target level of participation by the end of 2017 with 17 participants
17 undergoing an energy audit to identify energy-efficiency upgrade opportunities. A
18 number of resultant upgrade projects took place in 2017, however, participant
19 feedback indicated that participants did not have sufficient available capital to
20 complete projects, even with the incentive levels. In 2018, EfficiencyOne revised the
21 pilot incentive structure and re-engaged with audit participants, in addition to
22 modifying eligibility requirements to permit housing co-ops to participate. These
23 changes resulted in three additional audits and four project completions in Q4 of 2018.
24 Since the pilot began in 2016, there have been 15 project completions in total.

²⁹ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 16 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

³⁰ *Supra* note 18 at p. 7

2.4 Low-Income Highlights

Within the Residential and BNI results highlighted in Table 14, EfficiencyOne supported the following work for low-income Nova Scotians in the 2016-2018 DSM Plan period (based on direct information where provided or demographic data):

- 17,548 low-income Nova Scotians received free installation of low-cost energy efficiency measures through the EPI program component;
- 1,319 low-income participants received rebates to replace or retire old, inefficient appliances;
- 83,115 units were sold or replaced through the Residential and BNI Efficient Product Rebates programs, via the Residential Instant Savings program component and the BNI Business Energy Rebates (Instant Rebates service) program component; and
- 260 apartment buildings received rebates through BNI programs, resulting in energy savings for the low-income Nova Scotians who live in those buildings.

Incidental Low-Income Impacts

In addition to HomeWarming and the SBES Affordable Multifamily Housing Pilot, which are dedicated offerings for low-income Nova Scotians, EfficiencyOne generates incidental low-income impacts through programs that are not specifically targeted at this segment. For example, a portion of efficient product installations are performed in low-income households. EfficiencyOne has used a variety of methods, where appropriate on a program-by-program basis, to estimate the proportion of low-income energy savings, program costs, and participation in these programs, which are presented in Table 17, below.

Table 17: 2016-2018 Low-Income Results

Low Income Participation (2016-2018)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ million)	Participation (#)	Participation Unit
Residential Programs						
Efficient Product Rebates	2.0	18.8	0.3	1.1		
Instant Savings ¹	1.1	12.7	0.2	0.1	22,912	Units rebated
Appliance Retirement ^{1,2}	1.0	6.1	0.1	0.9	1,319	Units rebated
Existing Residential	20.0	209.3	2.9	4.7		
Home Energy Assessments ³	-	-	-	-	-	
Green Heating Systems ³	-	-	-	-	-	
Efficient Product Installation Service	20.0	209.3	2.9	4.6	17,548	Housing units
First Nations Home Energy Efficiency Pilot	0.0	0.0	0.0	0.1	-	Housing units
New Residential						
New Home Construction ³	-	-	-	-	-	
Residential Subtotal⁹	22.0	228.2	3.2	5.7	41,779	
BNI Programs						
Efficient Product Rebates	8.6	100.4	1.8	1.0		
Business Energy Rebates - Mail-In ^{6,7}	2.7	30.1	0.7	0.3	113	Buildings retrofitted
Business Energy Rebates - Instant ^{6,8}	6.0	70.2	1.2	0.7	60,203	Units rebated
Custom Incentives	2.5	36.9	0.3	0.5		
Custom ^{6,7}	2.5	36.9	0.3	0.5	29	Buildings retrofitted
Energy Management Information Systems ³	-	-	-	-	-	
Strategic Energy Management ³	-	-	-	-	-	
Direct Installation	1.3	16.2	0.3	0.7		
Small Business Energy Solutions ^{6,7}	1.3	16.2	0.3	0.7	118	Buildings retrofitted
BNI Subtotal⁹	12.4	153.5	2.4	2.3	60,463	
Programs Total⁹	34.4	381.6	5.6	8.0	102,242	

Numbers may not sum due to rounding. Energy and demand savings are calculated at the generator and are net of free-ridership and spillover. Expenditure amounts are unaudited.

¹ Low-income Nova Scotians are assumed to be 10 percent as likely to participate as the general population; this assumption may be revised in the future as EfficiencyOne further refines its methodology for calculating low income participation rates relative to the general population.

² Includes appliance replacements delivered through the HomeWarming service.

³ Participation by low-income Nova Scotians is assumed to be zero.

⁴ Income disclosure is optional for program participation. Low-income participants are tracked where income information is available; otherwise low-income Nova Scotians are assumed to participate in proportion to the general population within each county.

⁵ Includes projects through Housing Nova Scotia (HNS); for non-HNS projects, the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

⁶ Although the program participants are building owners, the avoided energy benefits are assumed to flow through to tenants; the proportion of low-income tenants in participating apartments is assumed to be the same as the proportion of low-income tenants in Nova Scotia apartments overall.

⁷ Participation numbers are totals that include varying proportions of low-income and non low-income tenants. Investment and savings are estimated for the low-income portion.

⁸ The exact installation location of products receiving Business Energy Rebates (BER) Instant Rebates is unknown. The proportion of BER Instant Rebates measures installed in apartments is assumed to be the same as the proportion of BER Mail-In Rebates installed in apartments.

⁹ Participant total contains mixed units, i.e. the sum of all participants listed by program component.

2.5 Enabling Strategies

Enabling Strategies played a strong role in enabling energy-efficiency services and programs to continue achieving savings through the 2016-2018 DSM Plan period. Enabling Strategies indirectly facilitate future savings within programs and have three key objectives:

- increase awareness of, and education about, DSM programs and services, which is key to driving participation in energy-efficiency activities;
- evolve DSM services through innovation and improve delivery of these services to Nova Scotians; and
- drive market transformation.

2016-2018 Enabling Strategies categories included:

- Education and Outreach;
- Development and Research; and
- Other Enabling Strategies.

2.5.1 Education and Outreach

Education and Outreach strategies aim to foster a culture of energy efficiency throughout the province by creating awareness of and providing information about energy efficiency to stakeholders, partners, community groups, students, families and businesses. These strategies are designed to highlight the value of energy efficiency and ways to achieve energy savings that lower electric utility bills and increase comfort in Nova Scotians' homes and businesses.

An extensive range of Education and Outreach activities were undertaken during the 2016-2018 DSM Plan period. These included:

- continued engagement with Nova Scotians through social media (Facebook, Twitter, YouTube, LinkedIn, and Instagram) to drive awareness and create a culture of energy efficiency;
- the launch of a new Efficiency Nova Scotia website in April 2016 providing a more participant-centric experience for visitors;
- hosting of and participation in events across Nova Scotia to build awareness of BNI program offerings;
- distribution of Residential and BNI electronic newsletters;
- the hosting of the annual Bright Business Conference;
- continuing to offer and build the Green Schools program, with over two-thirds of schools in Nova Scotia being reached by the end of 2018;
- working with post-secondary institutions to deliver energy efficiency courses;
- public speaking engagements, presentations to community groups and businesses, and attending community events, home shows and trade shows; and
- working with delivery agents, industry partners and educational institutions to develop, manage, and deliver outreach programs.

2.5.2 Development and Research

During the 2016-2018 DSM Plan period, development and research activities included:

- Incentive Setting Methodology Study and implementation;
- Small Business Energy Study;
- Residential Socket Study;
- DSM data tracking system implementation;
- electronic Technical Reference Manual (eTRM) development;
- tracking quality assurance and participant satisfaction;
- tracking other attitudinal metrics among the general population of Nova Scotian households to help EfficiencyOne respond to changing market conditions;

- a review of the economic impact of the energy efficiency industry in Nova Scotia; and
- receipt, analysis and utilization of NS Power customer usage data to aid in program-specific marketing campaigns and promotions.

For more detail on the activities listed above that took place in 2018, please refer to section 1.5.2 of this report, and also to EfficiencyOne's annual and quarterly DSM reports for the 2016-2018 DSM Plan period, filed with the NSUARB, for activities that took place in 2016 and 2017.

2.5.3 Other Enabling Strategies

Other Enabling Strategies included the following sub-categories during the 2016-2018 DSM Plan period:

- PACE Financing;
- Capacity Building;
- Working with Governments; and
- Regulatory Affairs.

PACE Financing

At the end of the 2016-2018 DSM Plan period, EfficiencyOne was administering PACE programs for two municipalities and their residents with eight municipalities in total offering PACE financing to homeowners for energy-efficiency measures. Please refer to section 1.5.3 for further information on PACE financing.

Capacity Building

EfficiencyOne continued to support and grow the energy efficiency industry in Nova Scotia during the 2016-2018 Plan period through the ETN, the goal of which is to develop a network that will, through education and engagement:

- drive energy savings and increase participation in EfficiencyOne services;
- build industry capacity for energy-efficiency work in Nova Scotia; and
- deliver demonstrable value to its members.

EfficiencyOne continued to strengthen its relationship with industry stakeholders throughout the 2016-2018 Plan period with ETN activities including:

- hosting, sponsoring and assisting in organizing training and events, and by offering exclusive discounts to ETN members who attended;
- the launch of a new procurement platform and associated training for employees and interested vendors;
- EfficiencyOne's annual Bright Business Conference;
- the launch of *The Network News* in 2016, the ETN's bi-monthly newsletter that highlights updates on programs, pilots, procurement opportunities, helpful tips, training, events, and more; and
- the creation of an enhanced online ETN directory, as well as online "Helpful Guides" to assist participants in hiring of contractors.

These efforts have resulted in a four-fold increase in ETN membership since 2016 to over 200 by the end of 2018.

EfficiencyOne also fostered awareness of the Passive House concept in Nova Scotia via hosting of a training course in 2016, partnering with the Discovery Centre in 2016 to develop a Passive House exhibit, and development of a video for Housing Nova Scotia in 2017 highlighting a project that demonstrated Passive House principles.

Working with Governments

EfficiencyOne works with governments to advance the introduction of energy-efficient products and technologies, through assisting in the creation of effective regulations designed to save Nova Scotians money, and decrease the environmental effects of energy use.

During the 2016-2018 DSM Plan period, EfficiencyOne supported the ongoing development of Canadian energy efficiency standards by:

- participating in the Canadian Standards Association's Steering Committee on Performance Energy Efficiency and Renewables (SCOPEER) and the Strategic Resource Task Force (SRTF) committee;
- assisting in the development of proposed changes to the National Energy Code for Buildings (NECB) developed by NRCan;
- participating in the Atlantic Heat Pump Working Group organized by the Atlantic Canada Opportunities Agency (ACOA);
- continuing to facilitate the evaluation of impacts relating to code and regulation changes on an annual basis;
- continuing to provide feedback on market transformation initiatives for key technologies relating to Canada's Pan-Canadian Framework on Clean Growth and Climate Change; and
- providing provincial and federal governments with general technical support and market insights in an effort to support the continued development of energy efficiency-related standards, products, and codes and regulations.

The ongoing development of energy efficiency codes, standards and regulations serves to ensure continued progress relating to the transformation of markets for energy-consuming products and technologies, toward higher-performing, more energy-efficient product types. These changes ensure end-users have access to energy-efficient products and equipment, with the associated cost savings and decreased environmental impact, relative to existing products.

Regulatory Affairs

Regulatory Affairs activities enable EfficiencyOne to meet its regulatory requirements and provide a fair and transparent process for stakeholders and Nova Scotians to offer input into DSM Resource Plans, programs, and investments.

During the 2016-2018 DSM Plan period, Regulatory Affairs activities included:

- engaging with regulatory stakeholders, the DSM Advisory Group and consultants, as appropriate through DSM Advisory Group meetings and technical sessions;
- gaining NSUARB approval of the following:
 - EfficiencyOne's Affiliate Code of Conduct;
 - the provision of customer electricity data from NS Power; and
 - the 2019 DSM Resource Plan.
- EfficiencyOne's 2016, 2017, and 2018 historical Rate and Bill Impact Analysis and working to refine the methodology of the same;
- development of a standardized filing framework for future DSM Resource Plan applications;
- implementing the Incentive Setting Methodology Study;
- developing a Locational DSM report, in collaboration with NS Power;
- filing of an Application for Approval of the Use of Non-Energy Benefits within the Context of Cost-Effectiveness Testing, and responding to Information Requests for the same; please refer to section 3 for further information;
- Participating in the regulatory process in relation to NS Power's Advanced Metering Infrastructure (AMI) Application;
- development and filing of ENS's 2016, 2017, and 2018 Evaluation Reports;
- developing and filing Quarterly and Annual NSUARB reports;
- filing EfficiencyOne's 2016, 2017, and 2018 Audited Financial Statements and Internal Audits reports and response to the NSUARB's Information Requests

- 1 in relation to these matters; addressing evaluation and verification
2 recommendations;
- 3 • coordinating the Evaluation Consultant's and Verification Consultant's site
4 visits and facilitating the evaluation and verification processes.

3 UPDATES ON ITEMS ARISING FROM THE 2016-2018 REGULATORY PROCESS

Throughout the 2016-2018 DSM Resource Plan regulatory process, various items arose from or were deferred under the NSUARB Order,³¹ the NSUARB-approved 2016-2018 DSM Plan Consensus Agreement (Consensus Agreement),³² and the 2016-2018 Quantum Agreement.³³ The statuses of the items that remained open in 2018 are discussed below.

3.1 Locational DSM Efforts

In accordance with the NSUARB's direction in its Order dated October 17, 2015, EfficiencyOne and NS Power filed a collaborative report on locational DSM efforts (i.e., geotargeting), on 23 December 2016.³⁴ Further to the NSUARB's letter of January 6, 2017, EfficiencyOne and NS Power filed a further report on August 14, 2017.³⁵

³¹ *Supra* note 1.

³² *Ibid* at Schedule B.

³³ M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix C; the Quantum Agreement was signed by representatives of EfficiencyOne, the Consumer Advocate, the Small Business Advocate, the Affordable Energy Coalition, and the Ecology Action Centre. Although the Quantum Agreement was not approved by the NSUARB, the NSUARB Decision indicated its understanding that "the non-financial provisions of the Quantum Agreement will be pursued by E1, NSPI and other stakeholders through the DSM Advisory Group" (*Ibid* at para 27). As such, EfficiencyOne is addressing these items alongside the other items that arose from the 2016-2018 Regulatory process.

³⁴ See M06733, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities*, [2016 Locational DSM Report], [23 Dec 2016].

³⁵ See M07815, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities*, [2017 Locational DSM Report], [14 Aug 2017].

1 In response to the NSUARB's letter dated October 26, 2017, EfficiencyOne and NS
2 Power filed a further update³⁶ on June 29, 2018, in which they proposed to:

- 3 • conduct a pilot system peak reduction program ("Locational DSM Pilot") and to
4 work together and coordinate with the DSM Advisory Group to finalize its
5 design; and
- 6 • fund the Locational DSM Pilot using the \$1M proposed for Demand Reduction
7 activities in 2019.

8
9 These requests were approved by the NSUARB on July 11, 2018, with an additional
10 update requested by June 30, 2019.

11
12 EfficiencyOne engaged with the DSM Advisory Group in January 2019 regarding
13 preliminary program designs for the pilot, and the proposed schedule for
14 implementation. Key next steps in the pilot design process include the following:

- 15 • EfficiencyOne intends to continue to engage with the DSM Advisory Group as
16 design progresses for the Locational DSM Pilot:
- 17 • the Locational DSM Pilot is expected to launch in 2019, and operate throughout
18 2019 and 2020; and
- 19 • pilot evaluation is expected to occur in early 2021.

20
21 EfficiencyOne looks forward to continued collaboration with NS Power on locational
22 DSM efforts and will provide an update to the NSUARB by June 30, 2019.

³⁶ See M07815, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities* [2018 Locational DSM Report], [29 June 2018] at p. 21.

3.2 Cost-Effectiveness Testing

In the 2016-2018 Quantum Agreement, the DSM Advisory Group agreed to work to achieve consensus as to the methodology and assumptions of the cost- effectiveness screening test to be applied to future DSM Resource Plans.³⁷ In EfficiencyOne's July 22, 2016 Settlement Agreement on the outstanding items from the 2016-2018 DSM Resource Plan regulatory process, stakeholders agreed to "work collaboratively with the DSM Advisory Group to pursue the nature and quantification of estimates associated with participant non-energy benefits to improve the Total Resource Cost (TRC) test in future Applications."³⁸

Further to this Settlement Agreement, EfficiencyOne consulted with the DSM Advisory Group throughout 2016 and 2017 regarding the general approach to quantify non-energy benefits within the Nova Scotian TRC test. Vermont Energy Investment Corporation (VEIC) was procured by EfficiencyOne to undertake a study into measure-level benefits and, following continued engagement with the DSM Advisory Group on the study results, EfficiencyOne filed its Application for Approval of the Use of Measure Level Non-Energy Benefits within the Context of Cost-Effectiveness Testing with the NSUARB on September 19, 2018.³⁹

³⁷ *Supra* note 33 at s. 7.

³⁸ See M06733, *The Public Utilities Act, RSNS, 1989, c 380 and the order of the Nova Scotia Utility and Review Board in Matter M06733 directing the parties to pursue resolution of certain matters set out in settlement agreements therein within the DSM Advisory Group and The Application of EfficiencyOne for approval of the matters agreed upon within the DSM Advisory Group and for determination of unresolved issues* [Settlement Agreement], [22 July 2016], item 7(a).

³⁹ See M08888, *The Public Utilities Act and An Application for Approval of the Use of Measure-level Non-Energy Benefits within the Context of Cost-Effectiveness Testing associated with future DSM planning regulatory processes*, [19 September 2018]

On October 1, 2018, the NSUARB issued a Hearing Order⁴⁰ establishing a regulatory process and on November 14, 2018, EfficiencyOne filed its responses to Stakeholder Information Requests. On November 23, 2018, the NSUARB issued a Board Order adjourning the hearing following EfficiencyOne's request to defer regulatory proceeding in order to enable additional consultation with participants.⁴¹ The Order detailed a timetable for 2019, as recommended by EfficiencyOne, to be followed prior to ordering a new hearing date and requiring EfficiencyOne to file an update with the NSUARB and to request the regulatory process be resumed.

3.3 Update on Evaluation and Verification Recommendations

An update on the status of evaluation and verification recommendations is set out in Attachment 1.

⁴⁰ *Ibid* [NSUARB Hearing Order], [1 October 2018]

⁴¹ *Ibid* [NSUARB Board Order], [23 November 2018]

4 PLANNED AND ACTUAL DSM EXPENDITURES

The October 7, 2015 NSUARB Order directed NS Power to file its proposed accounting treatment and cost recovery for the 2015 DSM programs and the 2016-2018 programs.⁴² To aid in such cost recovery calculations, EfficiencyOne will report on planned and actual DSM expenditures by rate class. Table 18, Table 19, Table 20 and Table 21 present 2015, 2016, 2017, and 2018 planned and actual⁴³ DSM expenditures.

Table 18: 2015 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2015 Expenditures (\$ million)	Actual 2015 Expenditures (\$ million)
Residential/Charitable (2,3,4)	21.0	16.6
Small General (10)	2.4	1.1
General Demand (11)	10.1	8.8
Large General (12)	1.9	0.9
Small Industrial (21)	0.9	1.0
Medium Industrial (22)	0.9	1.1
Large Industrial (23, 25)	0.8	1.7
Municipal (24)	0.7	0.9
Unmetered (999)	0.3	0.0
Total	39.0	32.0

Numbers may not sum due to rounding.

* "Planned 2015 Expenditures" refers to the planned annual mid-course adjusted amount.

⁴² *Supra* note 1 at p 2, item 8.

⁴³ 2018 expenditures are unaudited.

Table 19: 2016 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2016 Expenditures (\$ million)	Actual 2016 Expenditures (\$ million)
Residential/Charitable (2,3,4)	16.6	16.8
Small General (10)	1.3	1.0
General Demand (11)	8.7	8.2
Large General (12)	1.8	1.0
Small Industrial (21)	0.9	1.1
Medium Industrial (22)	1.0	0.9
Large Industrial (23, 25)	2.1	1.1
Municipal (24)	0.7	0.8
Unmetered (999)	0.0	0.0
Total	33.2	30.8

Numbers may not sum due to rounding.

* "Planned 2016 Expenditures" refers to the planned annual mid-course adjusted amount.

Table 20: 2017 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2017 Expenditures* (\$ million)	Actual 2017 Expenditures (\$ million)
Residential/Charitable (2,3,4)	17.5	14.8
Small General (10)	1.1	0.9
General Demand (11)	10.1	9.0
Large General (12)	1.1	1.3
Small Industrial (21)	1.2	1.1
Medium Industrial (22)	1.2	0.9
Large Industrial (23, 25)	1.7	1.3
Municipal (24)	0.7	1.0
Unmetered (999)	0.0	0.0
Total	34.6	30.3

Numbers may not sum due to rounding.

* "Planned 2017 Expenditures" refers to the planned annual mid-course adjusted amount.

Table 21: 2018 Planned and Actual DSM Expenditures by Rate Class

Rate Code	Planned 2018 Expenditures* (\$ million)	Actual 2018 Expenditures (\$ million)
Residential/Charitable (2,3,4)	15.9	15.3
Small General (10)	1.0	2.2
General Demand (11)	10.3	10.8
Large General (12)	1.5	1.4
Small Industrial (21)	1.3	1.1
Medium Industrial (22)	1.1	1.1
Large Industrial (23, 25)	1.7	1.2
Municipal (24)	1.2	0.8
Unmetered (999)	0.0	0.0
Total	33.9	33.9

Numbers may not sum due to rounding. Expenditure amounts are unaudited.

* "Planned 2018 Expenditures" refers to the planned annual mid-course adjusted amount.

5 2019 PLANNED ACTIVITIES

In 2019, EfficiencyOne will continue to build on its previous successes and contribute to fostering an energy efficient culture in Nova Scotia. Table 22 below details the NSUARB-approved 2019 DSM net incremental energy and net peak demand savings targets (at the generator) for 2019 of 127.2 GWh and 20.2 MW, within the NSUARB-approved investment amount of \$34.1 million.⁴⁴ EfficiencyOne will provide its mid-course adjustments for 2019, by program and their customer rate class impacts, within its 2019 Q1 DSM Report, due to be filed in May, 2019.

Table 22 : 2019 DSM Resource Plan Savings and Investment

2019	Investment (\$ million)	Incremental Annual Net Energy Savings at the Generator (GWh)	Lifetime Net Energy Savings at the Generator (GWh) ^a	Incremental Annual Net Demand Savings at the Generator (MW)	First Year Unit Cost (\$/kWh)	Lifetime Unit Cost (\$/kWh) ^a
Residential DSM Programs						
Efficient Product Rebates	3.5	14.9	132.9	1.5	0.235	0.026
Existing Residential ^b	8.6	31.0	422.2	7.0	0.276	0.020
New Residential	2.2	5.3	157.5	1.6	0.410	0.014
Residential Total	14.2	51.2	712.6	10.0	0.278	0.020
Business, Nonprofit and Institutional Programs						
Efficient Product Rebates	5.2	32.5	380.3	5.1	0.160	0.014
Custom Incentives	6.1	34.3	427.2	3.6	0.176	0.014
Direct Installation	4.1	9.3	118.4	1.5	0.443	0.035
BNI Total	15.4	76.1	925.8	10.2	0.202	0.017
Enabling Strategies						
Education & Outreach	1.6	n/a	n/a	n/a	n/a	n/a
Development & Research	2.2	n/a	n/a	n/a	n/a	n/a
Other Enabling Strategies	0.7	n/a	n/a	n/a	n/a	n/a
Enabling Strategies Total	4.5	n/a	n/a	n/a	n/a	n/a
Total	34.1	127.2	1638.4	20.2	0.268	0.021

Columns may not sum correctly due to rounding.

^a Based on values of program Weighted Average Measure Lives, which have been derived from the 2017 Evaluation process.

^b Includes participation by low-income households.

⁴⁴ See M08604, *The Public Utilities Act and An Application for Approval of a Supply Agreement for Electricity Efficiency and Conservation Activities between EfficiencyOne and Nova Scotia Power Inc. and the establishment of a final agreement between the Parties, including approval of EfficiencyOne's 2019 Demand Side Management Resource Plan* [NSUARB Order], [July 23, 2018].

In 2019, EfficiencyOne will work with its Evaluation Consultant to design evaluations that will provide accurate results, keep to allocated evaluation budgets, and identify opportunities for continuous improvement. EfficiencyOne plans to continue conducting condensed evaluations for some program components in recognition of having reached a maturity level where key savings parameters have remained stable for several years. EfficiencyOne and its Evaluation Consultant will review the results of the 2018 evaluations and tailor 2019 evaluation activities accordingly; EfficiencyOne will only reduce activities where any potential risks can be reasonably minimized.

5.1 Residential Programs and Services

The 2018 Residential sector consists of the following programs:

- Residential Efficient Product Rebates;
- Existing Residential; and
- New Residential.

5.1.1 Residential Efficient Product Rebates

The Residential EPR program consists of the following components:

- Instant Savings; and
- Appliance Retirement.

Instant Savings

In 2019, EfficiencyOne will continue partnering with retailers across the province to offer point-of-sale rebates to retail customers for a variety of energy-efficient products. Rebates will be available during the spring and fall Instant Savings campaigns, as well as being offered year-round on select products. Online rebates will also be offered through participating retailer websites in 2019.

From January 1, 2019, A-series LED bulbs will no longer be offered through Instant Savings. This decision was informed by an Evaluator Recommendation made in 2017, reducing planned energy savings and investment for this program component in 2019, as well as incentive setting research conducted by EfficiencyOne in 2017 and 2018, in an effort to shift the market focus to include energy-efficient non-A series LED lamps and LED fixtures, as well as diversify EfficiencyOne's portfolio. EfficiencyOne will continue to investigate other energy-efficient technologies to add to Instant Savings and help homeowners and renters save on their electricity bills.

A number of marketing initiatives for Instant Savings are planned during 2019 including media and in-store advertising for the spring and fall Instant Savings campaigns, social media marketing, as well as features in ENS's *The Switch* Residential newsletter.

Appliance Retirement

In 2019, EfficiencyOne will focus on generating Appliance Retirement energy savings by continuing to offer the existing retirement and replacement services, and investigating opportunities to deliver new initiatives.

Planned marketing activities include direct mail, social media campaigns, topic features in ENS's *The Switch* Residential newsletter, cross-promotion through other EfficiencyOne program components, and in-store promotion of Appliance Retirement.

5.1.2 Existing Residential

The 2019 Existing Residential program comprises the following program components:

- Home Energy Assessment;
- Green Heat;
- Efficient Product Installation; and
- First Nations Home Energy Efficiency pilot.

1 These components provide services that are focused on whole-home (including
2 building envelope) retrofits, the direct installation of low-cost energy-efficient
3 technologies, and rebates for the installation of select energy-efficient technologies.

4 5 **Home Energy Assessment**

6
7 HEA is a well-established and successful whole-home energy-efficiency program
8 component. In 2019, assessments and incentives will continue to be provided for all
9 components of a home's building envelope, space-heating equipment, and water-
10 heating equipment.

11
12 2019 will also see the continuation of the EnerGuide Real Estate Listing pilot that
13 launched in 2017, which gives homeowners the option to have EnerGuide information
14 included with their home listing on the ViewPoint.ca real estate website.

15 Planned marketing efforts for HEA in 2019 include promotions at home shows, digital
16 marketing, social media campaigns and featured topics in ENS's *The Switch*
17 Residential newsletter.

18 19 **Green Heat**

20
21 Green Heat will continue to offer incentives for space and water heating systems in
22 2019, with ductless MSHPs anticipated to account for the majority of installations.
23 Green Heat will also continue to incent the adoption of hybrid heat-pump water
24 heaters as well as wood and pellet stoves, among other measures in 2019. In addition,
25 Green Heat will explore opportunities to add new measures to its offerings.

26
27 Marketing initiatives in 2019 will include in-store signage, more engagement with the
28 ETN, and digital and social media marketing strategies.

Efficient Product Installation

EfficiencyOne will continue to offer direct installation services to homeowners, renters, and landlords in 2019. EfficiencyOne will continue to develop strategies to achieve more savings per household, such as offering seasonal energy-efficient measures during installs, as well as continue to research other potential measures that could be offered through EPI.

EfficiencyOne will also engage in a variety of EPI marketing initiatives throughout 2019 utilizing digital and social media platforms, and features in ENS's *The Switch* Residential newsletter.

First Nations Home Energy Efficiency Pilot

In 2019, EfficiencyOne will continue to use DSM funds to support the First Nations Home Energy Efficiency pilot program that was launched in 2018 and seeks to deliver significant electrical energy savings to on-reserve, Band-owned homes.

Energy savings as a result of upgrades recommended in energy assessments that took place in 2018 are expected to be claimed in early 2019.

5.1.3 New Residential

In 2019, the New Residential program, marketed as NHC, will continue building relationships and further engaging with builders and contractors across the province to increase awareness of and participation in NHC, including a focus on increasing builder participation in the ETN in order to enhance communication and expand builder knowledge of NHC.

Marketing activities planned for NHC in 2019 include promotion through a variety of media platforms, attendance at trade-shows and other events, improvements to ENS's

1 *Building a New Home* guide, and case studies profiling NHC participants and
2 contractors.

3 4 **5.2 Business, Non-Profit and Institutional Programs and Services**

5
6 In 2019, the BNI sector will consist of the following programs:

- 7 • BNI Efficient Product Rebates;
- 8 • Custom Incentives; and
- 9 • Direct Installation.

10
11 In 2019, EfficiencyOne will continue its efforts to encourage businesses, non-profits,
12 and institutions to incorporate energy-efficient decisions into their activities. The OEM
13 initiative, which helps identify projects for Custom and other BNI offerings, will
14 continue in 2019. As in previous years, the OEM initiative will seek to recruit new
15 participants in a continued effort to develop energy management plans and facilitate
16 participation in EfficiencyOne programs.

17
18 BNI marketing efforts in 2019 will be targeted towards the following participant
19 groups:

- 20 • Industrials;
- 21 • Small Businesses;
- 22 • Commercial Buildings, both existing and new;
- 23 • Hospitality; and
- 24 • Retail.

25
26 The above participant groups represent large markets with significant energy savings
27 potential.

28
29 Marketing efforts spanning the BNI sector in 2019 include the following elements:

- 30 • integrated marketing campaigns across a variety of media such as print, direct
31 mail, digital and social media, and events and outreach;

- collaboration, development and maintenance of key partnerships with industry associations and the ETN in order to build relationships and educate on key technologies and program specifics; and
- continuing efforts to demonstrate the good things efficiency brings to businesses, with a focus on non-energy benefits.

5.2.1 BNI Efficient Product Rebates

Rebates will continue to be offered on energy-efficient products through the BER Mail-In and Instant Rebates services. BER rebates will continue to be refined and expanded upon where appropriate, with the discontinuation of specific lighting measures as well as some incentive level changes for other BER measures in 2019.

5.2.2 Custom Incentives

The Custom Incentives program comprises the following components:

- Custom;
- Energy Management Information Systems; and
- Strategic Energy Management.

In 2019, Custom Incentives will continue to support innovative projects that do not qualify for other programs.

Custom

Custom will continue to offer three separate services in 2019: Retrofit; Building Optimization; and New Construction. Custom will continue work on ongoing pilots during the year as well as reviewing results from pilots that took place in 2018.

Energy Management Information Systems

During 2019, EfficiencyOne will continue to support existing EMIS participants in the expansion of their energy management information systems and will continue efforts to recruit new participants. EfficiencyOne will also review current participants' operational controls and expand their opportunity for savings through additional controls, identification of new savings opportunities, and refinement of existing actions.

In addition, EfficiencyOne will continue to investigate the potential to offer a more flexible energy management approach encompassing elements of both EMIS and SEM to facilitate the varying needs of participants.

Strategic Energy Management

In 2019, EfficiencyOne will continue with a flexible approach for SEM participants, in contrast to the cohort model used prior to 2018. Participants will enroll in SEM on an individual basis and work one-on-one with the Service Provider, as well as participate in group training events with other SEM participants throughout the year, regardless of their stage in the program component.

5.2.3 Direct Installation

Throughout 2019, the Direct Installation program, marketed as SBES, will continue to provide small businesses in Nova Scotia with access to qualified contractors and to incent small businesses to complete energy-efficient upgrades in an effort to make them more viable and competitive. A variety of measures will continue to be included in SBES such as: lighting, building envelope, HVAC upgrades, compressed air, water heating, variable frequency drives, and upgrades to kitchen and laundry facilities.

Throughout the year, SBES will continue to expand support for non-lighting measures, emerging technologies, and vertical market specialties. The program will also continue to enable participants to find contractors through the ETN or to use a contractor of their choosing.

The SBES Affordable Multifamily Housing Pilot will focus on continuing to support existing participants in the implementation of energy-efficient upgrades recommended in the primary audit portion of the pilot and to conduct outreach to engage additional potential participants with the revised incentive structure that took effect in Q3 of 2018.

5.3 Enabling Strategies

Enabling Strategies will remain an important priority in 2019 and will include the following categories:

- Education and Outreach;
- Development and Research; and
- Other Enabling Strategies:
 - Capacity Building;
 - Working with Governments; and
 - Regulatory Affairs.

5.3.1 Education and Outreach

Education and Outreach strategies aim to foster a culture of energy efficiency throughout the province by creating awareness of and providing information about the value energy efficiency to stakeholders, partners, community groups, students, families and businesses. Activities in 2019 will include:

- continuing to engage Nova Scotians through social media (Facebook, Twitter, YouTube, LinkedIn, and Instagram) to drive awareness and create a culture of energy efficiency;

- ongoing enhancement of ENS's website to expand the availability of program information and materials, assistance and links to additional resources;
- distribution of electronic newsletters;
- advertising via a variety of media to increase awareness and understanding of the programs and services EfficiencyOne offers, with the objective of increasing participation in them;
- continuing to build the Green Schools program by increasing awareness of, and building energy efficiency into, the P-12 curriculum;
- working with post-secondary institutions to deliver energy efficiency courses;
- attending public speaking engagements and presentations on energy efficiency, as well as attending community events, home shows and trade shows;
- working with delivery agents, industry partners and educational institutions to develop, manage, and deliver education and outreach programs.

5.3.2 Development and Research

Key development and research activities planned for 2019 include:

- tracking quality assurance and participant satisfaction;
- tracking other attitudinal metrics among the general population of Nova Scotia households to help EfficiencyOne respond to changing market conditions;
- analysis of NS Power customer usage data to guide marketing initiatives and facilitate program design and delivery decisions with the goal of improving services and participant interactions;
- development of a demand reduction pilot, expected to encompass program components across both the Residential and BNI sectors; and
- continuing efforts to further inform the incentive setting process to ensure incentive levels are appropriate.

5.3.3 Other Enabling Strategies

In 2019, Other Enabling Strategies will focus on:

- Capacity Building;
- Working with Governments; and
- Regulatory Affairs.

Capacity Building

In 2019, EfficiencyOne will focus efforts on capacity building in Nova Scotia by enhancing existing training and quality assurance for Delivery Agents and building industry capacity through its ETN.

Throughout 2019, EfficiencyOne will continue to support and grow the energy efficiency industry in Nova Scotia and build on the successes of the ETN by:

- hosting EfficiencyOne's annual Bright Business Conference & Awards in October 2019;
- coordinating ETN member discounts for training courses, workshops, and conferences offered by industry partners;
- offering Energy Advisor exam preparation courses to help meet the demand for workers in this field;
- continuing to provide communications to ETN members through ENS's *The Network News* bi-monthly newsletter;
- providing advance notice of upcoming EfficiencyOne procurement opportunities on the EfficiencyOne website and in ENS's *The Network News*; and
- hosting training and information sessions (e.g. webinars, in-person events, and pre-recorded videos) for ETN members on topics including EfficiencyOne's Procurement process as well as EfficiencyOne program offerings and program changes (e.g., incentive changes or application process changes).

Working with Governments

EfficiencyOne seeks to drive market transformation by working with governments to promote the adoption of energy-efficiency measures through government initiatives, including implementing codes and standards.

In 2019, EfficiencyOne plans to continue supporting the development of energy efficiency standards and regulations by:

- actively participating in the CSA's SRTF and SCOPEER committees;
- supporting the provincial government in introducing new codes and regulations including in two key technology demonstration pilots scheduled to be operationalized in 2019. These pilots are not funded by DSM investment, but are expected to provide valuable technology insights that will be applicable to ratepayer-funded DSM; and
- providing expertise and market data to provincial and federal governments where appropriate.

EfficiencyOne will also work with its Evaluation Consultant again in 2019 to establish an appropriate scope for the Codes and Standards evaluation.

Regulatory Affairs

Regulatory Affairs activities in 2019 will include:

- negotiating the 2020-2022 DSM Resource Plan with NS Power and gaining stakeholder and NSUARB approval of the same;
- reporting to the NSUARB and stakeholders on EfficiencyOne topics, including:
 - 2018 DSM Annual Progress Report;
 - 2018 Evaluation Reports;
 - 2019 Quarterly Reports;
 - 2018 Audited Financial Statements;
 - 2019 Code of Conduct Compliance Report;

- 1 ○ DSM Potential Study;
- 2 ○ locational DSM efforts, in collaboration with NS Power (see section 3.1 for
- 3 more information);
- 4 ○ the 2019 Historical-looking Rate and Bill Impact Analysis;
- 5 ○ updates on EfficiencyOne's Non-Energy Benefits Application; and
- 6 ○ evaluation and verification recommendation updates.
- 7 • hosting DSM Advisory Group meetings to discuss ongoing initiatives, as
- 8 appropriate; and
- 9 • working with the Evaluation and Verification Consultant to facilitate their
- 10 efforts.

6 HST UPDATE

ENS Transition Corporation (“ENS”) was successful in its appeal of an Excise Tax Act assessment by the Minister of National Revenue for investment tax credits (ITC’s) for the period May 1, 2010 to January 31, 2015. This successful appeal resulted in ENS recovering \$14,123,207.10 in harmonized sales tax (“HST”) together with accrued interest of \$895,164.50 for a total refund amount of \$15,018,371.60 (“HST Refund”). This amount was received on September 12, 2018.

These funds have been invested in a short-term GIC bearing annual interest of 2.65 percent. Disposition of the HST refund and interest is expected to be discussed as part of the regulatory process for the 2020-2022 DSM Resource Plan filed by EfficiencyOne on February 28, 2019.

1 **7 CONCLUSION**

2

3 EfficiencyOne is pleased to submit this Annual Progress Report on its 2018 DSM
4 performance, as well as its 2016-2018 DSM Plan performance. As of this writing,
5 EfficiencyOne expects to meet its 2019 planned savings, while continuing to provide
6 DSM programs and services that meet a wide variety of participants' needs.
7 EfficiencyOne looks forward to the opportunity to respond to questions on this report
8 and to continue updating the NSUARB and stakeholders on its progress throughout
9 the remainder of the year.

ATTACHMENT 1

EVALUATOR AND VERIFIER RECOMMENDATION UPDATES

Table 1: Update on Implementation of 2013-2016 Evaluation Recommendations

Table 2: Update on Implementation of 2013-2016 Verification Recommendations

Table 3: Update on Implementation of 2017 Evaluation Recommendations

Table 4: Update on Implementation of 2017 Verification Recommendations

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	Continue to work on including as much information as possible in standardized database format: In 2013, more information was available on the DSMDS in the form of automated reports. In order to facilitate savings tracking and future evaluation activities, ENSC should continue to work on including all necessary information in the DSMDS in the form of standardized entries. This includes technical specifications of equipment, answers to pre-screening questions and savings equations.	OV-R6	In Progress	E1 agrees with this recommendation. E1 continued implementing the new DSM data tracking system and worked with the vendor to mitigate risks associated with delays that occurred in 2017 due to vendor development issues. E1 contracted an external expert in 2018 and several governance and process improvements were identified as part of a remediation plan. E1 worked with the vendor throughout 2018 to implement identified remediation plan activities and to update the project plan. This system will improve customer experience and create efficiencies for program delivery through improved and standardized tracking and reporting processes.	2020
2013	Evaluation	Evaluate the benefits/costs in acquiring a Customer Relations Management (CRM): This type of system could be a key tool for ensuring effective data collection (customer, loyalty, segmentation, benchmarking/competitive, etc.) and evidence-based decision-making.	TPE-R3	In Progress	E1 agrees with this recommendation. The CRM tool is a key component of the DSM data tracking system. E1 is currently determining when the CRM tool will be fully functional.	2019
2013	Evaluation	Adapt the tracking system (DSMDS) to the QA program: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	E1 agrees with this recommendation. After all program components have been implemented in the DSM data tracking system, E1 will consider the cost and scope of work involved in integrating QA activities into the DSM data tracking system.	To be considered in a future year

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	Adapt the next tracking system (DSMDS) to the QA program: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	E1 agrees with this recommendation. After all program components have been implemented in the DSM data tracking system, E1 will consider the cost and scope of work involved in integrating QA activities into the DSM data tracking system.	To be considered in a future year
2014	Evaluation	Adapt the tracking system (DSMDS) to the QA program: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	E1 agrees with this recommendation. After all program components have been implemented in the DSM data tracking system, E1 will consider the cost and scope of work involved in integrating QA activities into the DSM data tracking system.	To be considered in a future year
2014	Evaluation	Gather more data to conduct a conclusive calibration billing analysis in 2015. Despite the fact that 23 projects were completed in 2012 and 2013, it was only possible to obtain sufficient energy billing data for seven projects to perform a calibration analysis in 2014. This calibration analysis proved to be inconclusive due to numerous factors. The Evaluator consequently suggests that this evaluation activity be continued in future evaluation. Other measures could be taken to ensure the quality of the result, such as requiring a final energy simulation submission (based on the as-built conditions), making enhanced building commissioning a mandatory element of Custom NC and/or including a full energy simulation review to ensure the accuracy of the model inputs.	Custom NC-R1	Deferred	E1 appreciates this recommendation. Peak demand savings are collected from completed energy models. In 2019, E1 will further investigate the use of Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist E1 in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Evaluation	Adapt the next tracking system (DSMDS) to the QA program: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	E1 agrees with this recommendation. After all program components have been implemented in the DSM data tracking system, E1 will consider the cost and scope of work involved in integrating QA activities into the DSM data tracking system.	To be considered in a future year
2015	Evaluation	Continue working towards the standardization of measurement and verification (M&V) procedures for Custom Retrofit. ENS is currently developing tools to improve the quality of the M&V activities carried out for Custom Retrofit. The Evaluator believes that those efforts should be maintained, as the lack of consistency and the at times incomplete documentation of M&V are the main weaknesses of Custom Retrofit. In particular, the M&V strategy should be worked out with the participant and included in the Project Development Agreement (PDA), and all documentation relevant to the calculation of savings should be stored on the demand-side management data system (DSMDS).	Custom-R2	Complete	E1 agrees with this recommendation, which has been implemented. E1 has standardized its M&V policy. Documentation regarding calculation of savings is now stored on the Dynamic DSM. An updated PDA was launched in early 2018 that outlines the planned M&V activities for all new projects. The updated PDA includes the selected International Performance Measurement and Verification Protocol (IPMVP), the personnel responsible for conducting M&V, when pre and post M&V will occur, the key variables to be considered for M&V, and the equipment required to perform M&V.	2018

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Evaluation	Further improve the tracking system. The Evaluator commends ENS for the significant improvements that have been made to the BER Mail-in and Instant Rebates tracking systems in the last two years. Nevertheless, some potential improvements were identified again this year. In BER Mail-in, it was found that the project's total savings were sometimes not linked to the individual measure savings. The Evaluator also noticed, in a few cases, discrepancies between the calculation algorithms, the variable descriptions and the savings calculated for the same measure. For BER Instant Rebates, the most significant potential improvement would be to update the evaluation category field to match the categories used in the 2015 evaluation.	BER-R2	Complete	E1 agrees with this recommendation. In 2018 BER Mail-in measure savings were properly linked to total project savings. E1 also performed a second review of completed BER Mail-in projects to ensure the proper evaluation category was listed in the tracking sheet. In BER Instant Rebates, each measure has been attached to a specific measure category that matches the most recent evaluation. In the 2018 evaluation, only a 2% adjustment ratio was applied to the tracking sheet.	2018
2016	Evaluation	Increase program component advertising to households and collaborate with retailers. Evaluation results showed fairly high free-ridership levels for products rebated through Green Heat, especially for heat pumps and MSHPs. The Evaluator recommends focusing marketing efforts on (1) better communicating with households, and (2) collaborating with retailers. Advertising the program component more effectively to households could contribute to lowering the free-ridership level by reaching out to homeowners who have not yet decided to replace or supplement their equipment with heat pump, solar or biomass units. Indeed, many surveyed participants conceded that they had already made the decision to install a high-efficiency system before learning about Green Heat. For homeowners who have already decided to change their heating system, retailers could encourage them to choose the most efficient product by offering the necessary information to customers. However, both lack of point-of-sale material and retailer training result in retailers poorly understanding Green Heat. The Evaluator suggests increasing program component knowledge among retailers by providing them with an impetus to more actively promote higher efficiency models, and offering point of sale promotional material. ENS could request retailer inputs about which equipment to promote to achieve energy savings that would not occur otherwise.	GH-R2	Complete	E1 agrees with this recommendation, which has been implemented. In 2018, E1 advertised in major retailer flyers, digital ads on Facebook, radio ads, articles and print. E1 continued retailer outreach in 2018, results from the 2018 evaluation indicate that 74% of surveyed participating households has seen E1 promotional materials. Specifically, in 2018 E1 continued to promote Green Heat with retailers through in store posters, tent cards, decals and application forms. E1 staff also performed in store presentations about the Green Heat program.	2018

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Evaluation	Identify the root causes of New Construction's low participation. Although the ongoing slowdown in Nova Scotia's construction industry is beyond ENS's control, the Evaluator still considers it necessary to properly examine and analyze the causes leading to New Construction's low participation level. Since only two participants were interviewed for this evaluation, the Evaluator cannot provide insightful conclusions about the barriers encountered by participants. Interviewing a larger group of participants and, even more importantly, non-participants could provide useful information and insights on how to make New Construction more attractive to more potential participants. These interviews could be conducted as part of the 2017 evaluation.	Custom-R2	Complete	E1 agrees with this recommendation, which has been implemented. E1 relaunched the New Construction service in Q2 of 2017. The New Construction service average 3 new projects per quarter prior to the relaunch of the service. In 2018 the participation average has increased to 7 projects per quarter. The evaluator conducted a process evaluation on Custom's New Construction service in 2018. Recommendations to increase participation that resulted from the process evaluation will be considered by E1 and implemented in 2019, if determined feasible. E1 will continue to monitor feedback from consultants and participants, and adjust the service as necessary.	2018
2016	Evaluation	Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of EMIS activities. When participants continued taking part in EMIS for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to EMIS, this methodology might be refined to capture all incremental savings.	EMIS-R3	In Progress	E1 agrees with this recommendation and took steps in 2018 to build the required internal resources to rebaseline continuing participants. The steps taken included hosting a internal training session, developed and delivered by the evaluator, on rebaselining methodology for EMIS and SEM projects.	2019

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Evaluation	Track major changes to facility operations and equipment and adjust energy baseline consumption as required. The Evaluator identified one project for which the compressed air system had been replaced as part of a Custom Retrofit project in 2016. This modified the baseline energy consumption of the plant and resulted in double-counting savings. The Evaluator made this adjustment, but did not have sufficient data to update the baseline regression; new data should be gathered to update this baseline energy regression in 2017. To avoid this in the future, systematic reviews of facility operational and equipment changes should be implemented by ENS to ensure the accuracy of reported savings.	EMIS-R5	Complete	E1 agrees with this recommendation, which has been implemented. E1 continues to discuss data requirements with the Evaluator and integrate new participant reporting requirements into the program component. E1 now includes an event log which provides details on major changes that occurred in facilities.	2018
2016	Evaluation	Continue to support SEM and identify potential new participants. Participants value the support they receive from their service provider and ENS. Also, SEM participants generated high energy savings in their first year of participation. The success of SEM could be expanded if the program component were able to identify more potential participants.	SEM-R1	Complete	E1 agrees with this recommendation, which has been implemented. Four new participants enrolled in SEM in 2018. E1 program staff and the Business Development team continue to actively recruit SEM participants.	2018
2016	Evaluation	Continue encouraging SEM participants to enroll in EMIS and strengthen integration between the two program components. There is a natural connection between EMIS and SEM. SEM aims to change the culture of an organization in terms of how they view and manage energy. EMIS provides infrastructure and technical support to identify operational and process savings. Many organizations participating in one program component would benefit from the services offered by the other. It is also believed that participation in both EMIS and SEM would increase participant internal energy management capabilities and commitment, thereby helping achieve deeper and more sustainable savings.	SEM-R2	Complete	E1 agrees with this recommendation and has worked with past SEM participants to complete EMIS assessments. E1 also encourages continuing EMIS participants to participate in SEM. Participants are able to transition from one program to the other.	2018

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Evaluation	Consider extending the SEM cycle to engage participants for a longer period of time. The service provider suggested having longer periods of participation in SEM, and participant feedback suggests that having participants engage with the service provider for a longer period of time may yield additional savings and help further institutionalize energy management in the culture of participating firms. This has been common in other SEM programs in North America.	SEM-R3	Deferred	E1 does not have all the information needed to perform a full analysis of the cost effectiveness of extending the SEM cycle over a two-year period. Once the savings persistency of SEM projects is measured or estimated with sufficient accuracy, E1 will reconsider this recommendation.	To be considered in a future year
2016	Evaluation	Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of SEM activities. When participants continued taking part in SEM for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to SEM, this methodology might be refined to capture all incremental savings.	SEM-R4	Complete	E1 agrees with this recommendation, which has been implemented. In 2018, all savings for SEM are tracked as incremental first-year savings. E1 has put in place a procedure to track incremental savings for any future participants that take part in SEM for more than one year. SEM participants continuing in 2019 will be rebaselined to only account for incremental energy savings in years subsequent to first year of participation. E1 hosted a training session in 2018, delivered by the evaluator, on rebaselining methodology for EMIS and SEM projects.	2018

Table 1
Update on Implementation of 2013-2016 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Evaluation	Improve the identification of event types in the Event Log. The Event Log is a valuable tool for conducting the SEM impact evaluation and it generally contains more information this year than in 2015. However, the Evaluator found that the event categories suggested in the document were not specific enough; for instance, there should be different categories for elements impacting the baseline and the energy efficiency measures implemented, rather than categorizing them all as operational changes.	SEM-R5	Complete	E1 agrees with this recommendation, which has been implemented. E1 has created a new event log template for SEM participants. The event log identifies changes, such as the removal or addition of measures, variations in production levels, and crossover participation. The new event log will provide a greater level of detail on the actions implemented in a facility and will improve the accuracy of savings calculations.	2018
2016	Evaluation	Identify energy efficiency measures installed under ENS instant rebate programs. During the project review, the Evaluator identified several projects for which products were most likely bought with a point-of-sale rebate, but could not find evidence to confirm this. To avoid counting savings twice, it is suggested that SEM participants be asked to provide invoices of energy efficient products bought under ENS instant rebate programs.	SEM-R6	Complete	E1 agrees with this recommendation, which has been implemented. E1 now provides the evaluator an event log now that identifies changes, such as the removal or addition of measures, variations in production levels, and crossover participation. The addition of crossover participation (i.e. participation in other ENS program components) as an event type addresses this recommendation by identifying energy efficiency measures installed under other ENS programs.	2018
2016	Evaluation	Apply the adjustments made to the baseline energy regression in the 2016 evaluation to continuing participants. Two of the three continuing projects from 2015 had their baseline energy regression adjusted under the 2015 impact evaluation. These adjustments were still valid for the 2016 evaluation, but were not carried out by the service provider. Therefore, the Evaluator recommends that the project-specific adjustments made in this evaluation be applied to continuing projects going forward.	SEM-R7	Not Recommended for Action	E1 appreciates this recommendation, this recommendation could not be implemented as it relates to 2016 continuing participants and no continuing participants took part in SEM in 2017 or 2018.	N/A
2016	Evaluation	Consider working with auditors to make the process of developing cost estimates less burdensome for auditors, contractors, and distributors. Currently, the audit path requires auditors to obtain new cost estimates for each project. Auditors call distributors and contractors who then voluntarily provide bids for the identified measures of a project. These contractors and distributors are unlikely to obtain the project simply because the auditor contacted them, partly because the auditor cannot recommend these contractors to participants. To address this issue, ENS could meet with auditors to discuss alternative methods for estimating costs.	SBES-R3	In-Progress	E1 agrees with this recommendation and has created an average measure cost price list which contains all current SBES measure offerings. The price list was created from historic SBES audit measure prices, which includes a variety of different brands or options for each measure. E1 will incorporate the average measure cost price list into the Energy Auditor report template and the Opportunity report template. This ensures that the process for developing cost estimates is less burdensome for auditors and contractors.	2019

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Verification	Develop evaluation guidelines. A separate document from a TRM is a set of evaluation guidelines covering methods, practice and reporting. The New York evaluation guidelines and appendices could be reviewed and modified to form an initial document. This would set certain evaluation standards for future evaluations.	Savings Verification Recommendation No. 3	In Progress	E1 agrees with this recommendation and is developing evaluation guidelines to specify its approach and expectations for future evaluations.	2019
2014	Verification	Calibration for Custom New Construction. Structure project monitoring to gather more data to conduct a conclusive calibration billing analysis in 2015 and develop the diversity factor used in peak demand savings by building it up from an individual measure basis.	Savings Verification Recommendation No. 17	Deferred	E1 appreciates this recommendation. Peak demand savings are now collected from completed energy models. In 2019, E1 will further investigate the use of Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist E1 in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year
2015	Verification	Provide additional or reinforcement health and safety issue training, including mold problems and fiberglass precautions to all HEA field staff.	SV-9 (HEA)	Complete	E1 agrees with this recommendation, which has been implemented. A review of best practice procedures when dealing with mold and fiberglass precautions was delivered to all HEA service organizations on June 20, 2018, as part of a half day training session/meeting on new program launch.	2018

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Verification	Maintain and enhance the EMIS savings by adopting SEM program elements with the EMIS technology. For the EMIS program, multi-year evaluated savings increases for this technology can be expected based on continual improvements in facility savings due to increased information and control. Some studies show a continual increase in annual savings for several years. A follow up analysis of second and third-year facility savings, in absence of other program activities, should be performed on these projects and attributed to program savings through the 'milestone' achievements tab for the project. Follow up analysis should also address the level of ongoing support and commitment to SEM at the plant and company level.	SV-20 (EMIS)	In Progress	E1 agrees with this recommendation. The existing EMIS program component requires participants to not only install sub-metering infrastructure, but also to integrate the management of energy into an existing management processes, and draw on a lot of the organizational elements of SEM. EMIS incremental savings are evaluated on an annual basis for participants who continue to participate in the program component over a multi-year period. For SEM, E1 is currently working with a new service provider and will evaluate each participants' requirements for continued support beyond year one. E1 has engaged with past SEM participants, resulting in further interest in the EMIS program.	2019

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Verification	In future years, ENS should specify rules to bound the dropping of evaluation components and to bound the reduction of program impact evaluations. There should be a systematic understanding and articulation of risks to evaluations producing usable and defensible knowledge. For example, a rule could be that impact evaluation for a program will be reduced no more frequently than every other year. Or that process evaluations will skip more than two years in a row. It is quite possible to do some trade-offs to conserve dollars, with the approval of the Advisory Group. But these kinds of trade-offs need to be carefully watched and rules set up to protect the continuing validity and precision of evaluation results.	Recommendation General-SV-4	In Progress	E1 agrees with this recommendation. E1 has now completed its first full year of condensed evaluations and expects to refine its approach to reducing evaluation activities based on this experience. It is working with the Evaluator to develop a set of guidelines to ensure consistent and transparent evaluation planning and expects to finalize guidelines in 2019 that take into account lessons learned during the 2018 evaluation process.	2019
2016	Verification	For program types that permit, ENS and the Advisory Group should consider the potential benefits and costs of introducing selected persistence evaluations to empirically document lifetimes and persistence of savings.	Consideration General-SV-2	Not Recommended for Action	E1 appreciates this consideration but does not recommend pursuing it at this time. The Evaluator reviewed Effective Useful Lives (EULs) and lifetime savings for the first time in 2017. E1 and the Evaluator plan to continue refinement of the current savings persistence methodology.	N/A
2016	Verification	ENS and the Advisory Group should consider initiating discussion with the province and climate adaptation advocates of the intersection between DSM and climate adaptation, particularly in new construction.	Consideration General-SV-5	Not Recommended for Action	E1 appreciates this consideration. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, E1 would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Verification	ENS should consider meeting with the appropriate provincial agency and environmental advocates to discuss the evolving intersection of DSM with climate adaptation, particularly for new construction and major renovation projects such as Net Zero and Passivhaus projects.	New Home Construction-SV-R1	Not Recommended for Action	E1 appreciates this recommendation. At this time, however, it is E1's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and E1. Upon being given direction from the UARB, E1 would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
2016	Verification	ENS should consider meeting with the appropriate provincial agency and with climate adaptation advocates to explore the evolving overlap of DSM and climate adaptation and to develop a list of climate adaptation criteria for new construction and major renovation projects.	Custom-SV-R1	Not Recommended for Action	E1 appreciates this recommendation. At this time, however, it is E1's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and E1. Upon being given direction from the UARB, E1 would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
2016	Verification	We agree with the Service Provider recommendation of greater coordination between the EMIS and SEM program. Further, we recommend that ENS consider merging the two programs into a single customer offer. While there are unique attributes of each that would need to be considered when combining SEM and EMIS, other utilities offer a single program for both.	EMIS-SV-1	In Progress	E1 agrees with this recommendation and continues to encourage cross-participation in EMIS and SEM. E1 has identified past EMIS and SEM participants who have expressed interest in the other program component for 2018. E1 is working with these participants to meet their needs. E1 continues to explore the option of merging the two offerings.	2019

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Verification	Add the following SEM related terms to the Definitions (p. iii); Baseline regression, Projected baseline, Adjusted baseline, Cumulative SEM/EMIS savings, Incremental SEM/EMIS savings. The SEM/EMIS definitions for cumulative and incremental savings should reference the relationship between reported energy usage and the projected baseline.	SEM-SV-R1	Complete	E1 agrees with this recommendation, which has been implemented. The Evaluator has defined all relevant terms in the 2018 SEM evaluation report.	2018
2016	Verification	We support the Service Provider recommendation of a longer engagement with SEM participants.	SEM-SV-R2	Deferred	E1 does not have all the information needed to perform a full analysis of the cost effectiveness of extending the SEM cycle over a two-year period. Once the savings persistency of SEM projects is measured or estimated with sufficient accuracy, E1 will reconsider this recommendation.	To be considered in a future year
2016	Verification	One way to more clearly communicate the approach is to show the results for each step and each project. Having a table with columns for 2016 Projected baseline, Adjustments, Adjusted baseline, Actual energy usage and Incremental savings would more clearly show the methodology and results. More columns may be required to show certain details such as the adjustment for savings from other ECM programs. Presumably such a table would also make clear how the value of 0.463 "Adjustment Ratio for Energy Savings" was calculated.	SEM-SV-R3	In Progress	E1 agrees with this recommendation. SEM did not achieve savings in 2017 and therefore, the Evaluator did not write a 2017 SEM evaluation report. The Evaluator will consider how to refine the presentation of SEM data in the 2018 SEM evaluation report.	2019

Table 2
Update on Implementation of 2013-2016 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2016	Verification	For future evaluations, please systematically address what savings would have resulted naturally via Naturally Occurring Market Adoption Factors (NOMADs) for each MEP, and decrease impacts by those amounts for each MEP.	SV-MEPS-1	Not Recommended for Action	E1 appreciates this recommendation but notes that influencing codes and standards (also known as Minimum Energy Performance Standards (MEPs)) is not a primary focus for E1. E1 reports on these energy savings for informational purposes only, but does not claim them. Because of this, and as pursuing this recommendation would have a significant impact on the evaluation budget, E1 does not suggest pursuing this recommendation at this time.	N/A
2016	Verification	In the next evaluation, the evaluator should carry out the attribution step for each MEP.	SV-MEPS-2	Not Recommended for Action	E1 appreciates this recommendation but notes that when new codes and standards come into effect, E1 does not provide incentives for these measures because its influence is not required to achieve savings. Additionally, without significant E1 resources going toward influencing new codes and standards, E1 expects that savings attributable to E1 would be minimal. Because of this, and as pursuing this recommendation would have a significant impact on the Codes & Standards evaluation budget, E1 does not suggest pursuing this recommendation at this time.	N/A

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Foster the implementation of non-lighting energy efficiency measures. Among the wide variety of energy efficiency measures offered by ENS, lighting measures accounted for most savings achieved in 2017. For example, Instant Savings, Efficient Product Installation, and Business Energy Rebates, which together represent 64 percent of ENS energy savings in 2017, generated most of their energy savings through lighting measures (89% for Instant Savings, 67% for Efficient Product Installation and 86% for Business Energy Rebates). Additionally, the Evaluator analyzed the market evolution of LED lighting and concluded that market barriers are decreasing. Consequently, the Evaluator predicts that the baseline efficiency for lighting will continue to increase and thus reduce savings. ENS offers many non-lighting measures in its portfolio. The Evaluator believes there is potential for achieving more energy and peak demand savings from non-lighting measures and recommends that ENS look for new ways to encourage their implementation. This represents an opportunity for ENS to increase energy and peak demand savings while mitigating the risk of declining lighting energy and peak demand savings.	2017 CR-R1	In Progress	E1 agrees with this recommendation. The Evaluator conducted market and process evaluation activities on this theme in 2018. E1 has actively pursued non-lighting projects and measures in 2018. E1 will continue to foster the implementation of non-lighting energy efficiency measures in 2019.	2019
Continue to perform the metering activity to increase sample sizes. This year, the Evaluator developed a new metering protocol, which greatly improved the quality of the metering data. Although the metering approach used in 2017 was improved, the sample sizes were not large enough to provide acceptable margins of error on gross energy consumption values. Therefore, the Evaluator recommends continuing the metering activity in 2018 using the same age categories and the same protocol as used in 2017 to increase the sample size of each age category. As for the metering activity to be performed next year, the Evaluator also suggests implementing some minor changes, such as using a better tool to measure the power factor of each appliance type and measuring old appliances' inside temperature at the time of pick-up, as recommended in the Metering Review section of this report.	2017 ARet-R1	Complete	E1 agrees with this recommendation. E1 performed appliance metering in 2018 and implemented changes to the metering protocol as suggested by the Evaluator. E1 worked with the Evaluator to establish sample sizes that would result in reasonable margins of error. The Power Factor (PF) is now measured during the entire metering period and a heat gun is used to measure appliance internal temperatures at the time of pick up.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Improve the process for tracking appliances retired through the pilot. This year, the savings of those appliances retired through the ARet pilot were tracked using the same parameters and methodology as for full-sized residential appliances. After conducting an interview with a representative of HRSB schools, the Evaluator used different unitary gross and net savings values for the pilot. Going forward, the Evaluator recommends using the unitary savings values established in this year's evaluation for appliances retired through the pilot. The Evaluator also recommends improving the tracking process by clearly identifying the appliances retired through the pilot.	2017 ARet-R2	Complete	ENS agrees with this recommendation, which was implemented.	2018
Continue providing program component support to expand the share of LED bulbs in the Nova Scotia residential lighting market while beginning to plan an exit strategy for A-type bulbs. Given the high participation level in this program component, high purchase volume of A-type bulbs and reductions in LED prices, ENS should consider decreasing incentive levels for A-type bulbs. In addition, ENS should consider possible opportunities for shifting the focus of the program component, for example to bulb types with lower market adoption, to extend Instant Savings beyond the short-term.	2017 Instant-R1	Complete	E1 agrees with this recommendation, which was implemented. As of January 1, 2019, E1 has removed LED A-type lamps from the Instant Savings program component.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Continue monitoring market indicators and collect additional information to further characterize the LED market. Because the lighting market is in a period of change, the Evaluator recommends continuing to monitor market indicators such as market share of lighting technologies, socket saturation and LED prices. Also, to better characterize the current state of the lighting market, the Evaluator recommends collecting data about the following aspects: (1) Different LED and halogen bulb types installed in homes. This information could be collected during site visits in future socket studies; and (2) Customer knowledge of LEDs. This information could be collected using questions included in a periodic Omnibus survey. An Omnibus survey is a cost-effective method where data on a wide variety of subjects is collected during the same interview.	2017 Instant-R2	Complete	E1 agrees with this recommendation, which was implemented.	2018
Review the current incentive structure to look for possible ways to simplify it. EAs and participants alike consider rebate calculations complicated. Knowing that ENS has already begun reviewing the incentive structure to make necessary changes, the Evaluator recommends continuing this effort while trying to make this structure as simple and straightforward as possible for both EAs and participants.	2017 HEA-R1	Complete	E1 agrees with this recommendation, which was implemented.	2018
Conduct a billing analysis to review the overestimation ratio. The Evaluator has found that a new version of HOT2000 was used to calculate savings for 9 percent of HEA participants. The Evaluator predicts that this proportion will probably increase in 2018. The Evaluator recommends conducting a new billing analysis in the next evaluation to establish an overestimation ratio specific to the new version of HOT2000 for HEA.	2017 HEA-R2	Complete	E1 agrees with this recommendation, which was implemented. A HOT2000 billing calibration (referred to as billing analysis in the 2017 HEA-R2 recommendation) has been performed by the Evaluator in 2018. The billing calibration provides an overestimation ratio to be applied to the new version (version 11) and old version (version 10) of HOT2000 models and differs depending on the presence or absence of heat pumps.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Perform the ASHP billing analysis again in 2018. Similar to MSHPs, the billing analysis resulted in a major change made to the average savings values for ASHPs. As part of this analysis, participants were categorized based on their existing heating system type. Because of the small sample sizes for each category, it was difficult to establish distinct savings for each category. The Evaluator believes that the ASHP billing analysis should be conducted again in 2018 to obtain a larger sample of participants and improve the accuracy of savings.	2017 GH-R1	Complete	E1 agrees with this recommendation, which was implemented. The Evaluator performed an ASHP billing analysis in 2018. The analysis includes all participants for which a full heating season of data was available post-participation.	2018
Conduct a survey with a larger sample of participants who installed MSHPs in non electrically heated households. As part of the 2017 evaluation, a participant survey was conducted to establish the baseline scenario for MSHPs installed in previously non electrically heated households. Unfortunately, the sample size was small because a low number of participants had installed MSHPs in non-electrically heated households at the time of the survey. The Evaluator believes that a survey with participants living in non electrically heated households should be conducted again in 2018 to determine the most appropriate baseline scenario to be used for such participants. This survey should ask participants about Green Heat's influence on their decision to purchase an MSHP and how this impacted the timing of their decision. Since MSHPs installed in non electrically heated households generated lower savings, this feedback could provide more insight on whether the inclusion of this measure in Green Heat should be reconsidered.	2017 GH-R2	Not Recommended for Action	Not Recommended for Action.	N/A

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Improve the collection of technical information about ASHPs. Peak demand savings for ASHPs are based on technical information such as heating capacity and the coefficient of performance at a temperature of -15°C. In 2015, the Evaluator was able to locate technical information on 15 ASHP models and established an average unitary peak demand savings value of 3.04 kW. Although it was recommended in the 2015 evaluation report that ENS start collecting performance data about ASHPs at -15°C, such information is still not tracked by ENS. In the absence of more accurate performance data, the unitary savings value of 3.04 kW is still used. Considering the fact that the number of ASHPs installed through Green Heat has significantly increased in the past two years (from 52 in 2015 to 143 in 2017), the Evaluator reiterates the recommendation to start tracking ASHP performance data at -15°C to increase the accuracy of the peak demand savings calculations.	2017 GH-R3	In Progress	E1 agrees with this recommendation. Northeast Energy Efficiency Partnerships (NEEP) manages a Cold Climate ASHP Specification list. ENS is planning to adopt the NEEP specification requirements once the Cold Climate list is publically available. If E1 chooses to adopt the NEEP specification list, the Evaluator will be able to determine peak demand savings for all models.	2019
Gather additional information to further characterize the MSHP market. While the market indicators presented in the Market Evolution section of this report provide some indication of the evolution of the market for MSHPs, certain key data points were unavailable or rely on information from participating contractors. As a result, the Evaluator was unable to formulate a clear conclusion on the current state of the MSHP market in Nova Scotia. Additional data should be collected in 2018, such as: › Market share of efficient MSHPs in Nova Scotia from a broader data set, including market share of secondary systems › Minimum efficiency levels of units sold by contractors › Data on the incremental cost difference between standard versus high-efficiency MSHPs and Green Heat eligible MSHPs.	2017 GH-R4	Complete	E1 agrees with this recommendation, which was implemented. The Evaluator performed a market evolution analysis of MSHPs in 2018, to further characterize the MSHP market. The Evaluator updated the Market Evolution section from the 2017 Evaluation Report with new data for the 2018 Evaluation Report. The Evaluator interviewed six major distributors of heat pumps in Nova Scotia to determine sales and types of heat pumps sold. As part of this analysis, the Evaluator gathered data (secondary data through manufacturer associations and import data) and used assumptions from the 2018 Nova Scotia Power load forecast.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Develop a way for potential participants to better understand which ASHP equipment is eligible. Non-MSHP participants do not have a simple list of rebated equipment to choose from and therefore must rely on contractors to determine if equipment is eligible. To drive interest in non-MSHP measures, such as ASHPs, and prevent dissatisfied participants who purchased equipment thinking it was eligible for a rebate, ENS should develop a list of eligible equipment, similar to the list established for MSHPs. Contractors could be asked to develop and update this list.	2017 GH-R5	In Progress	E1 agrees with this recommendation. This recommendation is tied to recommendation 2017 GH-R3. Once E1 has determined if it will adopt the Northeast Energy Efficiency Partnerships' specification criteria, an approved list similar to the one for MSHPs will be created.	2019
Document the energy-saving potential related to halogen incandescents and CFL lamp replacements. The tracking report indicated that the average number of A-type LED lamps installed per household significantly decreased among participating single family homes. Although EPI achieved high savings in 2017, this trend suggests that fewer incandescents are present in homes, and will consequently provide fewer opportunities for LED replacements in the future. The Evaluator recommends that ENS start gathering information about the types of lamps installed in EPI participants' homes to analyze the savings potential that can be tapped if general-service lamp types other than incandescents are made eligible for replacement.	2017 EPI-R1	In Progress	E1 agrees with this recommendation. E1 requested service providers track halogen incandescent lamps that are already installed in participants' homes. The service providers reported finding no halogen incandescent lamps in participant homes. E1 will continue to work with service providers to document the energy savings potential related to halogen incandescent lamp replacements in 2019.	2019

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Conduct a process evaluation for NHC in 2018. During the 2017 evaluation, participants and builders made certain criticisms about NHC, especially on incentive levels and the participation process. Also, the NHC participation level continued to decrease. In light of these findings and the substantial changes made to NHC in 2017, the Evaluator recommends conducting a process evaluation of NHC next year to determine if current program component processes, parameters and model of delivery are optimized to meet market needs. The process evaluation's scope could include a benchmarking study of other Canadian or North American jurisdictions to compare NHC to other similar programs, and an in depth consultation with builders and other key actors involved in the residential new construction market to find the most effective ways to generate more projects through a simple and straightforward participation process. Market data should also be collected to obtain insights about market forces that may be influencing the decline in NHC participation.	2017 NHC-R1	Complete	E1 agrees with this recommendation. E1 collaborated with the Evaluator to develop the evaluation plan for 2018. The Evaluator performed a full process evaluation for NHC in 2018.	2018
Conduct a billing analysis to review the overestimation ratio. The current overestimation ratio was obtained from a billing analysis of Home Energy Assessment participant data. In past years, no billing analyses were conducted with NHC participants since only a few participants had their as-built energy consumption value available. Now that energy consumption is available for more participants and a new version of HOT2000 is being used to calculate energy savings, the Evaluator recommends conducting a new billing analysis in the next evaluation to establish an overestimation ratio specific to new houses under NHC and the new version of HOT2000.	2017 NHC-R2	In Progress	E1 agrees with this recommendation. However, E1 has observed only a few completions under the new HOT2000 (version 11) rating system and, as such, the data is not currently available for an appropriate sample size. E1 has worked with the Evaluator and determined that the overestimation ratio obtained with HEA participant's from the 2018 Evaluation will be used for NHC completions in 2018 under the new HOT2000 (version 11) rating system.	2019

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Continue to monitor the market evolution of LED lamps and adapt the BER offer when needed. The 2017 evaluation served to confirm solid market evolution. The high number of LEDs sold during the 2017 year, their declining retail prices, as well as the increased market share and free-ridership levels for these products indicate that market barriers are decreasing. Moreover, the market analysis confirmed that while LED products are still in a growth phase, they are approaching maturity as the BNI sector increasingly adopts these technologies. The Evaluator therefore recommends that ENS continue to monitor the evolution of the LED market by examining market indicators such as those discussed in Section 7 to identify when some product categories should be removed from the service due to a high level of market transformation.	2017 BER-R1	Complete	E1 agrees with this recommendation. E1 continues to monitor the evolution of the LED market. The Evaluator conducted a market evolution on LEDs in 2018. As of January 1, 2019, E1 has removed: general-use LEDs, decorative LEDs, reflector LEDs, downlight LEDs and LED wall sconces from BER-Instant Rebates and BER-Mail In Rebates.	2019
Identify opportunities to diversify the portfolio of projects completed through BER Mail-In. As demonstrated in the 2017 evaluation, lighting projects account for over 60 percent of gross savings in BER Mail-in. Since Instant Rebates is designed to offer almost exclusively lighting products, Mail-in is the best option to diversify the BER portfolio which generates the most savings of all ENS program components. With LED lighting products becoming increasingly popular and transforming the lighting market, ENS is at risk of seeing its savings decline for this service. The Evaluator expects to see continued increases in both free-ridership and baselines as the technology is more widely adopted. Therefore, the Evaluator recommends that ENS identify BNI sectors that are currently underrepresented in the Mail-in service and that could potentially generate significant savings.	2017 BER-R2	In Progress	E1 agrees with this recommendation. The Evaluator has completed 15 contractor interviews that aimed to identify ways to generate more interest and participation in non-lighting measures, discuss the rebate levels for non-lighting measures and obtain opinions on which technologies should be added to BER. The Evaluator also used on-site visits to collect information on the awareness and interest of participants in measures other than lighting. E1 continues to research and develop non-lighting measures to add to the BER portfolio.	2019

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Continue and improve the tracking of BER Instant Rebates participants. The 2017 evaluation was the first time that the Evaluator had access to a list of Instant Rebates participants and could therefore conduct a survey of participants. However, the participant list did not include all participants and information was not collected systematically. The Evaluator recommends that ENS continue tracking individuals and businesses participating in the service. ENS should document the data-collection process and, if possible, record the proportion of tracked participants among all participants as well as the savings attributable to each participant. This would allow the Evaluator to refine the quality of the impact analysis, notably with better estimations of annual hours of use as well as free-ridership and spillover levels.	2017 BER-R3	Complete	E1 agrees with this recommendation, which was implemented. E1 now tracks BER Instant Rebate participant information. E1 has documented the data-collection process. E1 will work with the Evaluator to provide as much detail as possible at a participant level.	2018
Continue relying on BDMs to assist participants and find new markets. The 2017 evaluation showed that many participants heard about Retrofit from a BDM and those who worked with a BDM were satisfied with their interactions. This support included providing answers to the participants' inquiries, especially about eligibility requirements, and informing about the latest service changes. In some cases, these relationships also resulted in identifying additional projects. The BDMs have successfully brought in numerous participants from the aquaculture industry and are looking for new markets to replicate this success. To maintain a high level of participation in Custom, the Evaluator recommends that ENS continue to expand outreach efforts via BDM contacts with specific business groups in the industrial and agricultural sectors.	2017 Custom-R1	Complete	E1 agrees with this recommendation, which was implemented. BDMs and Custom staff collaborate on a regular basis for project, program, and participant-related matters. BDMs continue to build relationships with major developers and consultants to secure New Construction projects. E1 has expanded BDM outreach to the seafood/fish-processing and mining sectors.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Continue conducting an in-depth review of energy models as part of the evaluation and improve ENS staff's capacity to identify discrepancies in energy models. The more in-depth review of energy models conducted during the 2017 evaluation identified discrepancies in all five projects and resulted in significant downward adjustments to savings. Modelling of heat pump systems and manual calculations to adjust baselines were most problematic. This showed that a systematic review should be conducted, even if energy models are prepared by experienced consultants. The Evaluator also recommends that ENS provide tools and training to their staff so that they are better able to conduct technical reviews of energy models. Those tools could include checklists of parameters to validate for certain types of projects or building systems.	2017 Custom-R2	In Progress	E1 agrees with this recommendation. E1 has created QA procedures to ensure that key variables are consistently reviewed in the energy models. E1 procured the services of a third party energy model reviewer to assist with key projects and ad-hoc program support. The third party energy model reviewer was procured late in 2018, therefore projects sampled by the Evaluator were not reviewed according to this new procedure.	2019
Establish clear objectives for Building Optimization. The Building Optimization projects reviewed this year differed widely in scope. Some projects involved detailed investigative work to tap into deep energy savings, while others were limited to replacing known broken equipment or repairing recently installed mechanical systems that had never worked as intended. While all projects generated savings and all participants benefited from Building Optimization, the participants' needs were quite different from one another. The Evaluator believes that clearly establishing the objectives of the service would result in providing the right level of support to each participant and maximizing the added value of ENS support, that is, involving specialized consultants in retrocommissioning only when detailed investigation of energy-saving opportunities is a project's objective. Better defining objectives and eligibility criteria would also clarify how the basecase should be established. For example, the project whose mechanical systems had never worked as intended had a basecase with such a high number of hours of use that the cooling towers would have provided far too much cooling to the building. An analysis of what should qualify as an acceptable Building Optimization project would allow for distinguishing between the ordinary repairs that a building owner needs to make his or her building function normally and the real energy-saving opportunities for improving energy performance above a minimum level. Better objective-setting would allow for allocating Building Optimization's financial and technical resources to those projects that will most benefit from them.	2017 Custom-R3	In Progress	E1 agrees with this recommendation. E1 has updated program documents to more effectively screen projects and reflect clear objectives and eligibility criteria. E1 is also working towards developing requirements for ENS's Building Optimization Service Provider list. These requirements will ensure that Service Providers are engaged in Building Optimization and have the appropriate qualifications.	2019

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Better document the basecase conditions for Building Optimization projects. The Evaluator observed that the basecase conditions were sometimes not measured or documented (using photos, for instance). Since these conditions cannot be verified because they no longer exist after project implementation, the Evaluator recommends that ENS gather more information about the pre-implementation conditions to support savings evaluation afterwards.	2017 Custom-R4	In Progress	E1 agrees with this recommendation. E1 now requires more in-depth documentation of base case conditions, including gathering more information about the pre-implementation conditions. E1 plans on developing resources to assist Service Providers.	2019
Ensure that the tracking sheet is complete and accurate. While reviewing the project documentation, the Evaluator found several discrepancies between the savings figures reported in the final tracking sheet and the savings figures documented in the annual savings reports. Also, two of the four projects claimed peak demand savings in their annual reports; however, this information was not tracked by ENS in the tracking sheet. The Evaluator recommends that, from now on, the final tracking sheet be updated with the final values documented in the annual reports and that annual peak demand savings be tracked.	2017 EMIS-R1	In Progress	E1 agrees with this recommendation. E1 has updated its process for submitting the final tracking sheet to the Evaluator. This includes a QA step to validate the tracking sheet with the annual reports for both peak demand savings and final monthly energy savings. E1 will continue to ensure the tracking sheet is accurate prior to being submitted to the Evaluator.	2019
Design baseline regressions and plan M&V activities to ensure accurate savings calculations even when changes occur in the facility. This year, the Evaluator discovered that one project had an increase in the weekend production time, which impacted potential energy savings for the measures implemented through EMIS. Since the production level variable was not documented, the Evaluator could not adjust the savings accordingly. To avoid such an issue, the Evaluator suggests that ENS and the service provider proactively identify and track independent variables so that the baseline remains relevant even when changes in operations occur. The Evaluator also recommends that M&V activities and non-routine adjustments be planned as needed. In the case of the Custom Retrofit compressed-air projects implemented after the baseline period for instance, ENS and the service provider could have planned on the implementation of those Custom Retrofit projects by gathering the baseline data before their implementation and made the necessary baseline adjustments afterwards.	2017 EMIS-R2	Complete	E1 agrees with this recommendation, which was implemented. E1 has updated the tracking sheet to include an event log for participants. E1 conducts quarterly calls with all participants to track cross-participation, production changes, facility changes, and if updates to the model are required. This will ensure that independent variables are proactively identified, and the baseline can be adjusted if needed. E1 is working with participants and the Service Provider to complete any non-routine adjustments as they take place throughout the year. E1 uses the updated tracking sheet to track when the need for non-routine adjustments arise, and document when and how the model has been changed to reflect these adjustments. The Evaluator has noted that the regressions were appropriately updated and the required M&V data was tracked.	2018

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Recommendation Text	Source	Status	Comments	Expected Period of Completion
Implement an internal procedure to identify and thoroughly review the most complex custom projects to ensure savings calculation accuracy. During the projects review, the Evaluator found one large custom project which was based on an incorrect energy model and that could not be revised with the limited information available. Modelling software or complex engineering equations are often used to estimate custom projects' savings. Validating their savings requires specialized technical knowledge and a more in-depth review procedure, unlike other more typical SBES projects. Since custom measures often represent the ones with the largest savings, ENS should review in greater detail the savings calculations for these custom measures. To that end, it may be advisable for the SBES team to seek assistance from the Custom Incentive Program's personnel, who already have the skills and expertise needed for reviewing this type of project.	2017 SBES-R1	Complete	E1 agrees with this recommendation, which was implemented. SBES program staff now utilize Custom program staff to support the savings estimations and project review procedures for large Custom projects.	2018
Closely monitor the new lighting application forms' effectiveness to confirm that they are achieving their intended goals. Following last year's recommendations, ENS developed new lighting application forms to better document on-site operating conditions, thereby enabling more accurate savings estimates. Since these forms were not put in use until January 2018, the Evaluator could not judge the impact these new forms had with respect to their intended goals. Nonetheless, the similarities between this year and last year in the adjustments made to lighting projects suggest that these new forms, if properly used, could indeed help improve savings calculation accuracy. ENS should carefully monitor how participants complete these forms and how the collected information is used to calculate the savings. Special attention should be paid to the peak coincidence factor used to calculate the peak demand savings to ensure that the daily operating schedule coincides with the system peak demand period, since the Evaluator found multiple cases where adjustments were required.	2017 SBES-R2	Complete	E1 agrees with this recommendation, which has been implemented. E1 has updated product worksheets and will continue to closely monitor the new worksheets to confirm effectiveness of recent updates. E1 has educated existing contractors on properly filling out forms with measure locations and business run-time hours. E1 also performs quality assurance site visits to validate measure locations and business run-time hours.	2018

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Investigate new ways to encourage the implementation of non-lighting measures to increase their share of savings and ultimately increase SBES's total savings. Although SBES offers a wide variety of measures, lighting retrofits accounted for 82 percent of SBES's total gross savings in 2017. This predominance is not surprising among DIY participants, because lighting upgrades are energy-saving opportunities which are easy to identify. Surveyed participants mentioned that a lack of knowledge about equipment is one main barrier to installing energy-efficiency upgrades; so this is consistent with the small number of projects that include technologies that are more complex than lighting. With SBES gaining in maturity and as the market for energy efficient lighting becomes saturated, the Evaluator believes that ENS would benefit from exploring various options to favor a wider variety of measures among the DIY participants to ensure SBES's continued strong performance. Such options could include the development of new marketing and educational materials to better promote non-lighting measures and educate DIY participants with respect to dormant energy-saving opportunities, other than lighting, in their facilities. Project analyses under the audit path can be used to identify sector-specific opportunities and provide content for the development of success stories on non-lighting measures. Another option would be to provide additional support to participants who do not complete the audit path, for instance by having an ENS staff member follow up to help them consider non-lighting measures if the facility includes other large energy-consuming equipment.	2017 SBES-R3	In Progress	E1 agrees with this recommendation. E1 is currently exploring new marketing strategies, capturing opportunities while performing site visits, and following up with past participants to help identify new opportunities for energy savings. E1 promotes technologies and energy efficiency trends, beyond lighting, through a technical series delivered on its website. Similar trends (beyond lighting) are highlighted in the ENS e-newsletter which is distributed to subscribed BNI participants six times per year.	2019

Table 3
Update on Implementation of 2017 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Include some Amendment 13 standards in the 2018 evaluation. The new standards set forth in Amendment 13 came into force at the end of June 2017. Most of these new standards were not included in the 2017 evaluation since their impact was expected to be limited until January 2018 while retailers sell their existing stocks. For the 2018 evaluation, these new standards should be considered for inclusion. However, a review of Amendment 13 shows that many of the new MEPS will only have a limited impact in terms of savings, since the new MEPS either bring very little change to the standard level or target products with small markets. The Evaluator therefore recommends selecting two or three products from the Amendment 13 standards based on their savings potential and a consideration of how much effort will be needed to estimate their market sizes. The 2017 evaluation showed that clothes washers (Amendment 13) provided considerable savings and should still be included in the 2018 evaluation, whereas refrigerators (Amendment 13), due to their low savings, should no longer be included. The Evaluator recommends continuing to evaluate the impacts associated with lighting, street-lighting and building codes in 2018 since they provide significant savings.	2017 CS-R1	Complete	E1 agrees with this recommendation, which has been implemented. The Evaluator has included Amendment 13 standards in the 2018 Evaluation report. The regulations evaluated in 2018 included the latest MEPS on general service incandescent lamps, street lights, Tier I clothes washers, Tier II clothes washers, incandescent reflector lamps, general-service fluorescent lamps, and fluorescent lamp ballasts, as well as the latest energy code for houses, small buildings, large buildings, condos and apartments.	2018

Table 4
Update on Implementation of 2017 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Recommendation 2017 General-SVR-1: The Savings Verification study recommends acceptance of the 2017 evaluation results for energy savings and for demand-reduction for all programs.	SVR-1	N/A	N/A	N/A
Recommendation 2017 General-SVR-2: The Savings Verification study recommends increase in the level of effort in process evaluation for the next evaluation.	SVR-2	Complete	E1 agrees with this recommendation, which was implemented. The Evaluator conducted three process evaluations in 2018, which was an increase in level of effort compared to the two process evaluations completed in the 2017 evaluation.	2018
Recommendation 2017 General-SVF-3: The Savings Verification study recommends that Efficiency Nova Scotia work on marketing and promotion of non-lighting measures for the next DSM cycle.	SVR-3	Complete	E1 agrees with this recommendation. The Spring and Fall campaigns for Instant Savings have a strong focus on dehumidifiers and air purifiers, in an attempt to diversify the program component. E1 promotes non-lighting technologies and energy efficiency trends, beyond lighting, through a "technical series", which is delivered on E1's website, as well as through its e-newsletter which is sent to a list of BNI participants six times per year.	2018
Recommendation 2017 HEA-SVR-4: Determine if additional health and safety issue training, including mold problems and fiberglass precautions is required for HEA.	SVR-4	Complete	E1 agrees with this recommendation, which was implemented. E1 provided all Service Organizations (SOs) with health and safety training with respect to building science and indoor air quality with a focus on moisture and mold. The training included a review of energy advisor technical procedures and expectations, and a commitment from SOs to ensure Energy Auditors (EAs) are reminded of their requirements to identify signs of moisture problems. EAs are required to recommend that the participant have a qualified specialist investigate further if the home has suspected indoor air quality problems.	2018

Table 4
Update on Implementation of 2017 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Recommendation 2017 GH-SVR-5: In future evaluations, the evaluator should report on the structure and process of inspection/verification for Green Heat installations, including proportions of inspections carried out by the equipment installer/contractor and those final inspection/verifications carried out directly on-site by Efficiency Nova Scotia or by an independent inspection service reporting to Efficiency Nova Scotia rather than to the equipment seller or installer.	SVR-5	Complete	E1 agrees with this recommendation, which has been implemented. Inspection and/or verification of installed equipment is not performed by E1 staff or installers/contractors. Rebates are issued following the purchase and installation of the equipment; ENS site visits are conducted subsequently to this. The intent of ENS staff site visits are to confirm that the correct model(s) is (are) installed at the site, and to ensure the correct rebates were allocated to the participant. E1 engaged Research Into Action to assess the effectiveness of E1's site visit quality assurance (QA) practices and procedures, results from the evaluation can be found in the Practices and Procedures Evaluation: Site Visit Quality Assurance.	2018