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Request IR-1:

For each of the projects listed in Figure 7 of the Application,

- (a) Please specify whether the project is proposed for sale of power to NS Power, supply of energy behind the customer meter, or wheeling of power.**
- (b) If the energy and capacity were offered to NS Power, would it have any reason to purchase the power?**
- (c) If the power is to be wheeled to an NS Power customer, under what tariff would that occur?**
- (d) For each of the proposed projects from which power might be sold to NS Power, how much equivalent or firm capacity would NS Power credit the project?**
- (e) Please explain where this project appears on the Combined T/D Advanced Stage Interconnection Request Queue, the Active Transmission Interconnection Requests line, or the Active Distribution Interconnection Requests list.**
 - (i) If it has not applied for interconnection, why does NS Power believe it is likely to be built?**
- (f) Do the customers proposing these projects have any reason, other than reducing the cost of their electricity, to build these projects?**
- (g) Please explain why “NS Power estimates that up to 75 percent of these DER projects will be built.”**

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1 **(i) Please clarify whether the 75% value refers to 75% of the 9 projects (or 7**
2 **projects) or 75% of the 300 MW total, or 225 MW.**

3
4 **(ii) What probability would NS Power place on 75% of the projects being built?**

5
6 **(iii) If 75% is the high end of the plausible construction, what is a corresponding**
7 **low end?**

8
9 Response IR-1:

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11 (a) Approximately 75 percent of these projects are for self-supply behind the meter with the
12 remaining projects considering wheeling energy across NS Power system or selling
13 directly to NS Power.

14
15 (b) At this time, NS Power does not believe there is a need to purchase the power from a
16 third party unless it creates benefits for customers.

17
18 (c) Please refer to part (a) above.

19
20 (d) Please refer to part (b) above.

21
22 (e) The only customers from this list that have applied for interconnection are [REDACTED]
23 [REDACTED]. NS Power believes that 75 percent of these
24 projects have potential to be built based on direct conversations with customers.

25
26 (f) NS Power does not believe these projects will reduce the cost of customers' electricity.
27 Customers are looking to reduce their GHG emissions through some of these proposed
28 projects, increase their power reliability, or allow them to reach their corporate
29 sustainable energy goals over time. Customers may additionally be looking to utilize the
30 steam offtake of the proposed fossil fuel units for processing and/or heating requirements.

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- 1 (g) The 75 percent assumption is based on direct discussions with customers.
2
3 • The 75 percent value refers to 75 percent of 26 proposed projects, which fall into
4 the nine specified categories of DER projects.

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1 **Request IR-2:**

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3 **What level of summer load reduction would be necessary to allow NS Power to mothball**
4 **another coal unit in the summer, following the retirement of Langan 2?**

5
6 **(a) What level of summer peak load requirement would be required to maintain**
7 **reliability targets with one fewer coal plant in the summer?**

8
9 Response IR-2:

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11 “Mothballing” a unit refers to shutting down a unit for an extended period of time. NS Power has
12 assumed this question refers to seasonal planned economic outages.

13
14 As NS Power schedules many of its maintenance outages for the summer period, the level of
15 summer load reduction to maintain the minimum required capacity would vary depending on
16 maintenance requirements across the fleet in a given year and system stability requirements.

17
18 Please also refer to CA IR-3 and NSUARB IR-22.

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Request IR-3:

Has NS Power determined, aside from reliability considerations, what fuel savings it experiences from having all remaining coal units (Lingan 3 and 4, Aconi, Tupper, and Trenton 5 and 6) available in the summer, rather than mothballing an additional coal unit?

(a) How much would NS Power save in OM&G and periodic sustaining capital expenditures, if it mothballed one more coal unit in the summer.

(b) What reduction of summer energy load reduction would make summer mothballing cost-effective, if it is not cost-effective at current energy levels.

Response IR-3:

“Mothballing” a unit refers to shutting down a unit for an extended period of time. NS Power has assumed this question refers to seasonal planned economic outages.

Plexos, the system dispatch optimization model used for system planning and fuel forecasting, produces an economically optimal generation mix under a set of reasonable assumptions for each year. To date, the forecast models have not produced an optimal solution with seasonal outages for any coal units. Inherently this suggests any seasonal outages of units would drive a less optimal, more costly solution. NS Power continues to monitor its forecast results to flag any ultra-low utilization of units in the summer that could indicate a seasonal outage would be cost-effective.

Even if a unit is not required for capacity in the summer to meet minimum system reliability requirements, it still may be optimal to keep the unit available to provide other system services and/or economic energy. The cost effectiveness of operating a unit year-round or seasonally depends on many factors beyond the required load; therefore, it is not possible to conduct an

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- 1 analysis of cost-effectiveness of seasonal shutdown based solely on energy reduction. Please also
- 2 refer to NSUARB IR-22.

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1 **Request IR-4:**

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3 **What level of winter peak reduction would be needed to allow NS Power to retire another**
4 **coal unit, in addition to Langan 2?**

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6 Response IR-4:

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8 Please refer to NSUARB IR-22.

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Request IR-5:

What level of summer load reduction would be necessary to allow NSP to mothball a Tufts Cove steam unit in the summer?

(a) For what portion of the province (e.g., counties, or NS Power zones) would summer load reductions affect the need for generation at Tufts Cove?

(b) What is NS Power's forecast of customer solar generation additions, and how would those additions affect the load reduction needed to allow mothballing of Tufts Cove capacity?

Response IR-5:

Please refer to CA IR-2 and NSUARB IR-22.

(a) Load reductions in the Halifax Metro and/or South Shore region could potentially reduce generation at Tufts Cove which is required to run to satisfy system requirements.

(b) NS Power's current forecast of customer solar generation additions is provided below. Please refer to NSUARB IR-22. NS Power does not anticipate solar additions to have a material impact on the ability to operate units seasonally.

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Year	Total New Installs
2019	483
2020	966
2021	1,476
2022	2,037
2023	2,651
2024	3,839
2025	5,537
2026	8,019
2027	10,435
2028	13,579
2029	17,670

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1 **Request IR-6:**

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3 **What level of winter peak reduction would be needed to allow NS Power to retire a Tufts**
4 **Cove steam unit?**

5
6 **(a) For what portion of the province (e.g., counties, or NS Power zones) would load**
7 **reductions affect the need for winter generation at Tufts Cove?**

8
9 **Response IR-6:**

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11 Please refer to NSUARB IR-22.

12
13 **(a) Load reductions in the Halifax Metro and/or South Shore region could potentially reduce**
14 **generation at Tufts Cove which is required to run to satisfy system requirements.**

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1 **Request IR-7:**

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3 **In the AMI proceeding, NS Power claimed benefits from deferring the need for a new**
4 **generating unit in the early 2020s. Would load reductions from energy-efficiency allow NS**
5 **Power to avoid that addition?**

6
7 Response IR-7:

8
9 Yes.

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Request IR-8:

Please describe NS Power's efforts to sell excess wind energy or renewable energy credits to markets in New England, and the prices achieved for such sales.

Response IR-8:

NS Power optimizes its generation fleet using a portfolio approach, exporting energy when the revenue received, net of transmission costs, is greater than the cost to produce this energy. When not required to meet Renewable Energy Standards, wind energy can be included in this export optimization. NS Power has qualified the South Canoe wind farm as a Class 1 renewable facility with the Massachusetts Department of Energy Resources, and as a result the Company receives one Massachusetts Class 1 Renewable Energy Credit (REC) for each megawatt-hour (MWh) of energy from this facility delivered to the ISO New England market. These credits can then be sold with revenues being credited to NS Power customers via the FAM. NS Power does not separately track energy revenue from sales of excess wind as these sales are not differentiated from those from other generating facilities within its portfolio. The prices achieved for sales of excess wind energy vary significantly as they are subject to real-time market pricing in New England, while REC pricing, although less volatile is still subject to market pricing. In 2017 and 2018 NS Power received \$1.2 million and \$0.3 million in net revenue in these years respectively for the sale of 64,400 and 23,700 RECs.

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Request IR-9

Please explain what effect the Nova Scotia-New Brunswick transmission additions implemented as part of the Maritime Link project has had or will have on NS Power's ability to sell renewable energy to New England.

Response IR-9:

NS Power does not believe these transmission additions have had, or will have, any effect on its ability to sell renewable energy to New England.

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Request IR-10:

NS Power states on page 17 of its Evidence that “E1 could follow the trend in other jurisdictions and wait to allow the benefit of the more expensive DSM measures to become more effective.” What other jurisdiction is this referring to?

Response IR-10:

Figure 4 on page 16 of NS Power’s Evidence shows a number of US jurisdictions that are reducing funding to their DSM programs, with many cutting funding by up to 20 percent. In Canada, British Columbia, Saskatchewan and Newfoundland and Labrador are all decreasing their DSM funding over the coming years. Below is a list of the US states from the graph that reduced their DSM funding;

2017 Change in EE Spending	
Louisiana	-56.75%
Hawaii	-43.80%
Pennsylvania	-28.43%
New Jersey	-26.31%
South Dakota	-24.18%
Connecticut	-19.79%
Nebraska	-12.17%
Arizona	-8.92%
Utah	-6.75%
Oklahoma	-5.98%
Iowa	-5.79%
Wisconsin	-4.68%
Montana	-4.31%
Maine	-3.75%

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2017 Change in EE Spending	
Washington	-3.23%
Arkansas	-0.17%

More recently, Alberta and Ontario have both announced proposed cuts to energy efficiency programs and Connecticut has announced that it is eliminating its efficiency programs. Please refer to the links below.

<https://www.courant.com/news/connecticut/hc-news-parks-passport-raid-follow-20190504-cjjnhgoxjfpfdi7lua7mtfmhq-story.html>

<https://theenergymix.com/2019/03/25/ontario-slashes-energy-efficiency-programs-delays-promise-to-cut-hydro-rates/>

<https://thenarwhal.ca/what-albertas-new-ucp-majority-government-means-for-the-environment/>

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Request IR-11:

Reference Figure 5 of NS Power's Evidence.

(a) What is the relevance of "non-electricity DSM" programs to electric savings and spending goals for E1?

(b) What electric savings are projected from the Federal Low Carbon Economy Fund?

Response IR-11:

(a) Non-electricity DSM funding is money available for efficiency upgrades. While these funds do not contribute to system load reductions, they are relevant to future DSM spending. For example, a customer with fossil fuel heat and hot water may benefit from this program to perform building shell upgrades. If that same customer were to replace the existing heating and hot water systems with electric options to save money and reduce carbon dioxide emissions, then that home would not need building shell upgrades funded by electricity DSM programs. The total pool of money available for efficiency upgrades across all energy sources impacts overall building stock in the province, which in turn has an impact on the necessary level of funding from customers for efficiency programs.

(b) NS Power has not estimated the electricity savings tied to the Low Carbon Economy Fund, but it appears that the Low Carbon Economy Fund could overlap with E1's current suite of programs. In a press release dated October 12, 2018 the federal government identified the following examples of how the funding will be used:

The Instant Rebate program will provide rebates on the purchase of products—such as LED lights, motion sensors, and

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1 electrical power bars—and energy efficient appliances—such as
2 washers and refrigerators.¹

¹ <https://www.canada.ca/en/environment-climate-change/news/2018/10/canada-and-nova-scotia-announce-funding-to-help-homeowners-improve-energy-efficiency-and-save-money.html>

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Request IR-12:

“While EE is an integral part of NS Power’s resource mix, from a system planning standpoint it is not a good substitute for dispatchable resources.” (Appendix A page 13).

(a) Please explain why reducing load by a particular amount (e.g., 50 MW) is not a good substitute for dispatchable resources.

(b) Please provide the ramp rate for each NS Power steam unit, in MW/minute.

For each NS Power steam unit, please provide the time required from cold shutdown to first power delivery to the grid.

Response IR-12:

From Richard Levitan, Levitan & Associates, Inc.:

(a) The purpose of EE is primarily to reduce energy consumption, not coincident demand expressed in MW. The timing of energy consumption or even demand reduction may not necessarily coincide with NS Power’s system needs. In contrast, dispatchable resources can address the system requirements exactly when needed.

From NS Power:

(b) Unit ramp rates are provided in the table below.

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	Ramp Rate (MW/min)
Lingan 1	2
Lingan 2	2
Lingan 3	2
Lingan 4	2
Pt Aconi	1
Pt Tupper	2
Trenton 5	1.75
Trenton 6	2
Tufts Cove 1	1
Tufts Cove 2	2
Tufts Cove 3	2
Tufts Cove 6	3.5
Port Hawkesbury Biomass	1

The table below provides typical cold start up times which may deviate based on various unit parameters.

	Cold Unit Start Up Times (hours)
Lingan units	16
Pt Aconi	24
Pt Tupper	16
Trenton units	16
Tufts Cove 1, 2, & 3	16
Tufts Cove 6	4
Port Hawkesbury Biomass	24

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1 **Request IR-13:**

2
3 **Reference the Evidence of Mr. Levitan on page 14, lines 17 through 19. Is it Mr. Levitan's**
4 **position that a measure must pass the TRC test in order to be included in E1's DSM**
5 **programs? Why or why not?**

6
7 Response IR-13:

8
9 **From Richard Levitan, Levitan & Associates, Inc.:**

10
11 EfficiencyOne justifies its DSM programs using the TRC test at the program level, not at a lower
12 measure level. Therefore, potentially, some measures comprising the programs may fail the
13 TRC test if tested individually, but nevertheless be included in the Preferred Plan. In my
14 opinion, measures that do not pass the TRC test add uncertainty and inefficiency to
15 EfficiencyOne's DSM programs. Ideally, measures that do not pass the TRC test if tested
16 individually should not be included in E1's DSM programs because they reduce cost-
17 effectiveness of the DSM programs. However, I understand that exclusion of the non-cost-
18 effective measures would require the Board's decision that each measure must pass the TRC test
19 to be included in the program. It is my understanding that at present no such requirement is in
20 place in Nova Scotia.

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Request IR-14:

Please explain how the quote from the NS Power Evidence in the 2016-2018 DSM Plan on lines 18–23 of Appendix A, page 16, supports the conclusion that “EfficiencyOne may have underestimated the natural penetration of DSM” (ibid, line 16).

(a) How did Mr. Levitan conclude that the lower actual cost in 2014, compared to the approved plan, was due to higher-than-expected natural penetration of DSM, and not lower incremental costs for efficient equipment, better contracts with installers, or a lower-cost mix of measures installed?

Response IR-14:

From Richard Levitan, Levitan & Associates, Inc.:

The quote from the NS Power Evidence in the 2016-2018 DSM Plan on lines 18–23 of Appendix A, page 16, explains that EfficiencyOne actually achieved significantly lower costs than proposed. EfficiencyOne did not specify the causes of the cost reduction. In my professional opinion, natural or “organic” penetration of DSM could be a reason for the lower actual costs. Therefore, the quote is relevant.

(a) I did not assert that the natural penetration of DSM was the only reason for lower actual cost in 2014. The other reasons referenced in the request also help explain the result. There may be other reasons as well.

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1 **Request IR-15:**

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3 **Please describe what Mr. Levitan means by “saturation” in his statement that “the Mid**
4 **DSM Case...may result in saturation” (Appendix A, p. 17).**

5
6 Response IR-15:

7
8 **From Richard Levitan, Levitan & Associates, Inc.:**

9
10 In this context, saturation means achieving a very high level of measure adoption through
11 excessive incentives in a short period. Saturation means achieving a much higher penetration
12 rate in the Nova Scotia energy market than would have naturally occurred.

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Request IR-16:

Mr. Levitan expresses concern about “significantly increased efforts for DSM measures beyond what is recommended would accelerate adoption of measures that barely passed the cost-effectiveness test through the brute force of regulatory fiat.” (Appendix A, p. 17)

(a) Please provide the basis for the assertion that the increased efforts in 2020–2022 would “accelerate adoption of measures that barely passed the cost-effectiveness test.”

(b) Please identify the measures that are of concern to Mr. Levitan.

(c) Please explain how Board approval of one DSM plan rather than another constitutes “the brute force of regulatory fiat.”

(d) Does Mr. Levitan consider every planning decision the Board makes (e.g., approving the Maritime Link) to amount to “the brute force of regulatory fiat”?

Response IR-16:

From Richard Levitan, Levitan & Associates, Inc.:

(a) Please refer to Attachment 1. The approval of the measures in Attachment 1 would result in deployment of measures that may not be ready because their TRC ratios are either smaller than 1 or almost 1. Measures with TRC value smaller than 1 are not cost-effective. Measures with TRC ratios slightly higher than 1 may not be cost-effective due to measurement error, i.e., uncertainty incorporated in the TRC ratio.

(b) The measures with a TRC ratio smaller than or equal to 1 and slightly higher than 1 are of concern. Please refer to Attachment 1.

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1 (c) Board approval of a DSM plan that allows for the inclusion of non-cost-effective
2 measures to satisfy regulatory requirements would force the inclusion of measures that
3 would not be included in a plan that only allowed the inclusion of verified cost-effective
4 measures.

5
6 (d) No, on the contrary, the Board has demonstrated a commitment to analytic rigor to
7 support, modify or reject planning decisions. In this instance, EfficiencyOne's Preferred
8 Plan could be approved through the brute force of regulatory fiat simply because it
9 includes 50 measures with TRC ratios less than 1 and 23 measures with TRC ratios
10 ranging from 1 to 1.26. The is, in my view, a bad idea for consumers as the Preferred
11 Plan includes measures that fall short of 1 or measures that are in the aforementioned
12 range.

Measure Name	2020 TRC (Ratio)	2021 TRC (Ratio)	2022 TRC (Ratio)
Air Conditioner retirement	0.36	0.41	0.45
Dehumidifier replacement (Low income only)	1.11	1.15	1.20
Freezer replacement (Low income only)	0.67	0.71	0.75
Refrigerator replacement (Low income only)	0.32	0.34	0.36
Clothes Dryer replacement	0.14	0.15	0.16
Clothes Washer replacement	0.19	0.19	0.20
Dishwasher replacement	0.14	0.14	0.15
Freezer replacement	0.62	0.66	0.71
Fridge replacement	0.31	0.33	0.35
Range / Stove replacement	0.09	0.09	0.10
Advanced Lighting Design (Performance Lighting)	0.63	0.66	0.69
Circulation Fan (Agriculture)	1.04	1.10	1.17
Cycling Refrigerated Air Dryer - 50 CFM	0.99	1.03	1.08
Daylighting Controls - Ceiling Mounted	1.04	1.11	1.18
Daylighting Controls - Switch-Mounted	0.38	0.40	0.43
Electric Combination Oven with Gas	0.36	0.40	0.44
Electric Convection Oven with Gas	0.34	0.39	0.45
ENERGY STAR Uninterruptible Power Supplies (UPS)	0.09	0.10	0.11
High Efficiency Circulator Pump 1.5kW	1.04	1.08	1.13
High Efficiency Circulator Pump 300W	1.08	1.12	1.17
LED Replacement Lamps for HID (4000 lumen)	1.10	1.15	1.20
LED Troffer (1x4)	1.19	1.21	1.26
LED Troffer (2x2)	1.09	1.10	1.15
Linear Ambient Luminaire (10000 lumen)	0.85	0.89	0.93
Linear Ambient Luminaire (8000 lumen)	0.39	0.41	0.43
Occupancy Sensor (Exterior)	1.08	1.12	1.16
Open to Closed Cooler Conversion	0.35	0.37	0.38
Ventilation Fan (Agriculture)	0.40	0.41	0.43
VFD Milk Transfer Pump	0.72	0.74	0.78
7W GU10 Replacing 35W - MURB	1.10	0.89	0.67
7W GU10 Replacing 35W	1.10	0.89	0.67
9.5W Replacing 40W - MURB	0.98	0.90	0.87
9.5W Replacing 40W	0.98	0.90	0.87
9W Replacing 40W - MURB	1.06	0.98	0.96
9W Replacing 40W	1.06	0.98	0.96

Measure Name	2020 TRC (Ratio)	2021 TRC (Ratio)	2022 TRC (Ratio)
Dehumidifier replacement (Low income only)	1.11	1.16	1.22
Freezer replacement (Low income only)	0.68	0.73	0.78
Refrigerator replacement (Low income only)	0.34	0.37	0.39
Whole Home First Nations Retrofit	1.17	1.21	1.25
Clothes Dryers	0.29	0.31	0.32
Clothes Washers	0.16	0.17	0.18
Heat Pump Water Heater	0.32	0.33	0.34
Programmable Thermostats	0.00	0.02	0.07
ASHP and AWHP - Electrical	1.01	1.03	1.06
Heat Pump Water Heater	0.37	0.38	0.39
Solar air heating	0.20	0.21	0.22
Solar Domestic Hot Water	0.86	0.90	0.95
Heat Pump Water Heater	0.37	0.38	0.39
Solar Domestic Hot Water	0.65	0.69	0.73
Dehumidifier	0.52	0.53	0.55
Dimmer Switch	0.90	0.94	0.98
ECM Circulator Pump	0.60	0.63	0.65
Efficient clothes washer	0.82	0.86	0.90
Indoor motion sensor	0.92	0.98	1.04
LED - ENERGY STAR Fixture without Motion Sensor	1.09	1.00	0.90
LED - Recessed downlight	1.01	0.88	0.74
Motion sensor with dimmer switch	1.06	1.13	1.20
Networked/ Connected - Indoor LED Lamp	0.20	0.21	0.23
Power bar with timer	0.53	0.58	0.63
Programmable thermostat	0.00	0.11	0.39
Smart power bar	0.53	0.58	0.63
Heat Pump Dryer (ventless)	0.43	0.45	0.47
Hybrid Heat Pump Dryer	0.40	0.41	0.43
Strategic Energy Management	1.06	1.16	1.27
LED Replacement Lamps for HID (4000 lumen)	0.91	0.95	0.99
LED Troffer (1x4)	1.04	1.05	1.10
LED Troffer (2x2)	0.96	0.97	1.01
LED Troffer (4x2)	1.19	1.20	1.26
Linear Ambient Luminaire (10000 lumen)	0.72	0.76	0.79
Linear Ambient Luminaire (4000 lumen)	1.13	1.18	1.24

Measure Name	2020 TRC (Ratio)	2021 TRC (Ratio)	2022 TRC (Ratio)
Linear Ambient Luminaire (8000 lumen)	0.36	0.38	0.39
Open to Closed Cooler Conversion	0.33	0.34	0.36
VFD Milk Transfer Pump	0.64	0.66	0.69

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Request IR-17:

Mr. Levitan says that in his “experience, it is desirable to set appropriate targets that align with the evolution of the market, that is, the decisions that residential and commercial customers make independently to embrace additional DSM measures.” (Appendix A, p. 17)

(a) Please explain this alignment and provide examples of targets that do align and targets that do not align with consumer decisions.

(b) Does Mr. Levitan believe that ratepayer-financed DSM programs should only consist of measures that customers have already decided to “embrace.” If so, why.

(c) Please provide the specific experiences that have led Mr. Levitan to this opinion, identifying the targets that did align and targets that did not align with consumer decisions, and the consequences of each set of targets.

Response IR-17:

From Richard Levitan, Levitan & Associates, Inc.:

(a) When a new technology is introduced in the market, consumers may accept the technology independent of any utility subsidy. The primary barrier for consumer acceptance is cost. In this case, a carefully designed DSM program may help overcome the barrier. The incentives under the DSM program would properly align with the consumers’ independent decision to implement new technology. However, when the DSM program is designed without any consideration of the market or disregards the consumers’ unwillingness to implement the new technology, expected results may not materialize.

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1 (b) No. Some DSM programs not initially embraced by customers may be successful if there
2 is adequate education and other enabling strategies are funded.

3
4 (c) Historically, DSM programs associated with the LED technology were very successful
5 because they were aligned with the consumers' decisions to replace incandescent bulbs in
6 their households. As a result, hundreds of millions of the LED bulbs were installed.
7 Introduction of the TOU rates without appropriate technologies and equipment turned out
8 to be ineffective in some instances simply because consumers did not "embrace" it (e.g.,
9 too much hassle, not worth it, inconvenience, discomfort, etc.). The consequence was
10 that the program was terminated (e.g., Peak Planner by NHEC started in 2016 and ended
11 in 2017). California set lofty goals initially in regard to TOU rates and load management
12 programs oriented around cycling central air compressors. Many programs turned out to
13 be ineffective simply because consumers found program participation not worth the
14 discomfort, among other factors.

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Request IR-18:

Please explain how “the direct benefits of reductions in billed demand, at least for those customer groups billed for facility peak demand,” constitute benefits for Nova Scotia electricity consumers as a whole. (Appendix A page 19)

(a) For each demand-billed customer for which NS Power has such data, please provide the monthly date and time of the billing peak.

Response IR-18:

The direct benefits of reductions in billed demand do not constitute benefits for consumers as a whole. However, there is some correlation between customer benefits and consumers as a whole. Reductions in billed demand potentially result in the reduction of the system coincident peak, all other things being equal. NS Power’s supply resources are designed to meet the coincident peak. As a result, the system would be inherently more reliable with the same amount of installed capacity when the coincident peak is reduced. Alternatively, while maintaining the same level of reliability, consumers as a whole would benefit from delayed or canceled new resource construction or, in the alternative, from earlier retirement of older thermal resources.

(a) Please refer to Attachment 1. The data is only available for customers who have remotely read interval meters.

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
1	2018/01/06 17:30	2018/02/03 13:00	2018/03/26 09:30	2018/04/01 13:00	2018/05/25 07:45	2018/06/16 20:15	2018/07/08 11:30	2018/08/13 08:00	2018/09/22 17:00	2018/10/22 22:15	2018/11/15 07:45	2018/12/10 14:15
2	2018/01/20 10:15	2018/02/08 11:15	2018/03/12 13:00	2018/04/28 12:30	2018/05/16 11:30	2018/06/30 11:30	2018/07/16 15:15	2018/08/22 11:45	2018/09/27 11:30	2018/10/19 12:15	2018/11/16 13:15	2018/12/03 16:15
3	2018/01/08 11:00	2018/02/27 09:30	2018/03/07 09:30	2018/04/19 13:15	2018/05/29 14:00	2018/06/13 10:15	2018/07/25 16:00	2018/08/14 16:45	2018/09/12 09:30	2018/10/15 14:15	2018/11/20 14:15	2018/12/06 12:15
4	2018/01/07 11:15	2018/02/17 11:30	2018/03/04 09:45	2018/03/09 13:00	2018/05/11 09:00	2018/06/03 10:15	2018/07/24 16:45	2018/08/19 13:30	2018/09/23 10:30	2018/10/19 11:30	2018/11/24 18:15	2018/12/09 12:15
5	2018/01/05 14:30	2018/02/22 16:15	2018/03/20 09:30	2018/04/09 13:15	2018/05/16 08:45	2018/06/15 16:00	2018/07/18 11:45	2018/08/08 08:30	2018/09/04 12:00	2018/10/26 08:00	2018/11/01 08:00	2018/12/06 08:30
6	2018/01/23 03:45	2018/02/28 12:30	2018/03/19 03:15	2018/04/20 14:45	2018/05/28 15:45	2018/06/25 19:15	2018/07/21 11:45	2018/08/16 13:30	2018/09/15 16:00	2018/10/04 21:15	2018/11/03 12:15	2018/12/22 15:15
7	2018/01/04 19:45	2018/02/07 17:00	2018/03/08 21:00	2018/04/25 16:00	2018/05/21 13:30	2018/06/30 16:00	2018/07/25 17:00	2018/08/15 15:00	2018/09/10 13:00	2018/10/08 15:00	2018/11/03 00:30	2018/12/28 22:00
8	2018/01/13 02:15	2018/02/14 04:00	2018/03/06 12:00	2018/04/26 15:30	2018/05/22 14:45	2018/06/20 14:45	2018/07/26 13:45	2018/08/22 16:15	2018/09/11 14:00	2018/10/03 13:30	2018/11/15 13:45	2018/12/31 09:15
9	2018/01/05 12:45	2018/02/11 04:00	2018/03/18 13:30	2018/04/10 12:45	2018/05/18 12:00	2018/06/04 09:45	2018/07/19 16:45	2018/08/02 18:15	2018/09/30 05:00	2018/10/07 22:30	2018/11/22 20:30	2018/12/22 23:30
10	2018/01/18 11:30	2018/02/18 09:45	2018/03/15 23:15	2018/04/27 02:15	2018/05/14 09:45	2018/06/14 11:15	2018/07/12 07:15	2018/08/09 06:15	2018/09/11 08:45	2018/10/24 09:45	2018/11/01 09:30	2018/12/11 10:00
11	2018/01/01 01:45	2018/02/05 18:15	2018/03/17 21:30	2018/04/01 11:15	2018/05/13 14:15	2018/06/20 12:00	2018/07/28 20:00	2018/08/11 20:15	2018/09/01 19:45	2018/10/06 19:00	2018/11/30 11:30	2018/12/31 20:00
12	2018/01/13 11:15	2018/02/15 20:30	2018/03/10 17:45	2018/04/06 17:00	2018/05/22 15:00	2018/06/20 14:45	2018/07/23 12:15	2018/08/09 14:30	2018/09/14 19:15	2018/10/09 18:15	2018/11/14 17:15	2018/12/29 12:00
13	2018/01/21 09:45	2018/02/21 06:45	2018/03/22 06:45	2018/04/17 14:15	2018/05/26 17:00	2018/06/12 08:15	2018/07/22 16:30	2018/08/03 08:45	2018/09/06 14:00	2018/10/03 06:30	2018/11/02 16:30	2018/12/30 09:45
14	2018/01/07 12:15	2018/02/03 12:15	2018/03/13 22:15	2018/04/27 11:15	2018/05/28 11:15	2018/06/04 10:30	2018/07/30 12:45	2018/08/18 16:45	2018/09/22 07:45	2018/10/18 18:45	2018/11/28 09:00	2018/12/19 11:00
15	2018/01/30 15:00	2018/02/23 15:45	2018/03/22 13:30	2018/04/16 13:45	2018/05/07 09:00	2018/06/05 08:45	2018/07/06 16:00	2018/08/01 11:15	2018/09/14 12:45	2018/10/27 11:45	2018/11/22 13:30	2018/12/08 09:00
16	2018/01/22 11:30	2018/02/15 12:00	2018/03/21 11:30	2018/04/06 11:15	2018/05/22 10:15	2018/06/11 10:00	2018/07/31 11:00	2018/08/09 12:00	2018/09/24 10:15	2018/10/05 10:45	2018/11/02 11:15	2018/12/19 10:15
17	2018/01/21 23:15	2018/02/05 23:00	2018/03/01 18:15	2018/04/05 13:00	2018/05/10 18:15	2018/06/06 20:00	2018/07/07 18:15	2018/08/06 19:45	2018/09/26 19:00	2018/10/14 20:00	2018/11/23 20:00	2018/12/02 18:45
18	2018/01/11 14:15	2018/02/27 10:15	2018/03/26 02:15	2018/04/17 10:15	2018/05/15 10:45	2018/06/26 05:15	2018/07/02 05:15	2018/08/24 08:30	2018/09/23 05:15	2018/10/22 06:30	2018/11/02 10:30	2018/12/12 15:00
19	2018/01/29 10:00	2018/02/05 10:15	2018/03/08 11:45	2018/04/09 11:15	2018/05/24 13:00	2018/06/11 08:30	2018/07/18 13:30	2018/08/30 12:00	2018/09/14 10:15	2018/10/12 12:00	2018/11/16 08:30	2018/12/04 12:15
20	2018/01/22 15:15	2018/02/11 17:30	2018/03/05 13:15	2018/04/25 14:00	2018/05/31 17:15	2018/06/21 16:00	2018/07/23 12:30	2018/08/13 13:00	2018/09/04 13:45	2018/10/10 11:45	2018/11/14 15:45	2018/12/13 18:45
21	2018/01/04 17:30	2018/02/19 22:30	2018/03/01 21:15	2018/04/15 20:30	2018/05/15 22:45	2018/06/10 21:15	2018/07/29 22:00	2018/08/29 20:30	2018/09/30 22:15	2018/10/19 20:00	2018/11/24 19:00	2018/12/13 23:15
22	2018/01/13 10:00	2018/02/28 12:45	2018/03/10 10:00	2018/04/28 11:45	2018/05/20 11:30	2018/06/02 10:15	2018/07/17 10:15	2018/08/30 13:15	2018/09/16 13:30	2018/10/04 13:15	2018/11/29 12:30	2018/12/20 13:45
23	2018/01/03 10:00	2018/02/02 08:45	2018/03/22 11:45	2018/04/27 08:15	2018/05/01 16:45	2018/06/13 09:15	2018/07/09 11:00	2018/08/13 09:15	2018/09/24 10:00	2018/10/03 08:45	2018/11/09 09:15	2018/12/20 08:30
24	2018/01/19 09:45	2018/02/15 08:00	2018/03/08 06:45	2018/04/16 07:30	2018/05/09 09:30	2018/06/28 10:15	2018/07/26 07:45	2018/08/08 10:15	2018/09/27 07:30	2018/10/12 06:45	2018/11/29 08:30	2018/12/07 08:00
25	2018/01/03 11:00	2018/02/23 11:45	2018/03/06 11:30	2018/04/10 11:45	2018/05/25 11:30	2018/06/06 09:45	2018/07/18 11:45	2018/08/30 11:45	2018/09/24 11:30	2018/10/22 09:15	2018/11/23 11:30	2018/12/14 11:30
26	2018/01/17 09:45	2018/02/12 08:00	2018/03/26 08:15	2018/04/16 12:45	2018/05/18 09:45	2018/06/15 09:15	2018/07/04 07:45	2018/08/21 08:45	2018/09/24 11:15	2018/10/16 11:30	2018/11/13 11:15	2018/12/14 10:00
27	2018/01/15 13:15	2018/02/09 13:15	2018/03/08 13:00	2018/04/05 11:45	2018/05/24 15:00	2018/06/14 11:45	2018/07/25 08:45	2018/08/31 10:30	2018/09/25 08:45	2018/10/31 10:00	2018/11/30 09:45	2018/12/10 09:45
28	2018/01/26 11:15	2018/02/09 11:15	2018/03/27 12:00	2018/04/24 11:00	2018/05/25 10:15	2018/06/08 09:45	2018/07/03 12:45	2018/08/30 14:15	2018/09/24 08:15	2018/10/19 11:00	2018/11/15 09:45	2018/12/11 08:30
29	2018/01/04 19:00	2018/02/03 20:00	2018/03/13 23:00	2018/04/09 20:00	2018/05/03 20:30	2018/06/04 06:15	2018/07/25 18:15	2018/08/04 17:30	2018/09/02 17:00	2018/10/26 10:00	2018/11/23 18:15	2018/12/09 08:15
30	2018/01/15 20:00	2018/02/13 19:45	2018/03/21 22:00	2018/04/05 19:15	2018/05/18 22:00	2018/06/07 00:30	2018/07/04 00:45	2018/08/08 19:45	2018/09/25 00:30	2018/10/11 22:00	2018/11/22 22:15	2018/12/28 02:00
31	2018/01/01 06:45	2018/02/19 09:30	2018/03/19 13:45	2018/04/20 11:15	2018/05/02 13:00	2018/06/01 10:15	2018/07/05 11:00	2018/08/03 14:45	2018/09/12 15:00	2018/10/15 09:30	2018/11/23 06:30	2018/12/06 10:45
32	2018/01/26 14:00	2018/02/01 11:00	2018/03/22 12:45	2018/04/24 10:45	2018/05/28 15:30	2018/06/20 13:15	2018/07/23 13:00	2018/08/01 15:00	2018/09/18 15:00	2018/10/10 10:15	2018/11/08 12:30	2018/12/13 11:00
33	2018/01/26 09:45	2018/02/09 08:45	2018/03/19 08:45	2018/04/27 10:30	2018/05/16 09:30	2018/06/08 08:30	2018/07/05 12:45	2018/08/07 14:30	2018/09/04 12:45	2018/10/03 09:45	2018/11/22 09:45	2018/12/13 09:45
34	2018/01/03 12:30	2018/02/16 15:00	2018/03/03 20:00	2018/04/06 10:45	2018/05/29 14:45	2018/06/30 15:30	2018/07/24 10:30	2018/08/08 14:30	2018/09/04 12:45	2018/10/10 09:45	2018/11/18 15:00	2018/12/29 09:15
35	2018/01/25 14:00	2018/02/13 10:00	2018/03/06 11:15	2018/04/19 11:30	2018/05/04 14:00	2018/06/19 11:30	2018/07/24 11:30	2018/08/07 11:30	2018/09/14 11:45	2018/10/03 11:30	2018/11/22 09:45	2018/12/06 10:30
36	2018/01/03 10:15	2018/02/03 10:15	2018/03/26 07:15	2018/04/03 06:15	2018/05/31 16:15	2018/06/29 15:45	2018/07/04 17:00	2018/08/07 14:15	2018/09/06 15:45	2018/10/27 08:00	2018/11/29 16:15	2018/12/31 10:00
37	2018/01/03 12:45	2018/02/13 12:30	2018/03/15 12:45	2018/04/03 12:45	2018/05/29 15:15	2018/06/29 15:45	2018/07/23 13:15	2018/08/27 12:30	2018/09/04 12:45	2018/10/10 10:30	2018/11/05 15:00	2018/12/11 12:45
38	2018/01/13 14:30	2018/02/27 16:45	2018/03/07 14:15	2018/04/23 14:45	2018/05/16 13:45	2018/06/19 13:00	2018/07/24 14:15	2018/08/08 14:30	2018/09/06 16:15	2018/10/04 12:30	2018/11/05 15:00	2018/12/03 12:30
39	2018/01/02 11:00	2018/02/01 09:00	2018/03/10 21:00	2018/04/28 17:15	2018/05/31 13:15	2018/06/27 14:45	2018/07/24 10:00	2018/08/30 15:15	2018/09/03 09:00	2018/10/04 09:00	2018/11/24 15:30	2018/12/08 17:30
40	2018/01/22 10:30	2018/02/13 11:00	2018/03/08 10:45	2018/04/24 11:15	2018/05/31 14:00	2018/06/01 14:45	2018/07/26 11:15	2018/08/08 13:45	2018/09/18 11:15	2018/10/10 10:30	2018/11/15 10:30	2018/12/19 11:30
41	2018/01/29 13:15	2018/02/06 14:45	2018/03/07 13:15	2018/04/04 12:00	2018/05/31 14:00	2018/06/01 13:00	2018/07/05 14:00	2018/08/14 13:30	2018/09/18 13:15	2018/10/10 11:00	2018/11/19 13:15	2018/12/03 12:15
42	2018/01/22 11:45	2018/02/06 13:30	2018/03/19 11:45	2018/04/09 11:45	2018/05/29 13:30	2018/06/01 11:45	2018/07/24 13:30	2018/08/07 13:30	2018/09/18 13:45	2018/10/04 13:00	2018/11/08 13:30	2018/12/03 12:00
43	2018/01/27 20:00	2018/02/19 15:00	2018/03/08 16:45	2018/04/30 16:15	2018/05/08 18:00	2018/06/29 14:00	2018/07/01 15:45	2018/08/08 11:00	2018/09/06 14:45	2018/10/27 20:00	2018/11/03 19:45	2018/12/31 15:00
44	2018/01/02 13:00	2018/02/14 08:30	2018/03/08 09:45	2018/04/17 05:15	2018/05/01 08:45	2018/06/06 05:45	2018/07/23 14:45	2018/08/15 13:15	2018/09/17 12:45	2018/10/02 05:45	2018/11/26 06:45	2018/12/31 04:45
45	2018/01/08 09:30	2018/02/06 08:30	2018/03/20 09:00	2018/04/10 07:00	2018/05/10 11:00	2018/06/15 10:30	2018/07/04 12:45	2018/08/30 13:45	2018/09/18 13:30	2018/10/11 13:00	2018/11/29 16:30	2018/12/13 08:15
46	2018/01/06 07:15	2018/02/03 07:00	2018/03/19 07:00	2018/04/15 06:45	2018/05/31 18:30	2018/06/01 17:30	2018/07/25 16:30	2018/08/07 15:45	2018/09/06 16:30	2018/10/26 07:00	2018/11/27 17:30	2018/12/27 06:45
47	2018/01/03 10:00											

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
56	2018/01/08 10:30	2018/02/22 10:30	2018/03/22 12:30	2018/04/24 13:00	2018/05/31 13:45	2018/06/01 15:00	2018/07/25 13:15	2018/08/30 15:15	2018/09/18 13:00	2018/10/10 11:45	2018/11/15 10:30	2018/12/13 10:15
57	2018/01/02 15:45	2018/02/08 12:15	2018/03/20 09:45	2018/04/17 12:30	2018/05/11 13:30	2018/06/29 15:45	2018/07/23 13:15	2018/08/07 14:30	2018/09/18 13:00	2018/10/24 14:00	2018/11/02 15:45	2018/12/12 16:45
58	2018/01/08 13:45	2018/02/13 11:30	2018/03/08 09:45	2018/04/09 13:30	2018/05/08 08:00	2018/06/21 14:30	2018/07/04 10:00	2018/08/07 10:30	2018/09/04 10:30	2018/10/17 08:15	2018/11/15 09:30	2018/12/13 16:00
59	2018/01/03 11:15	2018/02/06 10:30	2018/03/01 10:45	2018/04/10 10:45	2018/05/31 14:00	2018/06/19 12:00	2018/07/26 12:00	2018/08/03 10:45	2018/09/04 10:45	2018/10/10 10:45	2018/11/22 10:45	2018/12/13 10:45
60	2018/01/30 14:15	2018/02/09 11:30	2018/03/19 11:30	2018/04/09 11:00	2018/05/09 13:45	2018/06/19 14:45	2018/07/23 14:30	2018/08/07 13:30	2018/09/06 13:30	2018/10/29 13:15	2018/11/23 12:15	2018/12/12 14:00
61	2018/01/25 14:45	2018/02/07 16:30	2018/03/01 15:00	2018/04/04 15:00	2018/05/03 12:30	2018/06/25 11:30	2018/07/26 11:00	2018/08/14 13:00	2018/09/06 13:30	2018/10/04 13:30	2018/11/01 13:30	2018/12/05 17:00
62	2018/01/18 12:30	2018/02/14 11:30	2018/03/27 11:15	2018/04/04 11:00	2018/05/31 11:15	2018/06/29 16:00	2018/07/27 13:30	2018/08/07 14:00	2018/09/18 12:45	2018/10/10 10:45	2018/11/27 11:15	2018/12/06 11:30
63	2018/01/10 09:00	2018/02/13 09:30	2018/03/19 10:15	2018/04/09 11:15	2018/05/30 10:00	2018/06/19 12:45	2018/07/04 14:00	2018/08/30 14:45	2018/09/18 13:30	2018/10/03 12:00	2018/11/23 09:15	2018/12/14 09:30
64	2018/01/13 14:00	2018/02/03 18:30	2018/03/03 15:45	2018/04/28 14:45	2018/05/31 15:15	2018/06/01 14:15	2018/07/26 10:15	2018/08/30 14:15	2018/09/15 16:15	2018/10/30 17:45	2018/11/03 15:45	2018/12/22 14:30
65	2018/01/16 12:30	2018/02/06 11:15	2018/03/20 10:30	2018/04/27 13:45	2018/05/31 14:15	2018/06/29 15:15	2018/07/25 12:30	2018/08/07 12:15	2018/09/18 12:45	2018/10/10 10:15	2018/11/03 12:45	2018/12/19 11:45
66	2018/01/22 12:15	2018/02/06 10:30	2018/03/26 11:15	2018/04/03 12:00	2018/05/31 12:30	2018/06/30 10:00	2018/07/04 10:45	2018/08/07 14:00	2018/09/06 14:00	2018/10/04 12:00	2018/11/13 09:45	2018/12/06 11:45
67	2018/01/10 10:00	2018/02/12 11:30	2018/03/19 12:00	2018/04/10 12:15	2018/05/03 11:30	2018/06/07 11:30	2018/07/31 13:15	2018/08/29 09:30	2018/09/04 12:00	2018/10/09 08:00	2018/11/22 11:45	2018/12/12 10:15
68	2018/01/22 10:30	2018/02/02 08:30	2018/03/23 08:15	2018/04/17 13:15	2018/05/30 11:00	2018/06/21 15:15	2018/07/16 14:15	2018/08/02 11:15	2018/09/12 14:15	2018/10/05 12:15	2018/11/29 08:45	2018/12/20 10:45
69	2018/01/02 07:15	2018/02/01 07:15										2018/12/03 07:15
70	2018/01/03 09:45	2018/02/22 14:00	2018/03/26 12:00	2018/04/06 09:30	2018/05/01 11:30	2018/06/14 11:45	2018/07/05 08:30	2018/08/20 10:45	2018/09/17 14:45	2018/10/10 12:00	2018/11/22 11:00	2018/12/13 13:00
71	2018/01/02 15:00	2018/02/13 13:30	2018/03/21 09:15	2018/04/11 11:45	2018/05/25 10:15	2018/06/29 10:30	2018/07/12 11:00	2018/08/01 10:45		2018/10/11 11:30	2018/11/22 12:15	2018/12/27 09:30
72	2018/01/02 07:15	2018/02/01 07:15										2018/12/03 07:15
73	2018/01/29 07:30	2018/02/01 07:45	2018/03/12 07:30	2018/04/03 07:30	2018/05/17 07:30	2018/06/18 07:30	2018/07/10 07:30	2018/08/16 11:15	2018/09/24 07:30	2018/10/26 07:30	2018/11/28 08:00	2018/12/31 08:00
74	2018/01/22 13:45	2018/02/16 10:30	2018/03/02 13:30	2018/04/03 08:45	2018/05/29 10:45	2018/06/27 10:15	2018/07/26 15:15	2018/08/21 17:15	2018/09/05 13:45	2018/10/11 13:15	2018/11/20 14:45	2018/12/18 15:00
75	2018/01/25 10:30	2018/02/21 08:15	2018/03/05 13:45	2018/04/03 07:00	2018/05/15 11:00	2018/06/18 14:15	2018/07/10 13:15	2018/08/29 07:15	2018/09/13 11:00	2018/10/22 13:30	2018/11/06 11:30	2018/12/03 06:45
76	2018/01/08 11:45	2018/02/08 09:45	2018/03/19 08:45	2018/04/25 08:15	2018/05/14 08:45	2018/06/08 08:15	2018/07/03 08:15	2018/08/20 09:45	2018/09/14 08:15	2018/10/18 13:30	2018/11/16 08:15	2018/12/07 11:00
77	2018/01/25 11:00	2018/02/06 16:15	2018/03/15 11:30	2018/04/02 14:45	2018/05/30 15:15	2018/06/14 09:30	2018/07/18 14:30	2018/08/27 16:00	2018/09/13 10:45	2018/10/04 11:30	2018/11/15 14:15	2018/12/06 15:15
78	2018/01/24 13:30	2018/02/16 15:00	2018/03/07 14:45	2018/04/12 09:00	2018/05/17 11:30	2018/06/12 13:15	2018/07/23 09:00	2018/08/06 11:15	2018/09/26 09:00	2018/10/03 10:45	2018/11/06 13:30	2018/12/20 14:45
79	2018/01/27 08:15	2018/02/23 09:45	2018/03/15 15:30	2018/04/16 13:00	2018/05/29 08:00	2018/06/15 08:45	2018/07/24 08:30	2018/08/30 07:00	2018/09/21 08:45	2018/10/25 09:00	2018/11/29 12:30	2018/12/31 07:45
80	2018/01/26 10:00	2018/02/06 16:00	2018/03/09 10:00	2018/04/05 11:15	2018/05/24 15:45	2018/06/06 08:30	2018/07/13 13:30	2018/08/27 13:30	2018/09/04 11:30	2018/10/18 13:30	2018/11/27 09:45	2018/12/12 11:00
81	2018/01/16 08:00	2018/02/26 13:30	2018/03/27 08:30	2018/04/10 15:00	2018/05/28 09:45	2018/06/07 09:30	2018/07/19 14:45	2018/08/30 11:30	2018/09/25 08:30	2018/10/17 15:00	2018/11/27 10:45	2018/12/12 07:30
82	2018/01/17 19:00	2018/02/27 19:15	2018/03/04 13:15	2018/04/17 13:15	2018/05/06 12:45	2018/06/29 12:45	2018/07/07 12:45	2018/08/05 14:00	2018/09/21 12:45	2018/10/27 13:00	2018/11/26 07:15	2018/12/27 07:00
83	2018/01/17 08:00	2018/02/03 18:45	2018/03/30 16:45	2018/04/29 13:00	2018/05/07 22:30	2018/06/26 19:15	2018/07/08 19:00	2018/08/14 20:30	2018/09/28 13:00	2018/10/29 07:00	2018/11/23 12:00	2018/12/01 18:00
84	2018/01/26 11:45	2018/02/23 06:30	2018/03/09 08:00	2018/04/25 15:15	2018/05/31 08:45	2018/06/04 02:00	2018/07/10 17:00	2018/08/30 02:00	2018/09/17 09:15	2018/10/17 09:45	2018/11/23 07:15	2018/12/12 07:00
85	2018/01/15 16:15	2018/02/05 08:15	2018/03/19 10:15	2018/04/17 12:15	2018/05/08 23:45	2018/06/06 10:30	2018/07/02 01:45	2018/08/09 13:00	2018/09/26 09:15	2018/10/30 12:30	2018/11/29 15:15	2018/12/05 13:45
86	2018/01/26 08:30	2018/02/01 15:00	2018/03/12 11:15	2018/04/09 10:30	2018/05/17 10:30	2018/06/28 14:15	2018/07/04 15:45	2018/08/28 16:45	2018/09/06 13:00	2018/10/18 10:30	2018/11/05 08:45	2018/12/14 12:15
87	2018/01/22 13:00	2018/02/08 11:30	2018/03/07 16:45	2018/04/30 09:45	2018/05/01 10:15	2018/06/29 15:15	2018/07/16 09:45	2018/08/01 08:45	2018/09/18 09:30	2018/10/10 08:45	2018/11/13 09:15	2018/12/17 09:00
88	2018/01/09 12:45	2018/02/14 08:00	2018/03/25 13:00	2018/04/11 08:15	2018/05/09 10:30	2018/06/04 09:45	2018/07/04 12:45	2018/08/15 11:15	2018/09/11 14:00	2018/10/26 10:45	2018/11/30 11:45	2018/12/12 12:45
89	2018/01/10 11:15	2018/02/07 11:00	2018/03/20 10:30	2018/04/20 10:45	2018/05/16 15:30	2018/06/01 14:45	2018/07/26 09:00	2018/08/29 14:45	2018/09/18 16:00	2018/10/19 07:45	2018/11/30 13:30	2018/12/21 16:15
90	2018/01/24 11:45	2018/02/02 11:00	2018/03/09 14:15	2018/04/23 14:00	2018/05/07 14:00	2018/06/13 10:45	2018/07/17 13:15	2018/08/13 10:45	2018/09/18 13:15	2018/10/22 10:30	2018/11/30 15:15	2018/12/04 10:45
91	2018/01/24 13:30	2018/02/12 01:30	2018/03/08 13:45	2018/04/17 11:45	2018/05/03 14:45	2018/06/21 15:00	2018/07/23 14:45	2018/08/14 05:15	2018/09/06 14:45	2018/10/23 11:45	2018/11/27 12:00	2018/12/26 22:15
92	2018/01/26 08:45	2018/02/13 08:15	2018/03/20 07:45	2018/04/06 10:00	2018/05/04 08:45	2018/06/05 09:45	2018/07/04 14:15	2018/08/07 14:15	2018/09/18 13:15	2018/10/19 07:45	2018/11/23 07:45	2018/12/14 09:30
93	2018/01/31 08:15	2018/02/14 08:00	2018/03/07 08:00	2018/04/06 08:00	2018/05/01 08:00	2018/06/05 08:00	2018/07/26 09:00	2018/08/15 08:00	2018/09/21 08:00	2018/10/26 08:00	2018/11/15 08:00	2018/12/13 08:00
94	2018/01/11 08:00	2018/02/08 12:45	2018/03/13 12:30	2018/04/16 08:30	2018/05/25 09:15	2018/06/21 11:00	2018/07/03 08:15	2018/08/31 09:00	2018/09/18 10:30	2018/10/11 08:45	2018/11/23 08:30	2018/12/11 07:45
95	2018/01/19 14:30	2018/02/14 13:15	2018/03/27 11:30	2018/04/17 10:00	2018/05/31 06:45	2018/06/26 10:00	2018/07/17 13:00	2018/08/15 16:15	2018/09/19 14:45	2018/10/22 10:30	2018/11/20 16:00	2018/12/07 10:15
96	2018/01/14 09:15	2018/02/12 11:30	2018/03/01 11:15	2018/04/03 10:30	2018/05/21 12:30	2018/06/02 16:30	2018/07/24 16:00	2018/08/08 14:00	2018/09/12 11:45	2018/10/01 11:45	2018/11/19 13:45	2018/12/05 13:45
97	2018/01/26 07:30	2018/02/13 07:30	2018/03/13 07:15	2018/04/05 06:30	2018/05/14 13:15	2018/06/19 07:00	2018/07/18 07:30	2018/08/09 07:30	2018/09/12 02:45	2018/10/31 06:45	2018/11/22 05:30	2018/12/12 07:15
98	2018/01/28 02:00	2018/02/11 02:45	2018/03/29 12:30	2018/04/22 09:30	2018/05/25 01:15	2018/06/04 03:15	2018/07/10 17:30	2018/08/08 07:30	2018/09/17 00:30	2018/10/19 05:45	2018/11/01 15:00	2018/12/17 13:00
99	2018/01/31 22:45	2018/02/04 00:30	2018/03/31 23:00	2018/04/20 14:15	2018/05/02 05:45	2018/06/15 10:00	2018/07/11 08:45	2018/08/01 15:00	2018/09/03 19:45	2018/10/18 19:15	2018/11/14 03:15	2018/12/12 21:30
100	2018/01/01 15:15	2018/02/04 03:00	2018/03/19 00:15	2018/04/16 22:00	2018/05/27 06:00	2018/06/13 04:45	2018/07/08 09:15	2018/08/25 14:00	2018/09/09 00:15	2018/10/12 03:15	2018/11/30 04:00	2018/12/06 01:00
101	2018/01/02 08:00	2018/02/09 08:00	2018/03/19 09:00	2018/04/03 09:15	2018/05/24 08:45	2018/06/07 09:15	2018/07/23 08:00	2018/08/14 08:15	2018/09/17 09:30	2018/10/23 08:00	2018/11/22 09:15	2018/12/13 08:30
102	2018/01/23 11:30	2018/02/13 10:15	2018/03/14 14:00	2018/04/26 13:15	2018/05/22 13:45	2018/06/04 10:00	2018/07/13 13:00	2018/08/07 09:15	2018/09/24 11:30	2018/10/31 15:30	2018/11/30 13:30	2018/12/11 13:45
103	2018/01/24 11:45	2018/02/12 05:30	2018/03/14 17:30									

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
111	2018/01/22 07:45	2018/02/22 13:45	2018/03/22 14:00	2018/04/06 11:00	2018/05/03 10:00	2018/06/04 09:30	2018/07/13 09:15	2018/08/03 08:45	2018/09/28 12:00	2018/10/19 09:30	2018/11/10 08:30	2018/12/07 08:15
112	2018/01/25 10:15	2018/02/23 09:00	2018/03/20 11:45	2018/04/17 14:15	2018/05/01 11:00	2018/06/27 09:45	2018/07/19 10:00	2018/08/01 11:15	2018/09/28 10:45	2018/10/18 09:30	2018/11/14 20:45	2018/12/05 09:15
113	2018/01/30 00:15	2018/02/03 06:45	2018/03/14 03:30	2018/04/16 08:00	2018/05/01 07:45	2018/06/05 07:45	2018/07/06 21:45	2018/08/16 22:30	2018/09/16 19:45	2018/10/26 23:15	2018/11/27 23:00	2018/12/31 11:00
114	2018/01/24 22:15	2018/02/05 23:30	2018/03/25 20:45	2018/04/22 06:00	2018/05/02 06:00	2018/06/06 14:30	2018/07/03 08:45	2018/08/21 13:00	2018/09/21 06:45	2018/10/19 07:15	2018/11/22 17:15	2018/12/29 19:15
115	2018/01/22 08:30	2018/02/12 09:30	2018/03/21 10:45	2018/04/16 11:00	2018/05/29 16:15	2018/06/12 14:45	2018/07/20 14:45	2018/08/02 14:30	2018/09/14 14:00	2018/10/04 08:30	2018/11/14 11:00	2018/12/07 11:00
116	2018/01/28 18:30	2018/02/04 01:00	2018/03/19 07:30	2018/04/13 08:30	2018/05/04 11:00	2018/06/11 16:45	2018/07/12 07:30	2018/08/31 07:15	2018/09/24 10:15	2018/10/25 11:00	2018/11/19 07:15	2018/12/31 07:15
117	2018/01/29 11:15	2018/02/21 10:45	2018/03/15 07:30	2018/04/26 16:00	2018/05/28 09:00	2018/06/27 08:00	2018/07/24 11:15	2018/08/22 12:00	2018/09/18 16:30	2018/10/30 11:00	2018/11/15 10:30	2018/12/05 10:45
118	2018/01/23 09:45	2018/02/13 13:30	2018/03/08 18:45	2018/04/04 08:45	2018/05/17 11:00	2018/06/05 10:30	2018/07/27 14:15	2018/08/29 14:15	2018/09/04 11:00	2018/10/26 10:00	2018/11/23 10:45	2018/12/13 09:30
119		2018/02/09 22:00	2018/03/11 23:15	2018/04/28 11:15	2018/05/31 14:45	2018/06/01 22:00	2018/07/27 23:00	2018/08/04 21:30	2018/09/22 13:30	2018/10/16 19:15	2018/11/07 16:45	2018/12/05 20:45
120	2018/01/10 07:30	2018/02/28 10:00	2018/03/28 08:30	2018/04/18 06:30	2018/05/30 09:15	2018/06/13 10:15	2018/07/25 09:15	2018/08/15 11:15	2018/09/27 04:30	2018/10/24 09:15	2018/11/07 01:30	2018/12/03 08:30
121	2018/01/12 07:00	2018/02/22 20:30	2018/03/19 09:45	2018/04/23 09:45	2018/05/08 06:45	2018/06/29 07:45	2018/07/31 09:30	2018/08/21 09:15	2018/09/05 07:45	2018/10/31 14:30	2018/11/23 10:30	2018/12/11 18:00
122	2018/01/18 19:00	2018/02/13 20:30	2018/03/12 18:30	2018/04/03 17:00	2018/05/17 14:15	2018/06/10 07:30	2018/07/02 20:15	2018/08/22 21:45	2018/09/27 14:30	2018/10/31 05:00	2018/11/21 21:00	2018/12/12 02:15
123	2018/01/18 14:00	2018/02/08 21:00	2018/03/26 17:00	2018/04/27 13:00	2018/05/16 17:00	2018/06/09 18:15	2018/07/03 03:15	2018/08/01 23:15	2018/09/11 18:45	2018/10/24 23:15	2018/11/14 12:00	2018/12/13 20:15
124	2018/01/10 08:00	2018/02/14 08:15	2018/03/02 08:45	2018/04/03 08:45	2018/05/10 09:15	2018/06/15 09:30	2018/07/05 11:15	2018/08/14 11:15	2018/09/17 08:45	2018/10/10 11:00	2018/11/28 09:30	2018/12/13 11:30
125	2018/01/03 09:45	2018/02/08 11:15	2018/03/27 09:15	2018/04/03 09:15	2018/05/14 14:00	2018/06/05 11:30	2018/07/04 13:45	2018/08/14 09:00	2018/09/11 14:00	2018/10/18 15:15	2018/11/23 13:15	2018/12/28 09:15
126	2018/01/19 09:30	2018/02/06 07:30	2018/03/13 15:45	2018/04/05 20:00	2018/05/07 17:00	2018/06/21 15:30	2018/07/17 18:30	2018/08/23 13:30	2018/09/06 11:15	2018/10/02 02:15	2018/11/01 04:45	2018/12/11 23:00
127	2018/01/04 13:45	2018/02/09 11:45	2018/03/11 06:45	2018/04/07 23:45	2018/05/03 13:30	2018/06/06 13:15	2018/07/01 01:00	2018/08/02 11:15	2018/09/25 10:15	2018/10/13 22:15	2018/11/12 01:15	2018/12/21 10:00
128	2018/01/13 12:30	2018/02/21 18:15	2018/03/03 09:45	2018/04/04 08:30	2018/05/25 13:00	2018/06/01 12:15	2018/07/29 12:00	2018/08/29 16:45	2018/09/05 15:15	2018/10/04 08:45	2018/11/02 15:00	2018/12/22 09:45
129	2018/01/03 06:15	2018/02/06 06:30	2018/03/02 12:45	2018/04/10 06:30	2018/05/04 10:00	2018/06/05 05:45	2018/07/11 11:15	2018/08/23 05:30	2018/09/18 14:45	2018/10/22 09:00	2018/11/23 22:00	2018/12/06 07:45
131	2018/01/08 16:45	2018/02/07 16:15	2018/03/06 21:45	2018/04/20 21:45	2018/05/17 14:15	2018/06/11 18:30	2018/07/27 09:45	2018/08/22 16:30	2018/09/28 08:45	2018/10/15 11:15	2018/11/13 11:00	2018/12/10 20:45
132	2018/01/02 09:45	2018/02/27 10:45	2018/03/19 10:45	2018/04/30 12:30	2018/05/02 11:15	2018/06/04 07:45	2018/07/31 13:15	2018/08/16 11:45	2018/09/10 07:45	2018/10/23 08:30	2018/11/15 11:45	2018/12/12 11:00
133	2018/01/12 12:00	2018/02/24 22:30	2018/03/29 14:30	2018/04/02 13:30	2018/05/18 12:30	2018/06/02 02:45	2018/07/23 15:00	2018/08/06 13:00	2018/09/05 10:30	2018/10/10 07:15	2018/11/30 22:45	2018/12/01 03:30
134	2018/01/11 12:00	2018/02/13 14:45	2018/03/02 12:00	2018/04/30 14:15	2018/05/24 13:15	2018/06/25 15:30	2018/07/25 11:30	2018/08/22 11:45	2018/09/12 10:00	2018/10/05 12:00	2018/11/02 12:00	2018/12/06 11:15
135	2018/01/15 07:45	2018/02/13 05:45	2018/03/24 12:00	2018/04/29 16:15	2018/05/24 22:00	2018/06/01 18:15	2018/07/21 17:45	2018/08/18 16:15	2018/09/16 18:00	2018/10/12 02:00	2018/11/22 07:30	2018/12/01 14:15
136	2018/01/23 09:30	2018/02/27 15:00	2018/03/26 12:30	2018/04/03 08:45	2018/05/09 12:00	2018/06/19 16:15	2018/07/10 12:45	2018/08/23 15:00	2018/09/20 11:45	2018/10/15 11:45	2018/11/22 18:30	2018/12/12 13:15
137	2018/01/09 11:45	2018/02/22 09:45	2018/03/27 09:30	2018/04/05 10:15	2018/05/23 10:00	2018/06/13 09:00	2018/07/24 09:30	2018/08/01 11:45	2018/09/27 09:30	2018/10/17 09:45	2018/11/07 11:30	2018/12/05 09:30
138	2018/01/16 21:00	2018/02/13 18:45	2018/03/13 11:30	2018/04/03 08:45	2018/05/10 15:00	2018/06/05 21:15	2018/07/31 09:30	2018/08/16 15:30	2018/09/03 09:45	2018/10/30 09:45	2018/11/20 23:30	2018/12/13 08:45
139	2018/01/03 08:30	2018/02/09 12:15	2018/03/07 12:45	2018/04/24 14:30	2018/05/11 09:15	2018/06/01 13:00	2018/07/24 12:45	2018/08/28 17:45	2018/09/06 17:00	2018/10/16 06:45	2018/11/07 03:30	2018/12/06 11:15
140	2018/01/16 17:15	2018/02/14 22:30	2018/03/07 19:00	2018/04/09 12:45	2018/05/16 12:45	2018/06/14 20:30				2018/10/23 22:45	2018/11/22 04:00	2018/12/18 21:00
141	2018/01/19 12:00	2018/02/23 08:30	2018/03/27 08:00	2018/04/20 08:00	2018/05/01 08:45	2018/06/05 12:00	2018/07/27 09:00	2018/08/09 13:00	2018/09/22 17:00	2018/10/23 16:45	2018/11/13 14:00	2018/12/05 09:15
142	2018/01/31 09:15	2018/02/06 23:00	2018/03/08 09:30	2018/04/20 05:15	2018/05/04 08:30	2018/06/16 08:15	2018/07/12 18:45	2018/08/22 17:45	2018/09/12 09:15	2018/10/24 20:30	2018/11/08 00:15	2018/12/03 08:15
143	2018/01/05 19:15	2018/02/06 09:00	2018/03/20 15:30	2018/04/17 09:45	2018/05/03 11:15	2018/06/19 11:00	2018/07/25 13:30	2018/08/28 17:45	2018/09/11 22:30	2018/10/24 14:30	2018/11/23 04:00	2018/12/10 22:15
144	2018/01/08 13:45	2018/02/02 16:15	2018/03/22 10:00	2018/04/30 18:00	2018/05/01 11:30	2018/06/28 10:45	2018/07/19 12:30	2018/08/17 12:30	2018/09/06 10:45	2018/10/20 19:30	2018/11/29 08:15	2018/12/28 12:30
145	2018/01/16 11:00	2018/02/01 09:00	2018/03/01 07:30	2018/04/09 17:45	2018/05/30 10:00	2018/06/07 05:45	2018/07/25 10:00	2018/08/21 17:45	2018/09/20 11:45	2018/10/24 05:45	2018/11/05 05:30	2018/12/17 05:45
146	2018/01/23 11:30	2018/02/24 07:45	2018/03/01 17:45	2018/04/10 06:30	2018/05/30 11:30	2018/06/07 06:30	2018/07/17 14:00	2018/08/13 13:15	2018/09/07 14:15	2018/10/25 18:30	2018/11/15 07:15	2018/12/20 09:15
147	2018/01/29 22:45	2018/02/02 22:15	2018/03/08 04:30	2018/04/28 14:45	2018/05/31 14:30	2018/06/29 11:30	2018/07/30 15:45	2018/08/22 00:00	2018/09/18 16:45	2018/10/03 15:45	2018/11/03 11:00	2018/12/12 23:30
148	2018/01/03 06:45	2018/02/13 09:15	2018/03/06 06:45	2018/04/10 06:45	2018/05/23 13:45	2018/06/20 19:15	2018/07/19 09:00	2018/08/14 11:15	2018/09/19 11:30	2018/10/19 09:30	2018/11/14 15:00	2018/12/04 13:30
149	2018/01/12 12:15	2018/02/01 14:00	2018/03/05 08:45	2018/04/19 01:15	2018/05/01 00:45	2018/06/01 08:30	2018/07/31 13:30	2018/08/16 13:30	2018/09/28 11:15	2018/10/15 08:45	2018/11/23 12:45	2018/12/14 07:15
150	2018/01/10 14:45	2018/02/14 14:15	2018/03/19 12:15	2018/04/02 12:15	2018/05/29 20:30	2018/06/22 11:45	2018/07/04 12:30	2018/08/08 17:00	2018/09/12 14:45	2018/10/09 19:45	2018/11/01 14:30	2018/12/12 07:30
151	2018/01/11 11:30	2018/02/07 11:15	2018/03/22 11:15	2018/04/04 14:45	2018/05/29 11:15	2018/06/19 10:45	2018/07/03 10:00	2018/08/14 07:30	2018/09/21 12:15	2018/10/02 13:15	2018/11/19 13:30	2018/12/14 14:15
152	2018/01/08 10:15	2018/02/07 18:30	2018/03/26 20:15	2018/04/10 09:15	2018/05/01 07:30	2018/06/12 03:00	2018/07/15 20:30	2018/08/12 19:00	2018/09/25 10:00	2018/10/18 20:00	2018/11/19 10:00	2018/12/05 21:45
153	2018/01/03 08:30	2018/02/14 08:30	2018/03/14 18:45	2018/04/09 08:45	2018/05/20 14:15	2018/06/05 09:00	2018/07/23 12:15	2018/08/10 11:30	2018/09/25 09:15	2018/10/27 09:30	2018/11/29 13:15	2018/12/31 10:15
154	2018/01/02 18:30	2018/02/03 09:30	2018/03/14 13:45	2018/04/10 08:00	2018/05/20 16:45	2018/06/05 13:30	2018/07/31 10:30	2018/08/30 20:30	2018/09/18 22:15	2018/10/16 08:45	2018/11/29 13:15	2018/12/08 08:30
155	2018/01/06 18:00	2018/02/03 18:30	2018/03/14 18:45	2018/04/10 07:00	2018/05/20 14:15	2018/06/05 09:45	2018/07/28 11:30	2018/08/30 20:45	2018/09/12 01:45	2018/10/27 08:30	2018/11/29 13:15	2018/12/28 17:45
156	2018/01/07 17:45	2018/02/03 19:00	2018/03/19 09:15	2018/04/06 10:15	2018/05/04 11:30	2018/06/06 11:45	2018/07/25 14:00	2018/08/07 14:45	2018/09/06 14:45	2018/10/24 10:30	2018/11/23 09:15	2018/12/12 09:15
157	2018/01/29 10:30	2018/02/14 10:15	2018/03/21 11:30	2018/04/30 11:30	2018/05/15 11:30	2018/06/28 11:15	2018/07/25 10:45	2018/08/01 10:00	2018/09/06 14:30	2018/10/04 13:45	2018/11/19 10:15	2018/12/17 10:30
158	2018/01/07 17:45	2018/02										

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
174	2018/01/29 09:45	2018/02/22 10:30	2018/03/06 09:00	2018/04/06 13:00	2018/05/31 15:15	2018/06/01 12:00	2018/07/25 10:45	2018/08/30 09:45	2018/09/25 09:45	2018/10/09 10:00	2018/11/23 11:00	2018/12/12 10:45
175	2018/01/25 13:30	2018/02/09 10:30	2018/03/21 11:15	2018/04/17 11:15	2018/05/01 12:45	2018/06/28 09:15	2018/07/03 16:00	2018/08/07 08:30	2018/09/17 10:15	2018/10/04 13:45	2018/11/28 11:00	2018/12/05 15:30
177	2018/01/22 09:45	2018/02/23 08:30	2018/03/20 10:15	2018/04/10 09:15	2018/05/31 13:15	2018/06/01 12:30	2018/07/05 10:00	2018/08/30 11:30	2018/09/17 11:45	2018/10/15 09:15	2018/11/13 10:00	2018/12/13 09:15
178	2018/01/26 21:15	2018/02/07 12:15	2018/03/02 11:15	2018/04/27 12:15	2018/05/02 11:00	2018/06/05 10:15	2018/07/03 14:15	2018/08/17 13:45	2018/09/27 11:30	2018/10/25 11:30	2018/11/02 11:30	2018/12/21 11:45
179	2018/01/08 09:45	2018/02/13 10:00	2018/03/19 09:45	2018/04/10 11:15	2018/05/01 09:45	2018/06/15 11:15	2018/07/25 13:00	2018/08/28 11:00	2018/09/18 11:30	2018/10/26 11:15	2018/11/16 11:00	2018/12/10 13:15
180	2018/01/26 11:15	2018/02/09 10:00	2018/03/26 10:00	2018/04/10 10:00	2018/05/30 11:45	2018/06/19 14:00	2018/07/05 11:00	2018/08/29 10:15	2018/09/04 10:45	2018/10/26 10:30	2018/11/29 11:30	2018/12/11 10:45
181	2018/01/10 10:45	2018/02/08 10:00	2018/03/19 13:00	2018/04/09 10:00	2018/05/29 11:45	2018/06/06 09:00	2018/07/25 09:45	2018/08/30 13:15	2018/09/11 12:30	2018/10/23 10:30	2018/11/22 09:45	2018/12/05 10:15
182	2018/01/31 11:00	2018/02/06 10:30	2018/03/01 10:45	2018/04/11 11:00	2018/05/11 14:45	2018/06/20 12:15	2018/07/05 11:00	2018/08/29 14:15	2018/09/25 09:15	2018/10/01 09:45	2018/11/14 08:45	2018/12/13 10:45
183	2018/01/08 09:30	2018/02/01 01:15	2018/03/19 09:00	2018/04/27 11:00	2018/05/09 10:15	2018/06/04 11:45	2018/07/31 11:00	2018/08/24 11:30	2018/09/13 11:45	2018/10/03 09:00	2018/11/19 09:00	2018/12/13 09:00
184	2018/01/14 21:00	2018/02/23 04:30	2018/03/02 22:15	2018/04/12 22:45	2018/05/16 22:15	2018/06/02 05:00	2018/07/01 21:30	2018/08/13 03:15	2018/09/21 22:15	2018/10/31 21:15	2018/11/09 22:30	2018/12/09 02:15
185	2018/01/02 15:45	2018/02/03 10:15	2018/03/19 10:15	2018/04/11 09:15	2018/05/01 11:45	2018/06/06 10:45	2018/07/24 10:30	2018/08/02 14:45	2018/09/14 16:30	2018/10/22 10:00	2018/11/23 08:15	2018/12/27 11:30
186	2018/01/08 17:15	2018/02/23 22:00	2018/03/25 04:45	2018/04/09 02:30	2018/05/04 08:00	2018/06/04 09:30	2018/07/28 03:15	2018/08/02 20:45	2018/09/18 01:00	2018/10/27 08:15	2018/11/18 15:45	2018/12/20 20:30
187	2018/01/26 09:00	2018/02/08 13:30	2018/03/12 11:30	2018/04/02 09:30	2018/05/12 08:15	2018/06/12 13:00	2018/07/06 16:00	2018/08/13 09:30	2018/09/10 13:00	2018/10/11 16:00	2018/11/09 11:30	2018/12/12 16:45
188	2018/01/06 20:30	2018/02/03 19:45	2018/03/20 14:30	2018/04/27 13:15	2018/05/12 10:45	2018/06/11 08:45	2018/07/16 11:45	2018/08/23 18:45	2018/09/10 14:15	2018/10/09 17:00	2018/11/02 08:45	2018/12/11 15:45
189	2018/01/06 10:45	2018/02/01 08:15	2018/03/13 22:00	2018/04/09 09:45	2018/05/13 01:00	2018/06/03 22:00	2018/07/29 09:45	2018/08/05 12:45	2018/09/25 07:00	2018/10/19 07:00	2018/11/19 03:30	2018/12/31 02:15
190	2018/01/23 15:30	2018/02/28 14:45	2018/03/01 12:30	2018/04/04 12:00	2018/05/31 12:00	2018/06/20 12:30	2018/07/04 12:15	2018/08/08 15:00	2018/09/17 11:30	2018/10/10 10:45	2018/11/22 12:15	2018/12/20 11:30
191	2018/01/26 15:30	2018/02/23 11:30	2018/03/15 13:30	2018/04/03 15:30	2018/05/31 10:30	2018/06/05 09:45	2018/07/13 14:15	2018/08/02 15:30	2018/09/21 13:00	2018/10/18 14:30	2018/11/01 13:30	2018/12/07 14:30
192	2018/01/29 13:15	2018/02/22 09:00	2018/03/15 11:45	2018/04/18 13:15	2018/05/25 10:30	2018/06/06 11:45	2018/07/26 11:00	2018/08/29 13:15	2018/09/18 09:45	2018/10/31 11:15	2018/11/13 08:30	2018/12/17 11:45
193	2018/01/31 10:30	2018/02/02 13:15	2018/03/20 10:00	2018/04/02 10:00	2018/05/23 10:00	2018/06/06 10:00	2018/07/04 13:00	2018/08/30 13:45	2018/09/25 08:00	2018/10/31 10:30	2018/11/19 09:45	2018/12/11 10:00
194	2018/01/22 13:15	2018/02/06 10:15	2018/03/02 11:30	2018/04/03 09:00	2018/05/04 09:15	2018/06/21 12:30	2018/07/20 10:45	2018/08/21 13:30	2018/09/24 15:30	2018/10/05 08:15	2018/11/23 16:15	2018/12/20 09:15
195	2018/01/31 09:45	2018/02/02 06:00	2018/03/07 20:45	2018/04/04 18:45	2018/05/02 10:00	2018/06/13 15:45	2018/07/31 15:15	2018/08/02 12:15	2018/09/06 16:30	2018/10/09 11:45	2018/11/23 05:00	2018/12/18 13:15
196	2018/01/25 00:00	2018/02/07 10:30	2018/03/08 11:30	2018/04/30 22:30	2018/05/01 07:15	2018/06/27 14:45	2018/07/10 15:15	2018/08/23 14:15	2018/09/27 10:00	2018/10/17 12:00	2018/11/27 15:45	2018/12/07 08:45
197	2018/01/13 09:30	2018/02/05 09:45	2018/03/29 08:45	2018/04/30 10:30	2018/05/15 18:00	2018/06/28 18:15	2018/07/24 14:00	2018/08/29 17:00	2018/09/14 16:30	2018/10/23 15:00	2018/11/03 14:15	2018/12/13 12:15
198	2018/01/26 12:30	2018/02/01 14:15	2018/03/01 11:15	2018/04/03 09:45	2018/05/10 13:15	2018/06/05 10:45	2018/07/24 14:45	2018/08/08 13:45	2018/09/26 12:15	2018/10/31 12:00	2018/11/22 11:00	2018/12/06 12:15
199	2018/01/07 17:00	2018/02/17 17:45	2018/03/01 19:45	2018/04/10 21:30	2018/05/31 20:45	2018/06/01 20:30	2018/07/28 20:45	2018/08/09 19:30	2018/09/04 08:30	2018/10/20 18:30	2018/11/03 18:00	2018/12/13 19:00
200					2018/05/24 09:15	2018/06/28 11:45	2018/07/23 15:15	2018/08/09 15:30	2018/09/20 08:45	2018/10/05 08:30	2018/11/22 17:30	2018/12/27 13:30
201					2018/05/27 09:15	2018/06/03 09:15	2018/07/23 14:45	2018/08/06 14:30	2018/09/07 07:15	2018/10/26 11:15	2018/11/29 14:15	2018/12/31 09:15
202					2018/05/29 12:00	2018/06/30 15:00	2018/07/05 15:00	2018/08/07 15:15	2018/09/12 11:00	2018/10/12 21:00	2018/11/26 19:45	2018/12/22 16:45
203					2018/05/18 07:15	2018/06/30 14:00	2018/07/25 14:45	2018/08/07 13:00	2018/09/06 14:15	2018/10/27 08:00	2018/11/29 14:00	2018/12/28 09:30
204					2018/05/29 16:00	2018/06/04 07:00	2018/07/04 16:00	2018/08/16 12:30	2018/09/06 14:00	2018/10/27 08:30	2018/11/22 17:45	2018/12/13 09:15
205					2018/05/24 08:00	2018/06/30 12:00	2018/07/05 15:30	2018/08/07 18:15	2018/09/06 15:45	2018/10/26 10:00	2018/11/29 16:00	2018/12/27 09:30
206					2018/05/30 11:00	2018/06/25 18:45	2018/07/20 07:00	2018/08/03 16:30	2018/09/20 19:15	2018/10/27 20:00	2018/11/29 16:45	2018/12/01 20:15
207					2018/05/30 01:15	2018/06/25 20:15	2018/07/04 07:00	2018/08/31 16:45	2018/09/04 17:00	2018/10/25 20:45	2018/11/29 15:45	2018/12/28 17:30
208												2018/12/06 13:45
209												2018/12/05 12:45
210	2018/01/23 11:00	2018/02/06 15:30	2018/03/19 15:45	2018/04/25 15:30	2018/05/31 11:15	2018/06/19 11:15	2018/07/24 11:30	2018/08/14 11:00	2018/09/12 11:00	2018/10/09 11:45	2018/11/19 16:00	2018/12/05 11:30
211	2018/01/15 12:15	2018/02/09 11:00	2018/03/12 12:00	2018/04/17 11:00	2018/05/31 13:30	2018/06/30 16:00	2018/07/31 12:15	2018/08/03 13:30	2018/09/14 12:15	2018/10/10 11:00	2018/11/03 11:45	2018/12/22 10:00
212	2018/01/07 09:00	2018/02/03 08:30	2018/03/17 22:30	2018/04/06 09:30	2018/05/25 07:15	2018/06/05 07:15	2018/07/05 11:30	2018/08/03 15:00	2018/09/25 07:30	2018/10/01 07:15	2018/11/23 07:15	2018/12/28 07:15
213	2018/01/05 17:15	2018/02/13 08:15	2018/03/14 09:00	2018/04/09 07:15	2018/05/19 07:15	2018/06/14 07:15	2018/07/04 15:30	2018/08/31 07:15	2018/09/25 07:15	2018/10/06 07:15	2018/11/29 17:30	2018/12/27 10:30
214	2018/01/07 11:00	2018/02/12 11:00	2018/03/26 11:00	2018/04/17 11:00	2018/05/31 11:00	2018/06/29 15:45	2018/07/24 11:00	2018/08/08 11:15	2018/09/06 16:00	2018/10/01 10:45	2018/11/22 11:00	2018/12/13 11:15
215	2018/01/09 13:30	2018/02/12 07:00	2018/03/05 09:45	2018/04/14 16:30	2018/05/12 23:00	2018/06/30 10:45	2018/07/22 14:00	2018/08/02 04:45	2018/09/30 09:45	2018/10/03 06:45	2018/11/19 03:45	2018/12/25 17:30
216	2018/01/03 17:00	2018/02/13 20:30	2018/03/15 17:30	2018/04/10 18:00	2018/05/04 11:15	2018/06/18 16:30	2018/07/14 09:15	2018/08/02 17:45	2018/09/17 20:30	2018/10/18 22:00	2018/11/13 13:45	2018/12/04 19:30
217	2018/01/13 11:45	2018/02/08 09:15	2018/03/24 09:00	2018/04/30 09:15	2018/05/09 09:15	2018/06/30 15:45	2018/07/04 14:45	2018/08/29 16:15	2018/09/05 13:45	2018/10/10 16:30	2018/11/29 12:45	2018/12/09 09:00
218	2018/01/06 08:15	2018/02/23 07:45	2018/03/19 07:30	2018/04/06 07:45	2018/05/14 06:00	2018/06/01 14:00	2018/07/23 15:15	2018/08/02 14:00	2018/09/17 14:45	2018/10/23 06:00	2018/11/22 11:45	2018/12/11 08:15
219	2018/01/04 21:15	2018/02/13 07:45	2018/03/17 21:45	2018/04/08 21:00	2018/05/31 15:30	2018/06/01 20:00	2018/07/26 17:00	2018/08/04 15:45	2018/09/15 15:45	2018/10/18 21:45	2018/11/22 22:00	2018/12/08 22:30
220	2018/01/17 20:45	2018/02/09 19:15	2018/03/05 17:15	2018/04/09 16:15	2018/05/03 19:45	2018/06/18 17:00	2018/07/24 18:30	2018/08/15 14:30	2018/09/28 09:15	2018/10/26 20:30	2018/11/01 18:15	2018/12/15 13:30
221	2018/01/13 16:00	2018/02/07 10:15	2018/03/27 17:00	2018/04/27 15:30	2018/05/31 16:00	2018/06/30 16:30	2018/07/04 16:45	2018/08/30 14:00	2018/09/06 17:15	2018/10/10 10:30	2018/11/03 15:00	2018/12/22 14:15
222	2018/01/02 13:00	2018/02/01 10:30	2018/03/19 09:00	2018/04/10 06:30	2018/05/29 15:15	2018/06/19 13:15	2018/07/04 13:15	2018/08/30 14:00	2018/09/27 06:15	2018/10/10 10:45	2018/11/29 12:45	2018/12/13 09:00
223	2018/01/18 11:45	2018/02/01 16:15	2018/03/08 11:45	2018/04/01 06:15	2018/05/18 16:45	2018/06/06 10:15	2018/07/27 11:45	2018/08/31 14:30	2018/09/22 08:30	2018/10/15 08:45	2018/11/29 15:45	2018/12/13 05:00
224	2018/01/08 08:45	2018/02/01 11:15	2018/03/19 11:45	2018/04/23 11:30								

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
230	2018/01/11 14:15	2018/02/12 12:45	2018/03/19 15:45	2018/04/23 15:30	2018/05/29 12:30	2018/06/01 16:45	2018/07/24 12:15	2018/08/30 14:30	2018/09/06 16:30	2018/10/03 19:00	2018/11/03 15:30	2018/12/03 12:15
231	2018/01/03 17:15	2018/02/27 07:45	2018/03/16 18:45	2018/04/06 10:45	2018/05/30 17:15	2018/06/29 14:15	2018/07/23 14:15	2018/08/07 14:00	2018/09/12 15:00	2018/10/05 20:45	2018/11/28 19:00	2018/12/11 19:00
232	2018/01/04 21:15	2018/02/09 11:15	2018/03/14 07:45	2018/04/03 14:00	2018/05/08 07:30	2018/06/14 08:30	2018/07/25 15:30	2018/08/03 12:30	2018/09/19 14:30	2018/10/26 14:30	2018/11/14 13:45	2018/12/14 17:15
233	2018/01/23 09:30	2018/02/27 09:45	2018/03/27 09:45	2018/04/16 15:15	2018/05/18 13:00	2018/06/07 13:45	2018/07/18 10:45	2018/08/07 13:15	2018/09/18 13:45	2018/10/04 13:30	2018/11/13 13:15	2018/12/08 08:30
234	2018/01/23 09:30	2018/02/13 09:30	2018/03/20 09:15	2018/04/12 09:45	2018/05/31 10:30	2018/06/27 13:45	2018/07/25 13:15	2018/08/15 13:30	2018/09/06 13:30	2018/10/04 10:15	2018/11/27 09:15	2018/12/13 09:45
235	2018/01/25 10:00	2018/02/13 10:00	2018/03/01 10:15	2018/04/24 13:45	2018/05/08 13:45	2018/06/13 12:45	2018/07/06 14:00	2018/08/30 10:15	2018/09/06 14:15	2018/10/16 10:00	2018/11/27 10:00	2018/12/19 14:00
236	2018/01/04 08:15	2018/02/13 08:45	2018/03/01 09:30	2018/04/17 09:45	2018/05/31 10:15	2018/06/20 10:30	2018/07/03 15:15	2018/08/29 09:30	2018/09/06 14:45	2018/10/04 10:15	2018/11/27 10:00	2018/12/18 10:00
237	2018/01/23 09:30	2018/02/08 10:00	2018/03/01 09:45	2018/04/24 09:45	2018/05/31 11:45	2018/06/27 15:15	2018/07/18 13:15	2018/08/15 14:30	2018/09/06 09:30	2018/10/29 07:45	2018/11/07 07:45	2018/12/10 09:30
238	2018/01/26 11:00	2018/02/23 11:30	2018/03/26 14:00	2018/04/06 14:00	2018/05/02 11:15	2018/06/27 11:30	2018/07/26 11:45	2018/08/10 11:00	2018/09/04 11:00	2018/10/04 14:15	2018/11/19 08:45	2018/12/28 11:30
239	2018/01/02 10:15	2018/02/23 10:00	2018/03/08 09:15	2018/04/20 09:45	2018/05/07 11:15	2018/06/30 18:45	2018/07/04 09:45	2018/08/29 09:00	2018/09/17 17:00	2018/10/26 09:15	2018/11/13 08:45	2018/12/10 11:30
240	2018/01/26 10:45	2018/02/03 08:45	2018/03/17 15:15	2018/04/06 12:00	2018/05/15 15:15	2018/06/30 15:45	2018/07/17 16:45	2018/08/15 16:15	2018/09/14 16:30	2018/10/26 18:30	2018/11/22 18:00	2018/12/27 19:30
241	2018/01/07 17:30	2018/02/23 11:15	2018/03/17 09:30	2018/04/20 10:00	2018/05/15 13:45	2018/06/27 13:45	2018/07/03 13:30	2018/08/23 11:30	2018/09/12 10:30	2018/10/28 13:45	2018/11/08 11:30	2018/12/04 11:45
242	2018/01/02 08:30	2018/02/13 09:45	2018/03/08 08:30	2018/04/06 17:15	2018/05/31 16:45	2018/06/30 15:15	2018/07/27 16:30	2018/08/07 15:45	2018/09/14 16:00	2018/10/04 12:30	2018/11/23 13:15	2018/12/22 16:15
243	2018/01/04 12:30	2018/02/03 07:30	2018/03/13 00:00	2018/04/13 08:45	2018/05/27 08:30	2018/06/06 08:30	2018/07/05 08:45	2018/08/07 17:00	2018/09/24 08:30	2018/10/16 09:00	2018/11/29 13:15	2018/12/28 14:15
244	2018/01/13 17:15	2018/02/21 13:45	2018/03/29 16:15	2018/04/28 16:45	2018/05/31 15:15	2018/06/01 15:00	2018/07/06 14:15	2018/08/07 17:00	2018/09/06 16:00	2018/10/28 15:45	2018/11/03 15:00	2018/12/22 13:15
245	2018/01/03 08:00	2018/02/04 07:45	2018/03/14 07:45	2018/04/04 08:00	2018/05/01 08:45	2018/06/28 07:45	2018/07/05 08:45	2018/08/30 15:00	2018/09/28 07:45	2018/10/23 09:00	2018/11/16 08:45	2018/12/28 06:30
246	2018/01/15 13:45	2018/02/16 08:30	2018/03/23 08:30	2018/04/09 11:30	2018/05/25 09:30	2018/06/15 08:45	2018/07/10 04:00	2018/08/31 08:45	2018/09/21 08:30	2018/10/19 08:30	2018/11/30 08:45	2018/12/07 08:45
247	2018/01/25 18:00	2018/02/10 11:45	2018/03/08 09:00	2018/04/20 14:15	2018/05/29 14:45	2018/06/30 18:00	2018/07/26 11:15	2018/08/30 14:30	2018/09/27 09:45	2018/10/10 10:30	2018/11/15 12:00	2018/12/01 18:45
248			2018/03/28 15:00	2018/04/12 07:30	2018/05/24 05:45	2018/06/28 11:00	2018/07/10 20:45	2018/08/03 06:00	2018/09/12 09:45	2018/10/11 18:15	2018/11/06 21:45	2018/12/12 18:00
249	2018/01/03 09:45	2018/02/27 09:30	2018/03/19 10:00	2018/04/03 08:45	2018/05/08 08:45	2018/06/27 08:45	2018/07/09 05:15	2018/08/20 05:15	2018/09/25 08:15	2018/10/09 09:15	2018/11/26 08:45	2018/12/10 10:00
250	2018/01/03 10:15	2018/02/07 10:00	2018/03/13 10:00	2018/04/04 10:00	2018/05/29 09:45	2018/06/12 10:00	2018/07/23 10:15	2018/08/15 10:15	2018/09/27 10:45	2018/10/30 09:45	2018/11/21 10:15	2018/12/03 10:15
251	2018/01/26 08:30	2018/02/18 10:30	2018/03/29 07:15	2018/04/17 08:15	2018/05/25 08:15	2018/06/04 08:15	2018/07/04 15:30	2018/08/30 11:00	2018/09/25 08:30	2018/10/02 08:15	2018/11/23 08:15	2018/12/12 08:15
252	2018/01/02 12:15	2018/02/13 13:00	2018/03/22 11:45	2018/04/09 14:00	2018/05/16 10:15	2018/06/19 13:15	2018/07/24 10:30	2018/08/09 15:00	2018/09/04 12:00	2018/10/26 10:30	2018/11/22 15:45	2018/12/11 12:00
253	2018/01/02 08:00	2018/02/23 08:00	2018/03/19 08:00	2018/04/06 07:45	2018/05/06 12:15	2018/06/02 11:30	2018/07/30 07:45	2018/08/04 09:00	2018/09/17 09:00	2018/10/10 09:30	2018/11/15 08:45	2018/12/27 08:15
254	2018/01/02 17:15	2018/02/03 19:45	2018/03/07 20:30	2018/04/06 20:00	2018/05/04 21:00	2018/06/07 08:15	2018/07/26 21:00	2018/08/25 20:30	2018/09/24 20:30	2018/10/27 19:30	2018/11/27 18:30	2018/12/27 17:15
255	2018/01/11 18:45	2018/02/02 17:30	2018/03/29 19:45	2018/04/20 10:45	2018/05/21 10:45	2018/06/01 09:15	2018/07/19 09:30	2018/08/14 08:00	2018/09/04 10:00	2018/10/20 12:00	2018/11/02 08:30	2018/12/22 12:00
256	2018/01/26 10:15	2018/02/23 08:45	2018/03/19 08:45	2018/04/03 08:45	2018/05/01 08:45	2018/06/19 08:15	2018/07/30 11:00	2018/08/27 15:15	2018/09/24 08:45	2018/10/26 09:15	2018/11/23 08:45	2018/12/27 09:30
257	2018/01/25 16:00	2018/02/13 14:00	2018/03/01 11:00	2018/04/18 08:30	2018/05/25 10:45	2018/06/07 07:45	2018/07/18 11:00	2018/08/17 07:00	2018/09/25 08:00	2018/10/22 07:30	2018/11/19 07:30	2018/12/03 11:45
258	2018/01/16 20:30	2018/02/03 20:45	2018/03/23 21:45	2018/04/26 16:30	2018/05/10 21:00	2018/06/18 20:45	2018/07/23 21:00	2018/08/03 21:00	2018/09/11 21:00	2018/10/11 21:15	2018/11/30 19:45	2018/12/31 22:15
259	2018/01/25 12:45	2018/02/01 10:00	2018/03/01 12:45	2018/04/24 12:45	2018/05/31 13:45	2018/06/01 11:00	2018/07/26 12:45	2018/08/07 13:00	2018/09/06 12:00	2018/10/10 10:15	2018/11/03 12:45	2018/12/22 09:15
260	2018/01/15 10:45	2018/02/06 11:30	2018/03/07 09:15	2018/04/24 13:00	2018/05/15 10:30	2018/06/01 14:15	2018/07/25 11:15	2018/08/30 11:30	2018/09/06 13:45	2018/10/03 08:45	2018/11/03 09:30	2018/12/13 11:30
261	2018/01/26 10:30	2018/02/02 09:30	2018/03/13 12:00	2018/04/26 09:15	2018/05/29 12:00	2018/06/27 15:30	2018/07/10 15:00	2018/08/02 10:00	2018/09/06 15:15	2018/10/10 10:00	2018/11/21 09:30	2018/12/11 09:15
262	2018/01/07 10:30	2018/02/17 11:00	2018/03/04 10:15	2018/04/25 18:45	2018/05/13 13:30	2018/06/30 19:15	2018/07/04 13:00	2018/08/04 18:30	2018/09/17 14:30	2018/10/10 13:00	2018/11/03 17:30	2018/12/31 17:00
263	2018/01/25 10:00	2018/02/28 09:00	2018/03/06 03:00	2018/04/24 04:30	2018/05/19 00:15	2018/06/07 04:00	2018/07/08 07:30	2018/08/25 00:30	2018/09/02 00:15	2018/10/04 10:45	2018/11/30 23:15	2018/12/31 14:00
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265	2018/01/08 19:45	2018/02/23 01:00	2018/03/01 04:15	2018/04/26 14:15	2018/05/09 03:00	2018/06/06 21:45	2018/07/18 21:45	2018/08/27 10:30	2018/09/26 14:15	2018/10/04 22:30	2018/11/20 18:45	2018/12/13 20:30
266	2018/01/13 15:00	2018/02/05 11:45	2018/03/01 15:15	2018/04/27 14:00	2018/05/29 17:30	2018/06/30 15:15	2018/07/27 15:15	2018/08/07 16:00	2018/09/15 14:30	2018/10/03 16:00	2018/11/03 14:00	2018/12/22 13:00
267	2018/01/14 06:00	2018/02/04 09:15	2018/03/18 11:30	2018/04/03 15:45	2018/05/29 22:30	2018/06/11 15:00	2018/07/07 04:30	2018/08/30 21:00	2018/09/26 13:45	2018/10/07 18:00	2018/11/30 13:00	2018/12/06 22:45
268	2018/01/13 03:30	2018/02/05 12:45	2018/03/22 22:45	2018/04/26 21:15	2018/05/29 08:15	2018/06/08 10:30	2018/07/22 00:00	2018/08/03 15:45	2018/09/17 13:45	2018/10/29 07:15	2018/11/10 03:00	2018/12/22 10:15
269	2018/01/22 08:45	2018/02/03 18:15	2018/03/20 09:45	2018/04/06 09:30	2018/05/15 14:30	2018/06/29 12:15	2018/07/05 15:15	2018/08/02 09:30	2018/09/04 10:00	2018/10/26 11:00	2018/11/29 12:45	2018/12/13 08:30
270	2018/01/13 17:45	2018/02/12 07:00	2018/03/27 13:00	2018/04/28 09:45	2018/05/31 16:00	2018/06/30 16:45	2018/07/04 13:15	2018/08/03 16:00	2018/09/16 15:15	2018/10/10 10:30	2018/11/03 15:30	2018/12/22 09:15
271	2018/01/02 12:15	2018/02/13 11:30	2018/03/20 12:30	2018/04/17 10:15	2018/05/01 18:45	2018/06/18 12:15	2018/07/24 14:30	2018/08/30 11:15	2018/09/28 10:45	2018/10/19 13:00	2018/11/29 17:30	2018/12/19 11:00
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273	2018/01/03 19:00	2018/02/03 18:45	2018/03/25 20:45	2018/04/16 18:00	2018/05/01 21:30	2018/06/05 21:45	2018/07/23 21:30	2018/08/30 20:45	2018/09/17 20:45	2018/10/14 18:45	2018/11/25 18:00	2018/12/02 18:45
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275	2018/01/16 10:00	2018/02/02 09:30	2018/03/12 21:45	2018/04/12 09:30	2018/05/19 13:00	2018/06/16 17:30	2018/07/12 09:30	2018/08/10 10:00	2018/09/15 09:30	2018/10/01 14:45	2018/11/28 14:30	2018/12/02 03:00
27												

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

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Customer I	January	February	March	April	May	June	July	August	September	October	November	December
285	2018/01/02 09:45	2018/02/13 12:15	2018/03/27 09:15	2018/04/09 11:15	2018/05/01 08:45	2018/06/04 08:45	2018/07/31 14:30	2018/08/07 12:00	2018/09/25 09:15	2018/10/19 10:15	2018/11/29 14:30	2018/12/27 10:00
286	2018/01/09 08:00	2018/02/01 08:00	2018/03/13 07:45	2018/04/17 07:45	2018/05/03 07:45	2018/06/01 14:00	2018/07/05 13:45	2018/08/29 15:30	2018/09/14 14:15	2018/10/26 08:00	2018/11/20 08:00	2018/12/20 08:00
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288	2018/01/08 09:30	2018/02/14 07:15	2018/03/19 07:15	2018/04/09 07:15	2018/05/24 07:15	2018/06/06 07:15	2018/07/04 13:00	2018/08/29 09:00	2018/09/04 15:00	2018/10/26 07:30	2018/11/15 06:45	2018/12/20 06:45
289	2018/01/12 16:30	2018/02/08 19:30	2018/03/01 18:30	2018/04/13 15:45	2018/05/31 18:30	2018/06/27 16:00	2018/07/04 16:00	2018/08/07 15:15	2018/09/14 15:30	2018/10/30 12:45	2018/11/06 19:30	2018/12/22 06:15
290	2018/01/13 12:15	2018/02/21 18:00	2018/03/29 15:15	2018/04/28 11:30	2018/05/31 17:45	2018/06/30 14:45	2018/07/05 12:00	2018/08/01 13:30	2018/09/14 15:15	2018/10/04 11:15	2018/11/03 11:45	2018/12/22 09:00
291	2018/01/19 18:45	2018/02/03 16:45	2018/03/18 15:30	2018/04/09 17:30	2018/05/23 18:30	2018/06/30 14:30	2018/07/27 14:00	2018/08/15 15:30	2018/09/16 15:45	2018/10/12 18:15	2018/11/22 11:15	2018/12/08 09:45
292	2018/01/07 08:00	2018/02/16 10:15	2018/03/07 08:15	2018/04/18 09:30	2018/05/31 07:30	2018/06/07 08:15	2018/07/20 13:00	2018/08/27 07:45	2018/09/04 09:15	2018/10/18 09:45	2018/11/20 08:00	2018/12/11 08:00
293	2018/01/31 11:30	2018/02/21 12:00	2018/03/15 15:15	2018/04/25 16:30	2018/05/17 07:30	2018/06/06 08:00	2018/07/05 08:00	2018/08/22 15:00	2018/09/28 12:15	2018/10/12 08:45	2018/11/28 07:30	2018/12/20 07:30
294	2018/01/27 21:45	2018/02/22 14:15	2018/03/27 16:00	2018/04/24 16:00	2018/05/30 16:15	2018/06/20 16:00	2018/07/04 15:30	2018/08/30 13:30	2018/09/13 14:45	2018/10/15 14:00	2018/11/03 14:00	2018/12/11 12:45
295	2018/01/07 17:45	2018/02/04 09:45	2018/03/19 07:45	2018/04/10 07:30	2018/05/04 07:30	2018/06/05 18:00	2018/07/25 18:00	2018/08/07 17:15	2018/09/25 07:30	2018/10/23 07:45	2018/11/29 22:45	2018/12/27 17:30
296	2018/01/31 01:45	2018/02/01 00:45	2018/03/24 00:30	2018/04/05 00:30	2018/05/02 01:45	2018/06/05 00:00	2018/07/27 23:30	2018/08/11 08:45	2018/09/22 20:30	2018/10/21 21:15	2018/11/10 19:45	2018/12/25 20:15
297	2018/01/02 20:15	2018/02/26 06:15	2018/03/02 05:15	2018/04/10 01:45	2018/05/02 08:15	2018/06/06 23:15	2018/07/06 23:00	2018/08/21 20:45	2018/09/13 22:15	2018/10/23 03:15	2018/11/13 12:00	2018/12/06 00:45
298	2018/01/07 17:45	2018/02/03 09:30	2018/03/25 17:45	2018/04/02 15:30	2018/05/20 09:15	2018/06/23 18:30	2018/07/22 12:15	2018/08/05 12:15	2018/09/29 17:45	2018/10/14 17:30	2018/11/22 12:15	2018/12/28 17:30
299	2018/01/04 17:45	2018/02/15 08:00	2018/03/17 18:30	2018/04/27 23:00	2018/05/21 11:30	2018/06/10 20:15	2018/07/04 22:15	2018/08/30 20:00	2018/09/25 22:00	2018/10/25 21:45	2018/11/06 19:30	2018/12/01 16:00
300	2018/01/17 14:15	2018/02/14 22:30	2018/03/14 11:45	2018/04/09 22:45	2018/05/12 15:30	2018/06/26 11:15	2018/07/04 21:30	2018/08/15 19:45	2018/09/25 09:30	2018/10/13 18:15	2018/11/29 17:00	2018/12/13 17:30
301	2018/01/02 08:00	2018/02/14 15:30	2018/03/20 09:45	2018/04/30 08:45	2018/05/17 08:30	2018/06/28 08:15	2018/07/18 11:45	2018/08/08 11:30	2018/09/12 14:15	2018/10/03 08:30	2018/11/14 09:00	2018/12/20 08:00
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303	2018/01/19 20:45	2018/02/27 15:15	2018/03/02 16:30	2018/04/29 18:45	2018/05/04 13:00	2018/06/02 12:15	2018/07/02 10:15	2018/08/03 20:15	2018/09/04 23:00	2018/10/12 19:00	2018/11/14 20:15	2018/12/02 17:00
304	2018/01/27 19:45	2018/02/19 00:00	2018/03/11 09:45	2018/04/17 17:45	2018/05/15 10:15	2018/06/27 22:30	2018/07/02 22:45	2018/08/20 08:00	2018/09/09 15:00	2018/10/31 09:15	2018/11/24 10:15	2018/12/01 10:15
305	2018/01/04 10:15	2018/02/02 10:00	2018/03/28 09:45	2018/04/21 12:15	2018/05/10 13:15	2018/06/04 10:30	2018/07/04 13:15	2018/08/13 13:30	2018/09/13 14:45	2018/10/22 13:15	2018/11/26 09:00	2018/12/17 13:15
306	2018/01/22 22:15	2018/02/13 22:15	2018/03/22 11:15	2018/04/03 08:00	2018/05/01 06:15	2018/06/03 12:30	2018/07/23 14:30	2018/08/17 13:15	2018/09/28 22:15	2018/10/01 14:15	2018/11/29 08:30	2018/12/19 14:30
307	2018/01/04 08:30	2018/02/05 10:15	2018/03/10 08:15	2018/04/06 08:30	2018/05/10 08:15	2018/06/25 08:15	2018/07/25 12:30	2018/08/25 14:30	2018/09/13 08:15	2018/10/19 08:30	2018/11/23 08:45	2018/12/14 08:45
308	2018/01/31 21:00	2018/02/03 17:15	2018/03/03 10:45	2018/04/20 11:15	2018/05/03 19:45	2018/06/05 16:00	2018/07/05 15:45	2018/08/07 15:45	2018/09/25 05:45	2018/10/20 20:00	2018/11/29 15:00	2018/12/27 12:30
309	2018/01/07 14:30	2018/02/01 02:45	2018/03/04 22:30	2018/04/02 23:15	2018/05/16 14:45	2018/06/03 22:15	2018/07/22 22:15	2018/08/30 12:00	2018/09/14 16:00	2018/10/18 04:15	2018/11/23 10:00	2018/12/27 12:15
310	2018/01/07 17:30	2018/02/03 10:30	2018/03/26 09:15	2018/04/16 06:00	2018/05/18 09:15	2018/06/07 11:45	2018/07/24 10:30	2018/08/30 10:30	2018/09/04 13:15	2018/10/15 11:30	2018/11/23 08:00	2018/12/12 10:15
311	2018/01/27 06:15	2018/02/01 06:15	2018/03/17 06:15	2018/04/08 06:15	2018/05/10 06:15	2018/06/12 06:15	2018/07/05 19:45	2018/08/08 16:00	2018/09/06 16:00	2018/10/27 06:15	2018/11/24 06:15	2018/12/31 06:15
312	2018/01/04 12:00	2018/02/23 07:00	2018/03/14 09:30	2018/04/23 05:15	2018/05/01 01:30	2018/06/14 10:15	2018/07/05 13:30	2018/08/11 11:45	2018/09/24 09:45	2018/10/25 13:15	2018/11/14 10:00	2018/12/11 09:30
313	2018/01/12 16:00	2018/02/16 16:30	2018/03/27 11:00	2018/04/14 12:30	2018/05/11 11:15	2018/06/30 17:45	2018/07/23 15:45	2018/08/30 15:45	2018/09/04 13:15	2018/10/02 17:00	2018/11/27 12:15	2018/12/21 17:45
314	2018/01/26 22:00	2018/02/03 22:15	2018/03/18 07:15	2018/04/02 22:15	2018/05/29 22:30	2018/06/29 18:15	2018/07/28 22:30	2018/08/28 22:30	2018/09/04 10:45	2018/10/18 22:15	2018/11/29 14:30	2018/12/28 05:15
315	2018/01/06 22:15	2018/02/03 06:30	2018/03/13 07:15	2018/04/10 05:15	2018/05/03 05:15	2018/06/19 05:15	2018/07/23 05:15	2018/08/29 05:15	2018/09/13 05:15	2018/10/26 06:45	2018/11/23 05:15	2018/12/31 07:15
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317	2018/01/07 11:00	2018/02/03 06:30	2018/03/08 10:45	2018/04/13 10:45	2018/05/23 22:45	2018/06/05 23:00	2018/07/30 16:45	2018/08/03 10:45	2018/09/17 22:00	2018/10/02 10:45	2018/11/29 12:45	2018/12/20 08:00
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320	2018/01/27 14:15	2018/02/03 11:00	2018/03/14 15:15	2018/04/10 05:45	2018/05/12 09:15	2018/06/30 11:15	2018/07/05 10:30	2018/08/25 08:00	2018/09/27 02:30	2018/10/26 16:30	2018/11/29 12:45	2018/12/13 11:00
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322	2018/01/13 10:15	2018/02/02 10:15	2018/03/29 12:00	2018/04/25 16:15	2018/05/31 16:45	2018/06/30 16:45	2018/07/04 15:00	2018/08/04 15:00	2018/09/06 16:30	2018/10/10 10:30	2018/11/03 15:30	2018/12/22 15:30
323	2018/01/13 17:00	2018/02/21 18:00	2018/03/02 18:15	2018/04/28 15:00	2018/05/29 12:00	2018/06/30 17:00	2018/07/25 13:00	2018/08/07 16:30	2018/09/06 13:00	2018/10/20 13:30	2018/11/03 10:30	2018/12/22 11:00
324								2018/08/10 12:15	2018/09/07 12:15	2018/10/26 23:00	2018/11/22 19:00	2018/12/09 07:15
325	2018/01/11 14:30	2018/02/13 12:00	2018/03/08 09:30	2018/04/03 09:30	2018/05/31 14:30	2018/06/29 13:15	2018/07/18 09:00	2018/08/02 15:15	2018/09/06 12:30	2018/10/29 22:45	2018/11/28 12:30	2018/12/07 18:30
326	2018/01/18 00:45	2018/02/14 20:15	2018/03/28 00:45	2018/04/11 21:00	2018/05/10 01:30	2018/06/06 22:30	2018/07/19 09:15	2018/08/22 00:45	2018/09/13 12:30	2018/10/31 19:00	2018/11/08 23:15	2018/12/05 00:00
328	2018/01/07 12:45	2018/02/18 20:15	2018/03/09 16:00	2018/04/01 06:15	2018/05/08 18:45	2018/06/08 17:30	2018/07/07 11:00	2018/08/24 14:30	2018/09/27 19:00	2018/10/17 18:15	2018/11/13 23:00	2018/12/22 12:15
329	2018/01/08 22:30	2018/02/23 04:15	2018/03/13 00:15	2018/04/17 13:00	2018/05/03 22:00	2018/06/15 02:00	2018/07/23 09:30	2018/08/24 15:30	2018/09/17 12:00	2018/10/25 14:45	2018/11/14 17:30	2018/12/18 15:15
330											2018/11/15 11:00	2018/12/19 10:30
331	2018/01/07 06:30	2018/02/22 22:15	2018/03/17 21:45	2018/04/14 23:30	2018/05/21 09:30	2018/06/05 09:15	2018/07/14 20:45	2018/08/29 09:00	2018/09/20 22:00	2018/10/23 09:30	2018/11/16 13:30	2018/12/29 00:45

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1 **Request IR-19:**

2
3 **Reference page 21, lines 6 through 21, of Mr. Levitan's Evidence. Does Mr. Levitan believe**
4 **that it should cost E1 the same in a \$/kWh basis to achieve the same level of savings in 2019**
5 **as in 2020? Please explain your answer.**

6
7 Response IR-19:

8
9 **From Richard Levitan, Levitan & Associates, Inc.:**

10
11 It will be more difficult and therefore more costly to achieve additional energy savings and peak
12 demand reductions once the most cost-effective measures have been adopted. However,
13 historical actual investment and energy savings from 2015 to 2018 indicate that it should cost E1
14 approximately the same in a \$/kWh basis to achieve the same level of savings in 2019 as in
15 2020. As shown in Figure 1 on page 8 of my evidence, the unitized cost of energy savings was
16 \$0.23/kWh, \$0.22/kWh, \$0.22/kWh and \$0.23/kWh in 2015, 2016, 2017 and 2018, respectively.

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1 **Request IR-20:**

2
3 **Please explain how “participation levels are reduced due to lower energy savings” and not**
4 **vice versa (Appendix A, page 23, line 13)**

5
6 Response IR-20:

7
8 **From Richard Levitan, Levitan & Associates, Inc.:**

9
10 The cited excerpt is a direct citation from E1’s Application, Appendix A, page 45 of 95, lines 4-
11 6: “The significant difference between the Alternate scenario and EfficiencyOne’s Preferred Plan
12 is that participation levels are reduced due to lower energy savings and investment levels.”
13 Based on this statement it appears, EfficiencyOne’s approach in formulating its Alternate
14 scenario was to reduce the investment levels as a first step, and then calculate the lower energy
15 savings and participation levels.

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Request IR-21:

Mr. Levitan says that “the Canadian experience is just as relevant [as US experience], perhaps more so given similar temperature patterns, winter peak season demand patterns, cultural / aesthetic considerations, and affordability measures” (Appendix A, page 27).

(a) Please provide any information Mr. Levitan reviewed in determining that Canadian utilities have temperature patterns and winter peak season demand patterns more similar to Nova Scotia than do such high-ranking US states as Vermont, Rhode Island, Massachusetts, Connecticut, Michigan, Washington, Illinois, and Minnesota.

(b) Please describe in detail the “cultural / aesthetic considerations” that make the feasibility and value of load reductions to Nova Scotia more like those in other provinces than in the high-ranking US states.

Response IR-21:

From Richard Levitan, Levitan & Associates, Inc.:

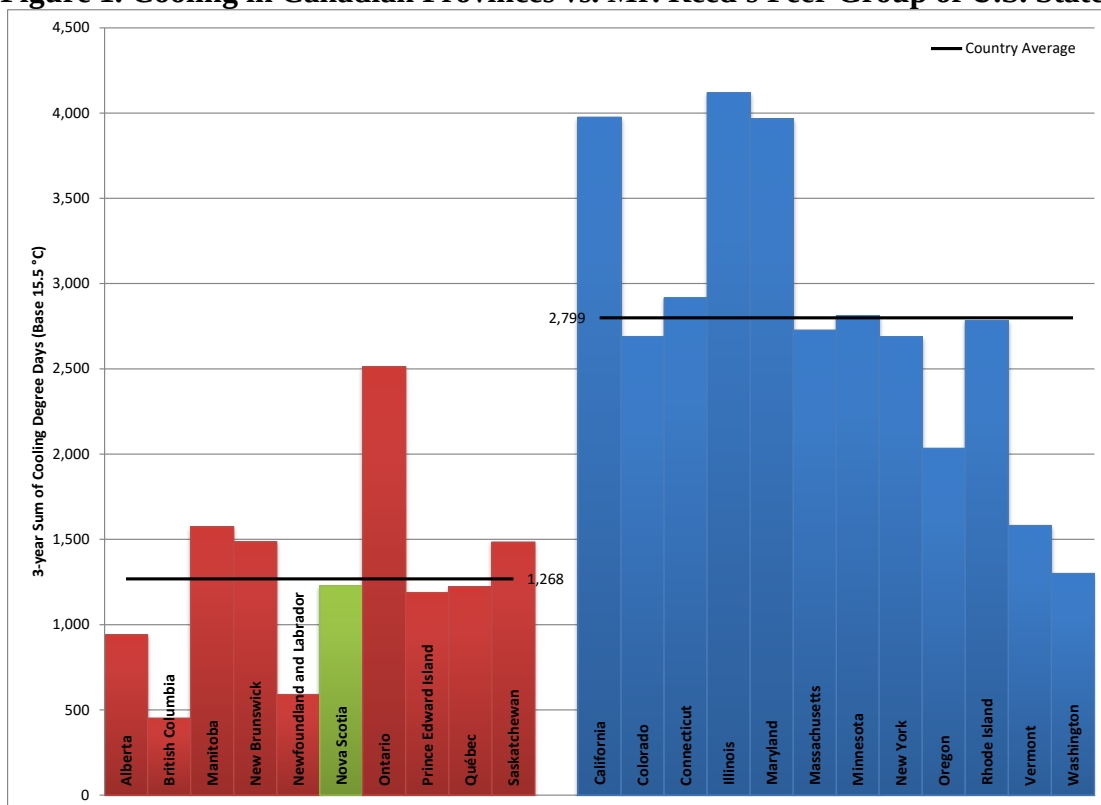
(a) In order to determine that Canadian utilities have temperature patterns more similar to Nova Scotia than do such high cost U.S. states as Vermont, Rhode Island, Massachusetts, Connecticut, Michigan Washington, Illinois and Minnesota, I compared heating and cooling degree days between all provinces and the twelve states in Mr. Reed’s benchmarking peer group found in Table 1 (page 6 of 16) of Appendix E of EfficiencyOne’s Evidence. Other than Michigan, all of the states mentioned here are included in Mr. Reed’s benchmarking peer group. Please refer to CA IR-21(a) for the results of my analysis. I used degree day data from www.degreedays.net to conduct my analysis. For each state or province, I selected a high quality (three stars) weather station near the state or provincial capital. I then downloaded monthly heating and cooling degree day data with a base temperature of 15.5 °C for the last 36 months. I then

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calculated the sum of heating and cooling degree days over the past 36 months for comparison purposes.

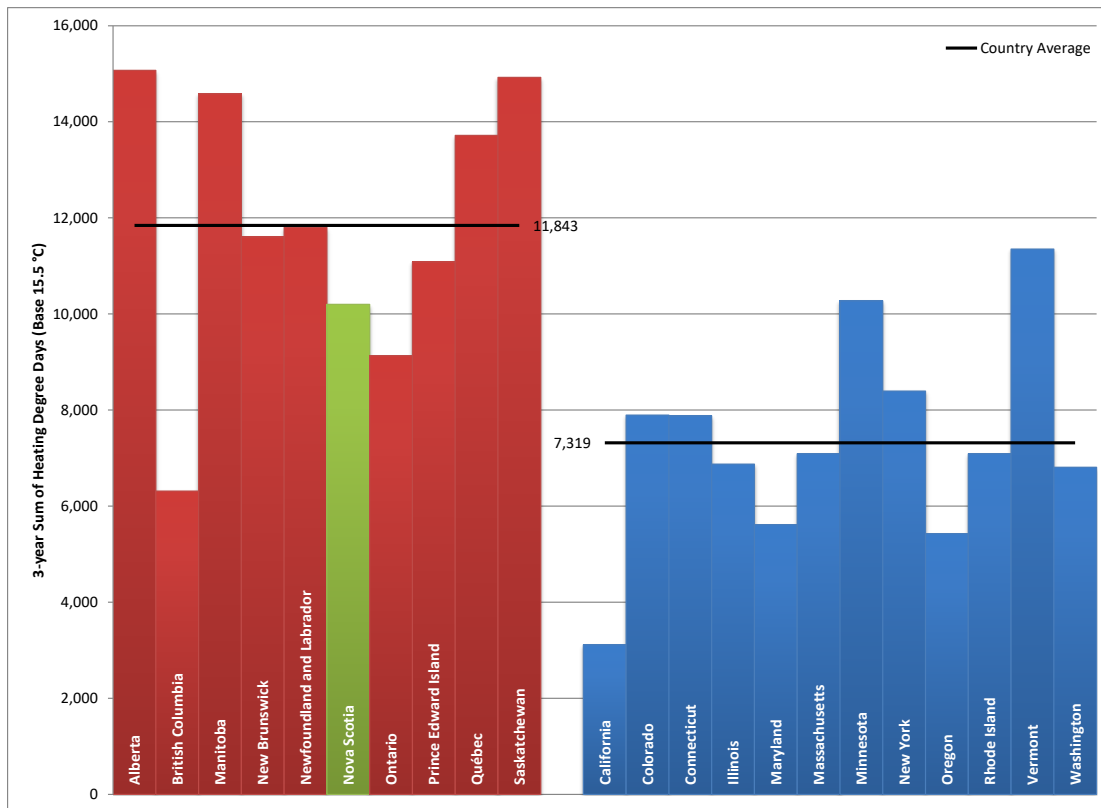
Figure 1 below summarizes the comparison of cooling degree days and Figure 2 below summarizes the comparison of heating degree days. My analysis concludes that the provinces are much more similar to Nova Scotia in cooling degree days and more similar to Nova Scotia in heating degree days than the twelve states in Mr. Reed's peer group. Nova Scotia had 10,202 heating degree days over this period, which is closer to the provincial average of 11,843 than the state peer group average of 7,319. The differences in cooling degree days are notable. Nova Scotia had 1,227 cooling degree days over this period, which is far closer to the provincial average of 1,268 than the state peer group average of 2,799. The state peer group average is over twice that of the provincial average, highlighting the differences in temperature patterns between the Canadian provinces and Mr. Reed's benchmarking peer group.

Figure 1. Cooling in Canadian Provinces vs. Mr. Reed's Peer Group of U.S. States



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Figure 2. Heating in Canadian Provinces vs. Mr. Reed's Peer Group of U.S. States



I do not have the information necessary to conduct a comparison of winter peak season demand patterns in Canadian provinces and Mr. Reed's benchmarking peer group.

- (b) The cultural and aesthetic considerations which affect energy policy in Nova Scotia and elsewhere in Canada are different than in the U.S. Recognition of Nova Scotia's aboriginal population is an integral part of energy infrastructure development. For example, EfficiencyOne has designed Home Energy Efficiency for First Nations people which was first introduced in 2018 as a pilot. Appliance replacements are now part of EfficiencyOne's plan for First Nations. Likewise, it has been my experience that appropriate safeguards designed to protect the interests of the Inuit and Dene in the Northwest Territories, Nunavut and Yukon reflect energy infrastructure, health and educational program initiatives. These cultural and aesthetic attributes are typical across Canada, including the Maritimes, Quebec and Ontario. In contrast, native American interests in the U.S. are not nearly as prominently featured in energy policy and

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1 infrastructure decisions, with the exception of siting new transmission lines across native
2 American reservations in the desert southwest and geothermal development in Hawaii.
3 These factors may make the feasibility and value of load reductions in Nova Scotia more
4 like those elsewhere in Canada than in the high-ranking states that are summer peaking,
5 not winter peaking. Air conditioning drives the summer peak; hence, a reliable
6 generation system geared around summer peak day reliability is generally distinguishable
7 from the Canadian experience.

REDACTED (CONFIDENTIAL INFORMATION REMOVED)

Description: Celsius-based heating degree days for a base temperature of 15.5C
Source: www.degreedays.net (using temperature data from www.wunderground.com)

Station ID	Canada									
	CYEG	CWLM	CYWG	CYFC	CYYT	CYHZ	CYYZ	CYYG	CYOY	CYQR
Province/State	Alberta AB	British Columbia BC	Manitoba MB	New Brunswick NB	Ontario ON	Prince Edward Island PE	Quebec QC	Saskatchewan SK		
Country Average	11,843	11,843	11,843	11,843	11,843	11,843	11,843	11,843	11,843	11,843
Province/State 3-year Sum	15,070	6,314	14,582	11,604	11,802	10,202	9,130	11,082	13,716	14,924
3-year Monthly Average	419	175	405	322	328	283	254	308	381	415
3-year Monthly St. Dev.	304	117	352	262	196	223	233	241	309	339
May 2016	167	87	98	150	274	173	96	193	164	128
June 2016	63	59	33	56	168	82	14	82	57	40
July 2016	39	36	14	18	76	14	1	16	22	21
August 2016	64	25	20	17	41	5	0	10	19	44
September 2016	180	73	78	82	132	59	13	58	113	130
October 2016	438	151	280	219	235	172	136	178	284	357
November 2016	459	183	371	352	287	324	262	322	407	419
December 2016	877	383	871	663	562	561	524	577	741	889
January 2017	777	375	870	655	584	563	527	612	750	870
February 2017	664	320	700	612	540	527	439	572	672	680
March 2017	668	275	634	606	558	579	494	596	708	617
April 2017	388	190	318	302	425	312	199	343	359	320
May 2017	142	126	135	155	374	188	124	199	167	135
June 2017	66	63	38	54	141	60	16	61	52	60
July 2017	50	38	15	20	49	14	0	10	24	17
August 2017	77	30	36	35	51	12	7	15	48	36
September 2017	175	55	91	53	98	39	32	49	80	126
October 2017	364	153	274	152	225	121	106	129	201	338
November 2017	722	248	652	420	369	340	344	367	530	690
December 2017	761	348	917	719	497	557	627	612	853	830
January 2018	812	290	924	731	548	604	644	666	890	866
February 2018	832	305	886	558	526	462	477	532	665	927
March 2018	699	264	646	508	493	482	482	519	551	713
April 2018	470	188	446	355	391	342	362	374	457	486
May 2018	109	96	102	143	313	162	49	205	169	89
June 2018	75	71	19	82	246	104	11	116	76	37
July 2018	57	26	14	9	38	6	0	7	13	32
August 2018	94	32	29	14	30	4	0	4	19	51
September 2018	304	71	168	91	133	59	26	74	108	222
October 2018	404	157	390	294	263	226	216	256	361	412
November 2018	570	216	687	483	406	398	413	438	560	642
December 2018	725	288	803	663	564	590	476	623	798	746
January 2019	726	284	1,012	763	571	616	682	683	940	906
February 2019	1,041	380	974	673	614	600	546	665	775	1,061
March 2019	665	257	702	559	555	519	508	548	684	668
April 2019	346	171	335	338	425	326	277	371	399	319

United States											
KSMF	KBBF	KBDL	KSPI	KBWI	KBOS	KMSP	KALB	KSLE	KPVD	KMPV	KOLM
California CA	Colorado CO	Connecticut CT	Illinois IL	Maryland MD	Massachusetts MA	Minnesota MN	New York NY	Oregon OR	Rhode Island RI	Vermont VT	Washington WA
7,319	7,319	7,319	7,319	7,319	7,319	7,319	7,319	7,319	7,319	7,319	7,319
3,115	7,897	7,881	6,875	5,616	7,092	10,274	8,396	5,429	7,092	11,351	6,811
87	219	219	191	156	197	285	233	151	197	315	189
84	184	203	198	160	185	279	217	124	186	259	130
23	150	85	44	56	90	64	86	62	83	143	91
6	10	10	2	2	6	3	16	32	7	57	62
4	2	1	0	0	0	1	1	10	0	16	27
6	14	2	0	0	0	1	2	10	0	15	34
16	42	27	6	3	10	17	29	47	14	73	79
41	112	144	61	69	108	147	153	94	112	232	135
126	265	281	199	202	234	272	309	155	232	389	195
270	526	475	495	372	423	674	502	392	427	619	414
238	520	468	447	361	424	668	492	413	428	604	424
125	316	394	259	256	370	447	404	271	372	520	317
96	234	453	264	291	446	448	484	202	426	627	267
66	218	152	78	63	176	172	151	167	154	254	201
29	140	86	43	45	108	77	89	89	84	159	116
9	21	22	4	6	16	5	20	31	17	53	56
1	1	3	0	0	1	0	2	12	1	20	38
1	10	8	5	0	0	3	9	7	2	43	27
11	62	24	24	8	9	22	33	33	12	66	62
60	213	79	97	64	44	170	86	132	54	138	199
104	264	326	263	232	270	427	339	208	264	470	264
252	462	553	493	416	509	698	589	356	494	732	397
189	435	583	561	476	535	742	620	250	524	723	294
186	468	379	396	287	340	674	418	273	322	507	320
150	304	391	332	346	400	469	438	249	374	545	300
76	226	271	231	165	256	371	305	152	242	393	195
34	84	42	3	8	58	23	35	60	44	88	89
10	14	16	1	4	16	1	13	34	16	61	66
1	4	2	0	0	0	0	1	8	1	16	30
5	8	1	1	0	0	2	0	9	0	13	30
15	42	23	17	1	5	41	23	47	13	70	82
47	239	166	155	100	126	249	178	109	146	282	183
147	382	355	406	277	287	524	378	214	306	490	258
210	483	458	436	342	388	581	467	289	408	643	340
187	488	580	590	449	495	785	623	300	514	779	338
200	492	457	456	345	410	724	498	332	430	628	406
130	432	394	374	293	362	535	421	252	393	567	304
44	214	170	132	77	170	237	182	128	176	316	171

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Request IR-22:

“Even though the methodology is not identical to ACEEE’s, the data table appendix to the Consortium for Energy Efficiency’s 2017 State of the Efficiency Program Industry report contains information on historical DSM spending in provinces broken down into subcategories for that year. Canadian DSM plans are also readily available and should have been reviewed by Mr. Reed.” (Appendix A, page 24)

(a) Please provide the “readily available Canadian DSM plans.”

(b) Please provide the historical DSM energy savings for each province for which Mr. Levitan or NS Power has such information.

(c) Please identify the Canadian provinces that would be been in the top ten jurisdictions for energy savings, if they had been included in the ACEEE survey.

Response IR-22:

From Richard Levitan, Levitan & Associates, Inc.:

(a) Links to several Canadian DSM plans are provided below. I have listed the most recent version of each report. This is not a comprehensive list. I did not study the provinces’ DSM spending in the context of the ACEEE top ten jurisdictions for energy savings. Instead, I focused on evidence put forth by EfficiencyOne. Had I been responsible for performing benchmark analysis, I would have included Canada in the benchmarking exercise.

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BC Hydro Fiscal 2020 to Fiscal 2021 Revenue Requirements Application

<https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/regulatory-filings/rra/bch-f20f21-rra.pdf>

Fortis BC 2019-2022 DSM Expenditures Application

https://fbcdotcomprod.blob.core.windows.net/libraries/docs/default-source/about-us-documents/regulatory-affairs-documents/electric-utility/180802_fbc_2019-2022_dsm_expenditures_application_ff.pdf

Hydro-Québec 2019 Interventions en Efficacité Énergétique

http://publicsde.regie-energie.qc.ca/projets/469/DocPrj/R-4057-2018-B-0026-Demande-Piece-2018_07_27.pdf

Manitoba Hydro-Electric Board 67th Annual Report For the Year Ended March 31, 2018

https://www.hydro.mb.ca/corporate/ar/pdf/annual_report_2017_18.pdf

New Brunswick Power DSM Plan 2018/19-2020/21: Energy Efficiency and Demand Response Initiatives

<https://filemaker.nbeub.ca/fmi/webd/NBEUB%20ToolKit13>.

The Matter# is 0375 and the document is NBP1.50 Appendix AA.i.

Newfoundland Power Five-Year Conservation Plan: 2016 to 2020

<http://www.pub.nf.ca/applications/NP2016GRA/files/application/NP-2016-2017GeneralRateApplication-Volume2-2015-10-16.pdf>

- (b) I reviewed several Canadian DSM plans in order to identify recent trends in DSM spending. I did not review the levels of historical energy savings. Therefore, I do not have information on the historical DSM energy savings by province.

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- 1 (c) I do not have the required energy savings data for each province.

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1 **Request IR-23:**

2
3 **Please provide the data underlying Appendix A, Figures 6–8.**

4
5 Response IR-23:

6
7 **From Richard Levitan, Levitan & Associates, Inc.:**

8
9 Please refer to the response to Synapse IR-27(b).

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1 **Request IR-24:**

2
3 **Please provide a version of Appendix A, Figure 8, showing each of the three years of the**
4 **proposed E1 Plan for 2020 through 2022, and actual DSM spending changes for 2014**
5 **through 2019.**

6
7 Response IR-24:

8
9 **From Richard Levitan, Levitan & Associates, Inc.:**

10
11 The histograms in Figures 6-8 contain data on the percent changes in total electric efficiency
12 spending by state for 2013 through 2017. It is not possible to provide the requested version of
13 Figure 8 with actual DSM spending changes for 2014 through 2019. ACEEE releases its state
14 scorecards toward the end of the year. Each year's scorecard contains spending data for the
15 previous year. For example, the 2018 scorecard was released in October of 2018 and contained
16 spending data for 2017. Assuming the same reporting protocol, the data required to respond to
17 this request will not be available until October 2020. Please refer to Synapse IR-27 (b).

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1 **Request IR-25:**

2
3 **Mr. Levitan says “At a time when almost one-half the states are decreasing their spending,**
4 **EfficiencyOne is proposing a substantial increase.” (Appendix A, page 36). How do Figures**
5 **6–8, which show the distribution of annual increases for 2014 to 2017, indicate that is**
6 **happening at this time?**

7
8 Response IR-25:

9
10 **From Richard Levitan, Levitan & Associates, Inc.:**

11
12 As discussed in CA IR-24, more recent data are not available. Therefore, the data I used are the
13 best available to describe current trends in DSM spending. As discussed in my evidence at page
14 38 of 103, 88 of the 196 observations (44.9 percent) reflect a decrease in spending from the
15 previous year. I have therefore reported that the data in Figures 6-8 show that almost one-half
16 of the states are decreasing their spending at the current time.

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Request IR-26:

Reference Mr. Levitan's comparison of ES1's Plan to New Brunswick on page 37 of his Evidence.

(a) What is the per capita spend for New Brunswick compared to ES1?

(b) What is the spending as a percentage of revenue for New Brunswick compared to ES1?

(c) What is the projected levelized cost of first year energy savings (\$/kWh) for New Brunswick compared to ES1?

Response IR-26:

From Richard Levitan, Levitan & Associates, Inc.:

(a) I have used 2016 Canadian census data, which reports New Brunswick's population as 747,101. Nova Scotia's population is 923,598.¹ It is important to note that NB Power uses fiscal years for its DSM plans. EfficiencyOne uses calendar years. I will therefore compare NB Power's proposed spending of \$31.6 million in 2020/21² to EfficiencyOne's proposed spending of \$43.3million in 2021.³ This results in a per capita spend of \$46.88 in Nova Scotia and \$42.30 in New Brunswick. Based on the information from NS Power NB Power is proposing a lower per capita spend than EfficiencyOne. NB Power's DSM initiatives also include LED streetlights which increase their per capita spend relative to

¹ Data from the 2016 Canadian Census can be retrieved here: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>.

² Page 7 of 46 "DSM Plan 2018/19-2020/21: Energy Efficiency and Demand Response Initiatives," New Brunswick Power. This document can be accessed at <https://filemaker.nbeub.ca/fmi/webd/NBEUB%20Toolkit13>. The Matter# is 0375 and the document is NBP1.50 Appendix AA.i.

³ EfficiencyOne's Evidence, page 6 of 62, Table 1.

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- 1 NS Power's per capita spend which does not include the Company's investment in LED
2 streetlights.
3
4 (b-c) I do not have this information.

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1 **Request IR-27:**

2
3 **Reference page 38, lines 1 through 7, of Mr. Levitan's Evidence.**

4
5 **(a) Does Mr. Levitan believe that E1's Preferred Scenario is not cost-effective? Why or**
6 **why not.**

7
8 **(b) Is Mr. Levitan advocating for the usage of the Rate Impact Measure (RIM) for**
9 **evaluating E1's DSM plan?**

10
11 Response IR-27:

12
13 **From Richard Levitan, Levitan & Associates, Inc.:**

14
15 (a) According to EfficiencyOne, its Preferred Plan has a TRC test value of at least 1.9.¹
16 Therefore, according to the total resource cost test, it is cost effective. I note that the
17 referenced section of my testimony refers to changes in state spending on EE, not cost-
18 effectiveness. I am not sure whether or not the CA believes that changes in spending are
19 linked to whether a DSM plan is cost-effective. This is not the case. EfficiencyOne's
20 Preferred Plan proposes to increase spending and is cost-effective according to the TRC
21 test. In previous years, the Board has approved plans developed by EfficiencyOne that
22 had lower spending levels and were still cost-effective according to the TRC test.

23
24 (b) No, I have not recommended such a change.

¹ Ibid.

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1 **Request IR-28:**

2
3 **Please provide any information available to NS Power or Mr. Levitan regarding the data in**
4 **Appendix A, Figure 9, including:**

5
6 **(a) the identity of the 84 program administrators,**

7
8 **(b) whether any of the administrators are transferring some DSM responsibilities to**
9 **other parties, as in California,**

10
11 **(c) whether any of the administrators face legislative limitations on energy-efficiency**
12 **spending,**

13
14 **(d) absolute spending levels,**

15
16 **(e) the computation of a net “slight decline” (page 39)**

17
18 **Response IR-28:**

19
20 **From Richard Levitan, Levitan & Associates, Inc.:**

21
22 **(a-e) Please refer to Synapse IR-28(b). I did not create Figure 9 and do not have the requested**
23 **information. The reference to a “slight decline” is found on page 35 (or 38 of 103) of**
24 **my testimony. This is a direct reference to the E Source article.**

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1 **Request IR-29:**

2
3 **With regard to the statement that “the additional EE spend may have hit or be close to**
4 **hitting the point of diminishing returns in regard to energy savings or peak demand**
5 **reductions.” (Appendix A, page 41):**

6
7 **(a) Please explain whether “diminishing returns” means “negative returns” or simply**
8 **“less spectacular concerns than previously.”**

9
10 **(b) If Mr. Levitan’s observation is anything more than speculation, please provide all**
11 **the evidence that he relied on in reaching his conclusion.**

12
13 **Response IR-29:**

14
15 **From Richard Levitan, Levitan & Associates, Inc.:**

16
17 **(a) The term “diminishing returns” is used to refer to a point at which the level of profits or**
18 **benefits gained is less than the amount of money invested.**

19
20 **(b) My observation is based on my review of the evidence in these proceedings. I have also**
21 **drawn from my industry experience. Diminishing returns start to occur when penetration**
22 **of measures is hampered by saturation, as discussed in response to CA IR-15. Please**
23 **refer to pages 23-24 of 103 of my evidence where I discuss the higher cost of the first-**
24 **year energy savings. The results of my calculations show that the first-year unitized cost**
25 **is \$0.46/kWh for the Preferred Plan. This high cost does not compare favorably with the**
26 **lower first year energy saving cost of \$0.26/kWh in 2019. That is what I mean when I**
27 **say “diminishing returns.”**

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1 **Request IR-30:**

2
3 **With regard to Mr. Levitan’s preference for “postponing implementation of energy**
4 **efficiency measures that are costly now to a time when these measures are more cost-**
5 **effective” (Appendix A, page 45), please clarify whether Mr. Levitan proposes postponing:**
6

7 **(a) The upgrading of efficiency in new construction, renovation and rehabilitation of**
8 **buildings.**

9
10 **(b) The improvement of efficiency of appliances and equipment being replaced.**
11

12 **(c) Increased efficiency in new industrial processes.**
13

14 **(d) The last few inches of insulation being blown into an attic.**
15

16 **Response IR-30:**
17

18 **From Richard Levitan, Levitan & Associates, Inc.:**
19

20 (a-d) In making my recommendation to postpone implementation of costly energy efficiency
21 measures, I did not analyze the costs and benefits of individual EE measures. I do not
22 know which of the specified measures are more costly than others or are more likely to
23 become much less expensive in the next few years. I recommend that the Board should
24 order scrutinizing the proposed DSM Plan on a measure-by-measure basis and then
25 identifying those measures that are more costly than others. The underlying measures
26 associated with the less costly DSM scenario I have recommended should be compared to
27 the cost and performance metrics in EfficiencyOne’s Preferred Plan and Alternate
28 Scenario.

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Request IR-31:

Please provide the computation of “the 10-year average of \$44.28/MWh from the 2011-2020 period” (Appendix A page 45).

(a) Please explain whether the \$44.28/MWh is an average cost of something or a marginal cost.

(b) If NS Power is aware of the source of the \$106.93/MWh used by E1, please identify it.

(c) If NS Power has computed a different avoided cost, please provide it, with the supporting workpapers.

(d) If the 2014 IRP avoided costs are seriously out of date, why has NS Power not prepared a new draft IRP yet?

(e) Please describe the status of the preparation of NS Power’s next IRP, including the shareholder consultations that have occurred to date.

Response IR-31:

From NS Power:

(a) Please refer to Synapse IR-15. The \$44.28 is a 10-year average of the marginal cost from 2011 to 2020.

(b) NS Power is aware from Section 10.5 of E1’s Application and discussions with E1 that E1 used the 2014 IRP Avoided costs. \$106.93 is the average avoided cost E1 used in its

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1 RBIA for the period between 2015 and 2030. It is derived from the 2014 IRP avoided
2 costs.

3
4 (c) NS Power has not calculated a different avoided cost for the purpose of E1's Application.
5 The Company's evidence is that over the past number of years the actual avoided costs
6 have been significantly lower than the values from the 2014 IRP.

7
8 (d) Please refer to Synapse IR-3. The Company's next scheduled IRP is in 2020.

9
10 (e) The Company is in the initial stages of IRP preparation and will have a stakeholder
11 engagement plan similar to previous IRPs.

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1 **Request IR-32:**

2
3 **Please explain how “The average marginal fuel cost for the 23-year period from 2011 to**
4 **2033 [of] \$74/MWh” is related to the “\$106.93/MWh used by E1 in years 2015-2030.”**
5 **(Appendix A page 45)**

6
7 **(a) Please provide the source of the \$74/MWh.**

8
9 **(b) Please explain why Mr. Levitan think it is useful to include years back to 2011 in**
10 **any discussion of avoided costs developed in 2014 and being used to screen**
11 **programs with savings in 2020 and beyond.**

12
13 **Response IR-32:**

14
15 **From Richard Levitan, Levitan & Associates:**

16
17 **(a) Please refer to NS Power’s response to Synapse IR-16.**

18
19 **(b) It is useful to include the historic period in order to highlight the gulf between the**
20 **assumed avoided energy costs used by EfficiencyOne for derivation of customer benefits**
21 **and the actual marginal cost. As discussed in my evidence, the levelized avoided fuel**
22 **cost used to compute customer benefits gives a misleading account of who pays what and**
23 **when. While the avoided costs developed in 2014 may be of limited relevance to screen**
24 **program savings in 2020 and beyond, what is relevant in terms of affordability and**
25 **ratepayer protection is the acknowledgement that the marginal cost of fuel is 33 percent**
26 **of the current avoided energy cost used in the RBIA analysis and about 50 percent of the**
27 **current valued used from 2015 through 2024.**

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Request IR-33:

Please identify the “comparatively inexpensive energy available in the province from existing and new clean hydro generation resources through 2022.” (Appendix A Page 46)

(a) Please explain why this statement focuses on the hydro and not the fossil generation in the province.

(b) Please explain the significance of 2022 for the purposes of the passage quoted above, given that measures installed in 2020–2022 will produce savings into the 2030s and in many cases, well beyond.

Response IR-33:

From Richard Levitan, Levitan & Associates, Inc.:

Comparatively inexpensive energy available in Nova Scotia is generated by hydro generation resources. The existing hydro resources are specified in Appendix A of NS Power’s Evidence. New hydro resources include Muskrat Falls through Maritime Link.

(a) The statement is not focused on fossil generation because any opportunistic available energy is expected to come from Muskrat Falls. Please refer to NSUARB IR-1.

(b) The year 2022 is important not from the long-term savings, which are uncertain, but from certain short-term costs and affordability perspective. As I understand it, the Board has to review the potential for long term savings, which because of the extended study horizon are inherently uncertain, with the certainty of short- term costs. 2022 is the last year of the 3-year DSM Resource Plan so it is central to considerations about affordability.

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Request IR-34

With regard to the statement that “New technologies may evolve that would make the currently proposed EE measures obsolete.” (Appendix A Page 48 of 103)

(a) Please define “obsolete” in this context.

(b) Please explain whether Mr. Levitan is referring to a situation in which an EE measure is implemented in 2020 and then in 2025 a new technology becomes commercially available such that:

(i) E1 would wish the new technology had been available in 2020,

(ii) Nova Scotia would have been better off if the 2020 measure had not been implemented and the 2025 version was implemented instead,

(iii) E1 would want to tear out the 2020 installation and implement the 2025 technology, or

(iv) Something else.

(c) Please identify the technologies that Mr. Levitan has identified as evolving so quickly that EE measures implemented today have a significant likelihood of becoming obsolete (by his definition) before a 2020 installation would have paid back its investment, by way of avoided costs.

(i) Please provide the basis for Mr. Levitan’s opinion that those technologies may create obsolescence.

(d) Please explain how, if at all, Mr. Levitan’s concern with obsolescence is relevant to transitory opportunities, such as in new construction, renovation, replacement of failing equipment, or other opportunities that may arise in 2020 and (if not realized then) may not be available again for many years.

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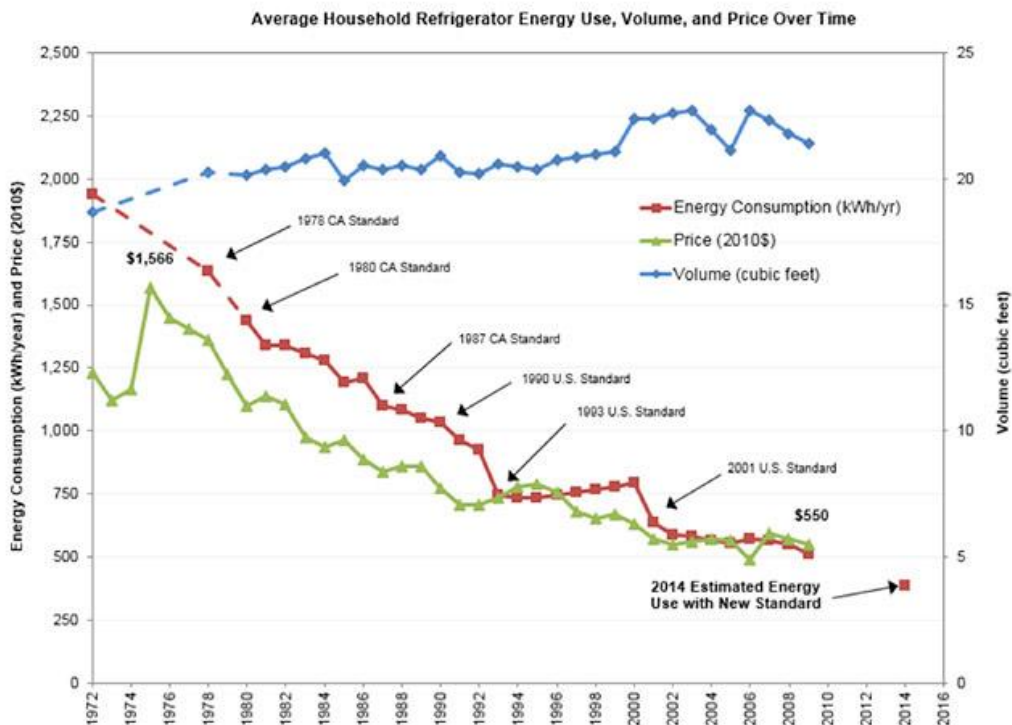
Response IR-34:

From Richard Levitan, Levitan & Associates, Inc.:

(a) In this context “obsolete” means something is no longer the best solution because a better, more cost-effective solution is available.

(b) I refer to a situation in which an EE measure is implemented in 2020 while already in 2020 a new, comparable, and more efficient technology becomes commercially available. As technology evolves quickly, the prospect of technology progress yielding cost savings in the years ahead appears likely. Moreover, the uncertainty surrounding projected long-term benefits raises additional concern about the quality of the benefits in relation to the certainty of cost incurrence.

Figure 1. Average Household Refrigerator Energy Use, Volume, and Price



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1 For example, Figure 1 above illustrates the changes in the refrigeration technology over
2 the 40 years from the early 70s.¹ The technology improvement continues at a high pace,
3 and consumers are not likely to purchase obsolete models if more efficient options are
4 available for the same price. Other electric appliances have also become more efficient
5 with the passage of time. I do not understand what actions EfficiencyOne might take if it
6 were to realize that an approved DSM program is no longer attractive for the potential
7 customers.

8
9 (c) I have not analyzed the EE measures and technologies from the perspective of how
10 quickly any of them has or would evolve. However, the example I presented in part (b)
11 regarding refrigerators suggests that some appliance technologies can evolve quickly.

12
13 (d) My concern with obsolescence does not relate to new construction, or urgent repairs or
14 replacements. However, the concern is relevant to renovations or upgrades that can be
15 postponed.

¹ <https://aceee.org/blog/2014/09/how-your-refrigerator-has-kept-its-co>

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Request IR-35:

Mr. Levitan points out that average per-capita income is lower in Nova Scotia than in some US states with leading EE programs. (Appendix A Pages 36 and 49 of 103)

(a) Does Mr. Levitan believe that reducing energy bills is important for households with lower incomes, as well as those with higher income?

(b) Please provide any comparison by NS Power or Mr. Levitan of the cost of living in Nova Scotia and in the states with leading EE programs, by such measures as:

(i) Median household price

(ii) Cost of medical care

(iii) Cost of education

Response IR-35:

From Richard Levitan, Levitan & Associates, Inc.:

(a) Yes, I believe that reducing energy bills is generally important for all households. Savings for lower income households is progressive, not regressive and should be encouraged.

(b) NS Power has not compared the cost between Nova Scotia and Mr. Reed's chosen group of DSM program administrators.

NON-CONFIDENTIAL

1 **Request IR-36:**

2
3 **Please reconcile Mr. Levitan’s statements that (1) customers in Nova Scotia benefit from**
4 **DSM measures oriented toward reduction in peak demand (Appendix A Page 49), (2) peak**
5 **demand reduction programs are “potentially meritorious” (Appendix A Page 50), and (3)**
6 **the Preferred Plan’s first-year percentage increase in targeted capacity savings of 84%**
7 **“are steep and therefore concerning” (Appendix A Page 48).**

8
9 Response IR-36:

10
11 **From Richard Levitan, Levitan & Associates, Inc.:**

12
13 I support EfficiencyOne’s plan to reduce peak demand in Nova Scotia through DSM measures,
14 but not at any price. As noted in my evidence on page 52, EfficiencyOne appears to believe that
15 cost effectiveness and affordability are the same. The TRC test indicates cost-effectiveness, not
16 affordability. Cost effectiveness does not take into account what share of the customer’s income
17 the initial expenditure represents. The steep 84 percent first-year increase in capacity savings
18 mentioned on page 48 causes concerns: the estimates are unconfirmed and based on the
19 incomplete 2019 DSM pilot programs. My interest in ratepayer safeguards makes me think the
20 projected capacity savings may be too good to be true.

NON-CONFIDENTIAL

1 **Request IR-37:**

2
3 **Please define “bankability of the benefits” as Mr. Levitan uses that term at p. 50 of**
4 **Appendix A.**

5
6 **(a) Please provide the metrics by which the Board should determine the bankability of**
7 **a claimed benefit.**

8
9 **(b) Please rate the bankability of each of the benefits that E1 claims for the EE**
10 **programs, and provide the workpapers supporting those ratings.**

11
12 **(c) Please rate the bankability of each of the benefits that NS Power Maritime Link**
13 **claimed for the Maritime Link, and provide the workpapers supporting those**
14 **ratings.**

15
16 **(d) Please rate the bankability of each of the benefits that NS Power Maritime Link**
17 **claimed for the AMI capital expenditure, and provide the workpapers supporting**
18 **those ratings.**

19
20 **Response IR-37:**

21
22 **From Richard Levitan, Levitan & Associates, Inc.:**

23
24 **(a) The Board should characterize a claimed benefit as bankable if such benefit is guaranteed**
25 **even after uncertainties are accounted for, or in the judgment of the Board, such claimed**
26 **benefits are highly likely to materialize.**

27
28 **(b-d) These analyses have not been undertaken as part of my evidence.**

NON-CONFIDENTIAL

1 **Request IR-38:**

2
3 **“These percentages represent rate impacts of \$97.4 million...for residential...customers...,**
4 **from 2020 to 2035.” (Appendix A Pages 50 and 51 of 103).**

5
6 **(a) Please provide the computations to the values presented in millions of dollars.**

7
8 **(b) Please explain how Mr. Levitan took into account the reduction in energy**
9 **consumption in his computations.**

10
11 **Response IR-38:**

12
13 **From Richard Levitan, Levitan & Associates, Inc.:**

14
15 **(a) Please refer to Attachment 1.**

16
17 **(b) The energy consumption values used in the computation are after the impact of DSM**
18 **programs.**

Supply rate difference between with and without EE cases (¢/kWh)

Year	Residential	Small general	General	Large general	Small industrial	Medium industrial	Large industrial	Municipal utility
2020	0.468	0.568	0.554	0.633	0.740	0.258	0.314	0.314
2021	0.521	0.646	0.614	0.686	0.792	0.277	0.351	0.351
2022	0.461	0.625	0.608	0.683	0.782	0.250	0.330	0.330
2023	0.043	0.050	0.031	0.024	0.027	0.017	0.026	0.026
2024	0.057	0.067	0.041	0.032	0.036	0.022	0.034	0.034
2025	0.073	0.088	0.053	0.042	0.046	0.028	0.044	0.044
2026	0.084	0.103	0.061	0.048	0.053	0.032	0.051	0.051
2027	0.087	0.109	0.064	0.050	0.055	0.032	0.052	0.052
2028	0.080	0.104	0.060	0.047	0.051	0.030	0.048	0.048
2029	0.085	0.113	0.064	0.050	0.054	0.031	0.051	0.051
2030	0.079	0.109	0.060	0.046	0.050	0.028	0.048	0.048
2031	0.065	0.093	0.050	0.038	0.041	0.023	0.039	0.039
2032	0.040	0.059	0.031	0.024	0.025	0.014	0.024	0.024
2033	0.070	0.106	0.055	0.041	0.043	0.024	0.042	0.042
2034	-0.004	-0.007	-0.003	-0.003	-0.003	-0.001	-0.003	-0.003
2035	-0.025	-0.041	-0.020	-0.015	-0.016	-0.008	-0.015	-0.015

Annual sales with EE (GWh)

Year	Residential	Small general	General	Large general	Small industrial	Medium industrial	Large industrial	Municipal utility
2020	4,462	218	2,372	389	253	596	664	164
2021	4,451	214	2,333	386	254	615	662	163
2022	4,456	210	2,306	384	255	645	659	163
2023	4,466	206	2,280	381	256	676	657	164
2024	4,501	202	2,256	378	257	699	655	165
2025	4,495	199	2,228	376	258	714	653	165
2026	4,496	195	2,216	373	259	728	651	165
2027	4,488	190	2,186	370	259	740	648	165
2028	4,502	185	2,165	367	260	751	645	166
2029	4,470	179	2,124	364	260	761	642	165
2030	4,458	173	2,086	360	260	772	639	165
2031	4,447	167	2,049	356	260	783	636	165
2032	4,439	161	2,013	353	260	795	633	164
2033	4,432	155	1,978	349	260	807	630	164
2034	4,428	150	1,945	346	260	819	627	164
2035	4,427	145	1,914	343	260	832	625	165

Rate Impact (\$)

Year	Residential	Small general	General	Large general	Small industrial	Medium industrial	Large industrial	Municipal utility
2020	20,862,445	1,238,724	13,144,728	2,463,902	1,870,958	1,538,156	2,088,008	515,713
2021	23,211,853	1,383,154	14,331,576	2,648,282	2,012,494	1,700,959	2,320,434	571,346
2022	20,520,983	1,313,245	14,022,351	2,624,347	1,994,686	1,609,873	2,172,205	537,283
2023	1,920,566	102,485	696,041	92,187	69,974	115,441	167,830	41,894
2024	2,548,207	135,938	921,412	121,989	92,935	154,489	222,538	56,059
2025	3,265,535	174,350	1,177,126	156,214	119,208	199,031	284,894	71,987
2026	3,775,925	201,461	1,359,797	180,143	138,056	231,132	329,221	83,443
2027	3,887,533	207,636	1,395,323	185,143	142,045	239,087	338,346	86,153
2028	3,597,720	192,160	1,288,240	171,021	131,856	221,937	312,557	80,441
2029	3,795,055	202,717	1,352,876	180,235	139,104	234,811	329,268	84,625
2030	3,533,195	189,041	1,254,086	167,193	129,558	219,389	306,125	79,046
2031	2,892,476	154,911	1,022,389	136,371	106,095	180,191	250,279	64,931
2032	1,778,263	95,193	625,736	83,729	65,210	111,207	153,614	39,799
2033	3,080,988	164,616	1,079,389	144,474	112,952	193,383	265,762	69,183
2034	-193,118	-10,347	-67,372	-9,041	-7,074	-12,158	-16,629	-4,350
2035	-1,104,289	-59,187	-383,665	-51,598	-40,405	-69,788	-95,070	-25,098
Total	97,373,337	5,686,097	53,220,034	9,294,592	7,077,651	6,867,140	9,429,383	2,352,454

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Request IR-39:

Mr. Levitan says that “results of the 2019 DSM pilots are not yet available, so it is difficult to make the leap of faith that the claimed benefits are real, bankable, and of sufficient quality to outweigh adverse customer impacts.” (Appendix A Page 51)

(a) When Mr. Levitan refers to “the claimed benefits,” does he mean (1) energy and demand savings, (2) the avoided-cost benefits per unit of energy and demand savings, or some of both?

(b) If Mr. Levitan is referring to future avoided-cost benefits per unit of energy and demand savings being uncertain, does he expect that the results of the 2019 DSM pilots will resolve those uncertainties?

(c) For each DSM pilot, please describe the claimed benefits that Mr. Levitan believes may not be real, in what way they may be unreal, and his basis for that belief.

(d) For each DSM pilot, please describe the claimed benefits that Mr. Levitan believes may not be bankable, in what way they may be non-bankable, and his basis for that belief.

(e) For each DSM pilot, please describe the claimed benefits that Mr. Levitan believes may not be of sufficient quality, in what way they may be of poor quality, and his basis for that belief.

(f) For each program associated with a 2019 DSM pilot, please explain whether the energy and capacity savings claimed by E1 are significantly different than those that are reported by other utilities and program administrators, and if so, in what way they are different.

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1 Response IR-39:
2

3 **From Richard Levitan, Levitan & Associates, Inc.:**
4

5 (a) These claimed benefits refer to peak demand reduction and avoided capacity costs.
6

7 (b) The results of the 2019 pilots will provide the basis for future estimates. The results of
8 the pilot programs will not resolve all uncertainties but should help resolve many
9 uncertainties of relevance in gauging the economics and operational impacts of specific
10 DR measures.
11

12 (c-f) Until the results of the 2019 DSM pilots become available, the individual characterization
13 of prescriptive and custom programs is premature. The claimed aggregate peak demand
14 reduction in 2020-2022, which seems to be based on a simplified linear extrapolation of
15 the 2019 estimates, should be estimated after the results of the 2019 DSM pilots are
16 verified. Verification of the results of the 2019 DSM pilot programs may be in disaccord
17 with the use of a simple linear extrapolation to estimate the peak demand reduction.

NON-CONFIDENTIAL

Request IR-40:

“NS Power’s ability and cost to avoid capacity remains uncertain in the next five to ten years, perhaps longer in response to NS Power’s seasonal peak demand, the need for operating reserves as a safeguard for intermittent generation,...” (Appendix A Page 51)

(a) Please explain whether “capacity” in this quote refers to generation capacity alone, or to T&D capacity as well. If the latter, please explain how operating reserves affect the avoidability of T&D.

(b) Does Mr. Levitan believe that EE that reduces “NS Power’s seasonal peak demand” will not allow it to mothball or retire existing generation, or avoid adding new generation? If so, please explain why.

(c) Please provide NS Power’s operating-reserve requirements rules and the actual operating-reserve requirements for each hour of 2018.

(d) Please explain how NS Power’s operating-reserve requirements preclude the avoidance of capacity costs.

Response IR-40:

From Richard Levitan, Levitan & Associates, Inc.:

(a) In the quote, the term “capacity” refers to generation capacity.

(b) Please refer to NS Power’s response to NSUARB IR-22, CA IR-2, and CA IR-5.

(c) On a day-ahead planning basis, for all hours, NS Power requires operating reserve margins of the following contexts:

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- Minimum of 75 MW of 30-Minute Reserve.
- Minimum of 157 to 171 MW of 10-Minute Reserve (based on the net rating of the largest online generator).
- Minimum of 33 MW of Synchronized Reserve (included in the 10-Minute Reserve).

On an intra-day basis, for all hours, NS Power requires reserve margins of:

- Thirty-Minute Reserve for NS Power is 50 MW as per the Interconnection Agreement between NS Power and NB Power.
- Minimum of 157 to 171 MW of 10-Minute Reserve (based on largest online generator net rating).
- Minimum of 33 MW of Synchronized Reserve (included in the 10-Minute Reserve).

Actual operating reserve requirements for each hour of 2018 are provided in Attachment 1.

- (d) The statement in my evidence was not that operating reserve requirements preclude avoided capacity costs, but rather they contribute to the uncertainty around them.

2020-2022 DSM CA IR-40 Attachment 1 has been filed electronically.

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Request IR-41:

“NS Power’s ability and cost to avoid capacity remains uncertain in the next five to ten years, perhaps longer in response to...structural changes in the market. Such structural change pertains to increased electrification for transport.” (Appendix A Page 51)

(a) Please provide NS Power’s current forecast of the effect of “increased electrification for transport” on its energy requirements and peak load, assuming no new utility or governmental incentives for transportation electrification.

(b) Please provide any reports or analyses of the effect of “increased electrification for transport” on NS Power’s energy requirements and peak load, with the programs that NS Power would prefer be implemented.

(c) Please provide any reports or analyses of the maximum potential effect of “increased electrification for transport” on NS Power’s energy requirements and peak load.

(d) If E1 implements less EE and transportation is rapidly electrified, would Mr. Levitan expect the need for new generation capacity to be accelerated in the absence of EE?

(i) If the need for new generation capacity is accelerated, would avoided costs be higher with electrification for transport?

(e) Does Mr. Levitan expect that a portion of electric vehicle load would be subject to NS Power dispatch or curtailment?

(i) If so, would electric vehicles provide operating reserves?

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Response IR-41:

From NS Power:

- (a) Please refer to pages 29 and 30 of the 2019 Load Forecast Report¹ for details on how the current forecast was developed. This forecast does assume some peak-mitigation (for example rate-based) within the peak assumption of 0.6kW per vehicle. This forecast notes that 1.0kW per vehicle assumes no programs or incentives, which is reflected in the table below.

Year	New Electric Vehicles	Load (GWh)	Peak @ 1.0kW per vehicle
2019	195	1	0
2020	567	2	1
2021	1272	4	1
2022	2539	8	3
2023	4743	15	5
2024	8464	26	8
2025	14540	45	15
2026	21919	69	22
2027	29298	94	29
2028	36677	118	37
2029	45531	147	46

- (b) As noted in the 2019 Load Forecast, NS Power is currently looking to obtain data sets that will help in validating peak impacts of residential EV charging. In the interim, NS Power has assumed 1.3kW in a high scenario. See below for the forecast of load and peak for a “high” scenario which would be the result of increased charging infrastructure in Nova Scotia, vehicle availability, increased education and awareness, as well as rebates and incentives towards the purchase of an electric vehicle.

¹ NS Power 2019 Load Forecast Report, April 30, 2019 (M09191)

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Year	New Electric Vehicles	Load (GWh)	Peak @ 1.3kW per vehicle
2019	400	2.296	1
2020	1600	4.592	2
2021	2800	8.6408	4
2022	5300	16.3558	7
2023	10300	31.7858	13
2024	17800	58.7756	23
2025	26800	88.4936	35
2026	36800	121.514	48
2027	47800	168.16	62
2028	62800	220.93	82
2029	77800	273.7	101

(c) NS Power has not developed any forecasts outside of the two mentioned in (a) and (b).

From Richard Levitan, Levitan & Associates, Inc.:

(d) No. EV charging happens during the off-peak. Nova Scotia has plenty of surplus energy during the off-peak to support electrification goals regardless of prospective EE program additions.

(i) N/A

(e) Elsewhere, a portion of electric vehicle load can be subject to utility dispatch, including curtailment if operating conditions warrant. Depending how charging stations are configured and spatially distributed, utilities have explored the realization of operating reserves from electric vehicle load.

NON-CONFIDENTIAL

1 **Request IR-42:**

2
3 **Please explain what Mr. Levitan means by “consumer preference is an evolving dynamic.”**
4 **(Appendix A Page 51)**

5
6 Response IR-42:

7
8 **From Richard Levitan, Levitan & Associates, Inc.:**

9
10 Consumer preference changes over time. Consumers change their minds based on economic,
11 environmental and related public policy program initiatives.

NON-CONFIDENTIAL

Request IR-43:

When Mr. Levitan refers to “the long-term benefits are uncertain because they are based on the unconfirmed results of the 2019 peak demand reduction pilots” (Appendix A Page 52), does “long-term benefits” refer to the (1) energy and demand savings, (2) the avoided-cost benefits per unit of energy and demand savings, or some of both?

(a) Please provide Mr. Levitan or NS Power’s estimate of the extent to which the savings per installation would need to be incorrect to make each program non-cost-effective.

Response IR-43:

From Richard Levitan, Levitan & Associates, Inc.:

When I state that “the long-term benefits are uncertain because they are based on the unconfirmed results of the 2019 peak demand reduction pilots” (Appendix A, Page 52), I mean the long-term benefits that are based on the capacity savings. The peak demand reducing measures do not affect energy consumption and have little or no energy savings. Capacity savings are determined based strictly on the change in the coincident kW needed to maintain reliable grid operations. The benefits are estimated in dollars when the capacity savings are multiplied by the avoided capacity unit cost.

From NS Power:

(a) Neither Mr. Levitan nor NS Power performed the suggested sensitivity analysis for the purpose of this proceeding. The reference cited was made to note that the programs upon which the estimates were made have not been subject to the DSM Evaluation and Verification processes and are therefore uncertain.

NON-CONFIDENTIAL

Request IR-44:

Please explain why Mr. Levitan believes that “Whether participation is scalable to investment is unknown.” (Appendix A Page 52)

(a) For each program, please provide Mr. Levitan’s estimate of the portion of the program cost that represents incentives to customers.

(b) If participation is lower, does Mr. Levitan expect that incentives paid would be proportionately lower? If not, why not.

Response IR-44:

From Richard Levitan, Levitan & Associates, Inc.:

Whether participation is scalable to investment is unknown because the evidence presented by EfficiencyOne is unclear.

(a) I did not prepare this analysis for the purposes of my evidence.

(b) I did not consider for the purposes of my evidence whether or not incentives paid would be proportionately lower if participation is lower. Under certain circumstances the relationship may not be proportional.

NON-CONFIDENTIAL

1 **Request IR-45:**

2
3 **Mr. Levitan states that “the projected savings are based on the assumption that all the**
4 **residential participants in the peak demand reduction programs would be served under the**
5 **time-of-use (TOU) tariff, which is not certain.” (Appendix A Page 52)**
6

7 **(a) Please explain why a customer would install storage heating or off-peak water**
8 **heating if the customer did not anticipate being on a TOU rate or receiving some**
9 **other bill reduction from the equipment.**
10

11 **(b) Would Mr. Levitan’s concern be ameliorated if the incentives for residential**
12 **customers to participate in the demand reduction programs were contingent on**
13 **their switching to the TOU rate?**
14

15 **(c) Has NS Power developed draft rate proposals to more effectively encourage**
16 **customers with loads that can be shifted to do so, using the AMI equipment**
17 **currently being installed? If so, please describe those proposals.**
18

19 **Response IR-45:**
20

21 **From Richard Levitan, Levitan & Associates, Inc.:**
22

23 (a) I am not in a position to guess the reasoning behind a consumer decision. I believe that
24 there might be other strategies or usage patterns that may come into conflict with the
25 intent of TOU. For example, the households will be using dishwashers, washers and
26 dryers, electric stoves, and other conventional appliances during on-peak hours that
27 would defeat the purpose of the TOU. Participants may continue to evaluate the value
28 associated with TOU versus the loss of convenience associated with rescheduled certain
29 domestic activities to the off-peak period. Rather than adjust energy use patterns, some

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1 customers may switch back to basic service where price is not differentiated by time-of-
2 day.

3
4 (b) Yes, to some extent.

5
6 **From NS Power**

7
8 (c) NS Power is committed to developing time varying pricing tariffs by June 30, 2020,
9 which is in accordance with the Board's Order in the AMI Project capital approval
10 (M08349).

NON-CONFIDENTIAL

1 **Request IR-46:**

2
3 **Mr. Levitan expresses a concern that “certain technologies that are relevant based on**
4 **current planning and cost parameters can become less relevant or irrelevant with the**
5 **passage of time.” (Appendix A Page 53)**
6

7 **(a) Does Mr. Levitan mean that certain baseline technologies that are a significant**
8 **portion of current baseline conditions will be less common in the future, or that the**
9 **technologies for which E1 is planning to offer incentives (to replace today’s baseline**
10 **equipment) will no longer be appropriate for incentives in the future, or something**
11 **else?**
12

13 **(b) Please explain the reference to “planning and cost parameters” and list example of**
14 **the parameters that Mr. Levitan refers to here.**
15

16 **(c) Please identify the technologies that E1 is using as part of its current baseline**
17 **estimates that Mr. Levitan believes will become irrelevant, or less relevant than E1**
18 **assumes in its program screening, by 2022.**
19

20 **(d) Please identify the technologies that E1 is proposing to encourage in 2020–2022 that**
21 **Mr. Levitan believes will become irrelevant, or less relevant than E1 assumes in its**
22 **program screening, by 2022.**
23

24 **Response IR-46:**
25

26 **From Richard Levitan, Levitan & Associates, Inc.:**
27

28 **(a)** It could be both. Today’s baseline technologies used as a benchmark to estimate savings
29 can be less common, and the new technologies incentivised today may become much less
30 relevant or obsolete.

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1
2 (b) Reference to “planning and cost parameters” is related to the DSM programs proposed by
3 EfficiencyOne. Planning parameters include expected penetration and timing, while cost
4 parameters include equipment installation costs, incentives, cost of enabling strategies,
5 etc.

6
7 (c-d) I did not screen the DSM Plan and the baseline technologies on a measure-by-measure
8 basis to specify the technologies that will become irrelevant. I note that technology
9 disruption like UBER is observed in many industries, not just iPhones, flat panel TVs,
10 streaming media, and health care. For example, the cost of renewable resources has
11 plummeted in recent years. Many Northeast states have authorized state jurisdictional
12 utilities to enter into long term contracts for green energy resources at a steep discount to
13 like contracts that were formed several years ago, thereby saving ratepayers billions of
14 dollars. Energy technology that looked innovative just five years ago is now obsolete.
15 Regarding DSM, time will tell what technologies will become obsolete.

NON-CONFIDENTIAL

1 **Request IR-47:**

2
3 **In the same sentence, Mr. Levitan says that “demand reduction cost per watt may be**
4 **lower” for a DSM program focused on peak demand reduction, and that “peak demand**
5 **reducing technologies are more expensive than passive EE.” (Appendix A Page 55) Mr.**
6 **Levitan also attributed the decline from “\$1.69/W for the Board approved 2019 DSM Plan**
7 **[to] \$1.07/W for the 2020-2022 Preferred Plan” (ibid at 54) to the fact that “EfficiencyOne**
8 **shifted the focus from the traditional EE to the peak demand reduction measures.” (ibid at**
9 **55.**

10
11 **(a) Please explain whether Mr. Levitan is asserting that “peak demand reducing**
12 **technologies are more expensive than passive EE” or that they are more expensive**
13 **than passive EE.**

14
15 **Response IR-47:**

16
17 **From Richard Levitan, Levitan & Associates, Inc.:**

18
19 **I am asserting that peak demand reducing technologies are more expensive than passive EE but**
20 **produce more benefits.**

NON-CONFIDENTIAL

1 **Request IR-48:**

2
3 **Please provide the basis for the assertion that “peak demand reduction cost...is expected to**
4 **remain constant or change slightly with changes in the DSM budget.” (Appendix A Page**
5 **55)**

6
7 **(a) Please provide all analyses Mr. Levitan or NS Power have conducted of the unit cost**
8 **of peak demand reduction across a range of DSM budgets.**

9
10 Response IR-48:

11
12 **From Richard Levitan, Levitan & Associates, Inc.:**

13
14 As shown in Table 1¹, from 2012 to 2019, the largest variation in demand savings cost change
15 relative to the previous year was -12 percent from 2015 to 2016. This variation can be attributed
16 to a correction EfficiencyOne has incorporated in the 2016-2018 Plan. EfficiencyOne may have
17 underestimated the natural penetration of DSM. NS Power informed the Board about ENS’s
18 investment overestimation:

19
20 In its initial evidence for the 2013-2015 DSM Plan Evidence, E1 proposed an
21 increase in installed DSM costs. Actual results to-date show that E1 actually
22 achieved significantly lower costs than proposed. The approved price for 2014
23 was \$0.35/kWh, with actuals being \$0.26/kWh, a 28 percent reduction from
24 projected unit cost, and \$0.25/kWh after accounting for ITC effects.²

25
26 The second largest variation in demand savings cost change relative to the previous year
27 was -5 percent from 2012 to 2013.

¹ Table 1 data were derived from the E1 2016-2018 DSM Plan, E1 2020-2022 DSM Preferred Plan, and ENS 2016 Annual Progress Report (including Appendices A-D),

² 2016-2018 DSM Plan, NS Power Evidence, April 10, 2015, page 21 of 51.

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1

Table 1. Unit Cost of Peak Demand Reduction 2012-2022

Year	Investment (\$ million)	Demand Savings Cost (\$/W)	Demand Savings Cost Change Relative to Previous Year
2012	43.7	1.88	
2013	46.2	1.78	-5%
2014	48.7	1.80	1%
2015	39.0	1.84	2%
2016	33.2	1.63	-12%
2017	34.0	1.62	0%
2018	34.9	1.66	3%
2019	34.1	1.69	2%
2020	41.9	1.08	-36%
2021	43.3	1.07	-1%
2022	43.9	1.07	-1%

2

NON-CONFIDENTIAL

1 **Request IR-49:**

2
3 **Mr. Levitan asserts that “it appears that EfficiencyOne formulated an optimistic projection**
4 **of the peak demand reductions assuming scalability from the 2019 pilot results to the**
5 **aggressive peak demand reduction targets for the 2020-2022 period.” (Appendix A Page**
6 **59)**

7
8 **(a) Does Mr. Levitan mean to imply that E1 selected the peak demand reduction targets**
9 **and then forces its projections to fit those targets?**

10 **(i) If so, please provide the basis for the assertion that E1 worked backwards**
11 **from its desired conclusion to its formulation of peak demand reductions.**

12 **(ii) If Mr. Levitan meant something else, please explain what this sentence**
13 **means.**

14
15 **(b) Please provide all evidence to support the assertion that E1 did whatever Mr.**
16 **Levitan is asserting in this passage.**

17
18 **Response IR-49:**

19
20 **From Richard Levitan, Levitan & Associates, Inc.:**

21
22 (a-b) “Projection” of the peak demand reductions and peak demand reduction “targets” are
23 synonymous in the context of the citation. EfficiencyOne could have developed
24 “projection” and then set up the “target,” or vice versa. It makes no difference in what
25 sequence EfficiencyOne arrived at its peak demand reduction targets. What matters is
26 that the peak demand reduction programs proposed by EfficiencyOne are a linear
27 extrapolation of the yet to be achieved 2019 DSM pilot results. As I understand it the
28 2019 pilot results have not yet been verified or validated.

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Request IR-50:

Please explain why Mr. Levitan finds “it odd that substantially similar investments in residential programs under the Board-approved 2019 DSM Plan and the Alternate scenario result in much different peak demand reductions but similar energy savings” (Appendix A Page 59), given that he acknowledges that “demand reduction cost per watt may be lower” for a DSM program focused on peak demand reduction and that the shift “from the traditional EE to the peak demand reduction measures” explains the reduction in cost per W of peak reduction.

(a) If the cost per W of peak reduction declines, does it not follow that the peak reduction for a given budget will increase?

Response IR-50:

From Richard Levitan, Levitan & Associates, Inc.:

This is odd because similar investments in residential programs under the 2019 DSM Plan and the Alternate scenario could result in either similar peak demand reductions and energy savings or different peak demand reductions and energy savings depending on the focus of the programs. The shift in focus from energy savings to peak demand reduction should result in higher peak demand reduction and lower energy savings.

(a) If the cost per W of peak demand reduction declines, peak demand reduction for a given budget increases, but energy savings decrease.

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1 **Request IR-51:**

2
3 **Please explain how “The lifetime benefits in the LES metric are themselves based on the**
4 **measure’s avoided costs.” (Appendix A Page 61).**

5
6 **(a) In what units does Mr. Levitan believe LES is measured?**

7
8 Response IR-51:

9
10 **From Richard Levitan, Levitan & Associates, Inc.:**

11
12 The lifetime benefits are expressed in dollars and are based on the lifetime energy savings and
13 the avoided costs.

14
15 (a) I believe LES is measured in MWh.

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1 **Request IR-52:**

2
3 **Mr. Levitan states that introduction of constraints into the ProCESS model “has the**
4 **potential for bias favorable to EfficiencyOne’s interests. When the modeler does not like a**
5 **result, other constraints and data can be added that would lead closer to the desired**
6 **outcome. This behind-the-curtain capability defeats much of the purpose of using**
7 **modelling as a planning tool.” (Appendix A Page 65).**

8
9 **(a) Please describe “EfficiencyOne’s interests” and “the desired outcome” as Mr.**
10 **Levitan understands those in this passage.**

11
12 **(b) Please provide the basis for Mr. Levitan’s beliefs regarding “EfficiencyOne’s**
13 **interests” and “desired outcome.”**

14
15 **(c) Can Mr. Levitan specify particular constraints that E1 might have added that**
16 **would “lead closer to the desired outcome”?**

17
18 **(d) In Mr. Levitan’s opinion, if E1 conducted a preliminary run with ProCESS and**
19 **found an implausible result (e.g., participation in a particular program ramped up**
20 **more quickly than E1 expected to be able to deploy trained contractors), should E1**
21 **have added a constraint to prevent that unrealistic result? If not, what action should**
22 **E1 have taken?**

23
24 **(e) Can Mr. Levitan identify any of the “various possible superior model solutions for**
25 **final solution polishing may have been missed because of the inadequacies of the**
26 **constraints that were added”?**

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1 Response IR-52:

2
3 **From Richard Levitan, Levitan & Associates, Inc.:**

4
5 (a) E1 presumably has the conventional private business interest in growing its business, and
6 a “desired outcome” is one that pursues that goal.

7
8 (b) The basis is the neoclassical economic theory of firm behavior, in effect, a textbook
9 explanation of what motivates firms and individuals. The core assumptions of
10 conventional neoclassical economics are: people have rational preferences among various
11 outcomes; firms maximize growth; and, people act independently as agents on the basis
12 of full or perfect information.

13
14 (c) It is difficult to infer that any particular constraints added to the model result in outcomes
15 closer to those desired. In part, this is because a particular constraint, such as one that
16 governs how rapidly a program will ramp up or down may in part reflect the efficient
17 allocation of resources (costs) that serve a range of interests. The identification issue is
18 not binary – that it either advances a growth motive or some other motive. Also, growth
19 motive is correlated with -- rather than opposed to -- social welfare advancement
20 objectives. Hence, the pursuit of growth maximization typically provides socio-
21 economic value to consumers, but due to imperfect competition, lack of needed
22 regulation, or other factors, may not maximize social welfare. My thinking behind the
23 referenced passage has to do with more subtle biases, which may result from asymmetric
24 information between seller and buyer, including Board access to information.

25
26 (d) Yes. My issue is not with additional constraints, per se, being added, but with whether
27 the process by which they are added is transparent to all stakeholders, allowing for
28 challenges of model development where there are different views based on different
29 stakeholder interests.

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- 1 (e) No, for the reasons given in (c).

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1 **Request IR-53:**

2
3 **Mr. Levitan asserts that “the vetting process is another way to allow for skewing the**
4 **modelling results in the desired direction.” (Appendix A Page 65)**

5
6 **(a) Please distinguish between this feature of the vetting process and the development of**
7 **a DSM portfolio by hand.**

8
9 **(b) Please provide Mr. Levitan’s estimate of the percentage of DSM program**
10 **administrators that use an optimization model to develop their DSM plan, without**
11 **any human intervention or review.**

12
13 **(c) Please identify any and all DSM portfolios that Mr. Levitan believes have been**
14 **properly developed, without the possibility of the program administrator “skewing”**
15 **the results.**

16
17 **Response IR-53:**

18
19 **From Richard Levitan, Levitan & Associates, Inc.:**

20
21 **(a) Either computer-aided or by-hand development of a program may mask certain biases or**
22 **inefficiencies if the process is not open to review and critique. However, as is often**
23 **noted, computer models are often developed into quite complex tools that are difficult to**
24 **understand and review. They often offer a “black box” layer of insulation against**
25 **transparency, particularly when part or all of the model software is a licensed third-party**
26 **application, or an in-house tool that is under-documented and under-tested due to its**
27 **limited user base.**
28

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- 1 (b) Zero. I am not suggesting that an automaton should be in control of program
2 development. Instead, it is the proper roles of human, design, oversight, and intervention
3 in the iterative model development process.
4
- 5 (c) Zero. Again, as in (b), a human role always may lead to a bias in the program design and
6 outcome, but the issue is to ensure the integrity of the model development process from
7 the perspectives of all stakeholder interests. Transparency is key. In my opinion,
8 EfficiencyOne has not adequately promoted transparency goals because of the black box
9 layer of insulation against transparency.

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1 **Request IR-54:**

2
3 **Mr. Levitan asserts that “the \$27 million E1-Navigant A and the \$34 million E1-Navigant**
4 **A scenarios offer a better balance of costs and benefits than EfficiencyOne’s Preferred**
5 **Plan. At lower investment levels, more DSM benefits can be achieved at a much lower**
6 **capital outlay.” (Appendix A Page 70)**

7
8 **(a) Mr. Levitan’s Figure 20 shows lower energy savings and demand reductions in both**
9 **the scenarios that Mr. Levitan prefers. Please explain how this constitutes “more**
10 **DSM benefits ...at a much lower capital outlay.”**

11
12 Response IR-54:

13
14 **From Richard Levitan, Levitan & Associates, Inc.:**

15
16 (a) The Consumer Advocate may have misinterpreted Figure 20. This figure shows energy
17 savings and peak demand reduction unit costs not energy savings and demand reduction.
18 The \$27 million E1-Navigant A and the \$34 million E1-Navigant A scenarios both show
19 lower energy savings and peak demand reduction unit costs relative to EfficiencyOne’s
20 Preferred Plan.