

EFFICIENCY NOVA SCOTIA

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

- and –

IN THE MATTER OF Efficiency Nova Scotia's
2017 Annual Progress Report.

ENS 2017 DSM Annual Progress Report

Date Filed:
March 29, 2018



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1 2017 DSM RESULTS

In its Order dated October 7, 2015, the Nova Scotia Utility and Review Board (UARB) approved ENS's 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.¹ The UARB Order approved a 2017 DSM investment of \$34.0 million with corresponding net incremental energy savings of 136.5 GWh and net peak demand savings of 21.0 MW.

Table 1 provides a breakdown of the 2017 expenditures and the evaluated net incremental energy and net peak demand savings results by program, for comparison with the 2016-2018 DSM Plan Compliance Filing and the 2017 mid-course adjustments. Table 2 provides program participation data and Table 3 provides a breakdown of unit costs.

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

1 Table 1: 2017 Planned Savings, Mid-Course Adjustments, and Results

	2017 Plan as Filed				2017 Mid-Course Adjustment				2017 Results				
	First-Year Energy Savings (GWh)	Lifetime Energy Savings ¹ (GWh)	Peak Demand Savings (MW)	Budget (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings ¹ (GWh)	Peak Demand Savings (MW)	Budget (\$ million)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh) ¹	Peak Demand Savings (MW)	Expenditures (\$ million)	Program Status ²
Residential													
Efficient Product Rebates	12.6	122.7	1.1	3.3	22.6	339.8	3.6	5.2	22.6	202.2	3.0	4.2	●
Instant Savings					20.0	317.9	3.3	3.5	19.5	179.1	2.6	2.8	
Appliance Retirement					2.6	21.9	0.3	1.7	3.1	23.1	0.4	1.4	
Existing Residential	43.3	847.5	7.9	10.6	33.4	538.3	6.5	8.2	27.9	351.4	7.2	7.2	●
Home Energy Assessment					5.4	144.5	1.3	2.2	7.0	140.1	2.0	2.3	
Green Heat					3.5	63.6	1.7	0.9	3.0	53.9	3.1	1.2	
Efficient Product Installation ³					24.4	330.3	3.6	5.2	17.9	157.3	2.1	3.7	
New Residential	3.9	117.0	1.1	1.3	4.0	139.3	0.9	1.8	3.4	101.2	1.0	1.4	●
New Home Construction					4.0	139.3	0.9	1.8	3.4	101.2	1.0	1.4	
Residential Subtotal	59.8	1,087.3	10.1	15.2	60.0	1,017.3	11.1	15.3	53.9	654.8	11.1	12.8	
Low Income ⁴	7.8	151.3	1.0	1.8	9.5	128.4	1.4	2.4	9.0	79.3	1.2	2.2	
Business, Non-Profit and Institutional (BNI)													
Efficient Product Rebates	32.6	428.6	5.3	5.7	37.2	410.3	5.9	6.2	46.6	547.1	7.3	6.8	●
Business Energy Rebates					37.2	410.3	5.9	6.2	46.6	547.1	7.3	6.8	
Custom Incentives	34.1	522.7	4.3	6.5	30.5	380.0	2.2	6.0	22.4	320.2	3.9	4.2	●
Custom					24.8	374.3	1.9	4.8	21.0	316.1	3.6	3.7	
Energy Management Information Systems					4.0	4.0	0.1	0.5	1.4	4.1	0.3	0.2	
Strategic Energy Management ⁵					1.7	1.7	0.2	0.7	0.0	0.0	0.0	0.3	
Direct Installation	10.0	139.9	1.4	3.6	8.8	116.1	1.9	3.9	7.9	100.9	1.4	3.8	●
Small Business Energy Solutions					8.8	116.1	1.9	3.9	7.9	100.9	1.4	3.8	
BNI Subtotal	76.7	1,091.2	11.0	15.8	76.5	906.4	10.0	16.1	76.9	968.2	12.5	14.8	
Low Income ⁴	-	-	-	-	4.0	50.1	0.6	0.9	5.5	69.3	1.1	0.9	
Programs Total	136.5	2,178.4	21.0	31.0	136.5	1,923.8	21.0	31.3	130.7	1,622.9	23.7	27.6	
Enabling Strategies	-	-	-	3.1	-	-	-	3.3	-	-	-	2.8	
TOTAL	136.5	2,178.4	21.0	34.0	136.5	1,923.8	21.0	34.6	130.7	1,622.9	23.7	30.3	

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

4 ¹ As agreed to in the UARB-approved 2016-2018 DSM Plan Consensus Agreement, ENS is now reporting on lifetime energy savings. See M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix D, Appendix "A", item 3(c)(iii) (available on CanLII). The methodology for estimating lifetime energy savings for the 2017 Mid-Course Adjustments and 2017 results is more sophisticated than that used in the UARB-approved 2016-2018 DSM Plan and remains under development and subject to change.

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

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

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

8 ⁵ Due to the start date of the 2017 Strategic Energy Management (SEM) participants, SEM did not have any participants who achieved savings in 2017; therefore, no evaluation was conducted for 2017. Please refer to section 1.3.2 for more information.

Table 2: 2017 Participation Rates

	2017 Actual	Participation Unit
Residential		
Efficient Product Rebates		
Instant Savings	710,540	Units rebated
Appliance Retirement	6,138	Units rebated
Existing Residential		
Home Energy Assessment	931	Housing units
Green Heat	1,629	Housing units
Efficient Product Installation	13,672	Housing units
New Residential		
New Home Construction	426	Participants
BNI		
Efficient Product Rebates		
Business Energy Rebates - Mail-In	33,205	Units rebated
Business Energy Rebates - Instant	315,867	Units rebated
Custom Incentives		
Custom	78	Projects
Energy Management Information Systems*	7	Participants
Strategic Energy Management*	2	Participants
Direct Installation		
Small Business Energy Solutions	417	Projects

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

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

Table 3: 2017 Unit Cost

	First-Year Unit Cost (\$/kWh)		
	2017 Plan as Filed	Mid-Course Adjustment	2017 Actual
Residential			
Efficient Product Rebates	0.26	0.23	0.19
Instant Savings			
Appliance Retirement			
Existing Residential	0.24	0.25	0.26
Home Energy Assessment			
Green Heat			
Efficient Product Installation			
New Residential	0.33	0.45	0.41
New Home Construction			
Residential Subtotal	0.25	0.25	0.24
Low Income	0.23	0.25	0.25
BNI			
Efficient Product Rebates	0.17	0.17	0.15
Business Energy Rebates - Mail-In			
Business Energy Rebates - Instant			
Custom Incentives	0.19	0.20	0.19
Custom			
Energy Management Information Systems			
Strategic Energy Management			
Direct Installation	0.36	0.44	0.48
Small Business Energy Solutions			
BNI Subtotal	0.21	0.21	0.19
Low Income	-	0.23	0.17
Programs Total	0.23	0.23	0.21
Enabling Strategies	-	-	-
Total	0.25	0.25	0.23

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

1.1 2017 DSM Programs

In 2017, ENS achieved total net incremental energy savings at the generator, for all DSM programs, of 130.7 GWh, compared to the planned savings amount of 136.5 GWh. Total net peak demand savings at the generator, for all DSM programs, were 23.7 MW, compared to the planned savings amount of 21.0 MW. Total expenditures were \$30.3 million, compared to the mid-course adjusted planned investment of \$34.6 million.² These savings and expenditures include results from both the Residential and the Business, Non-Profit and Institutional (BNI) sectors. Total ratepayer benefits resulting from 2017 energy savings are \$121 million.³ Individual program results are presented in the following sections and are compared to the 2017 mid-course adjustments at the program level.

Using the average NS Power emissions intensity for 2016, ENS's Evaluation Consultant found that DSM measures installed in 2017 will result in 85.4 kt of annual avoided CO₂e emissions; this is approximately the same as the CO₂e emissions produced annually by 18,000 cars. These greenhouse gas savings will persist for the life of installed measures, at a reduced impact each year, proportional to the average NS Power emissions intensity.

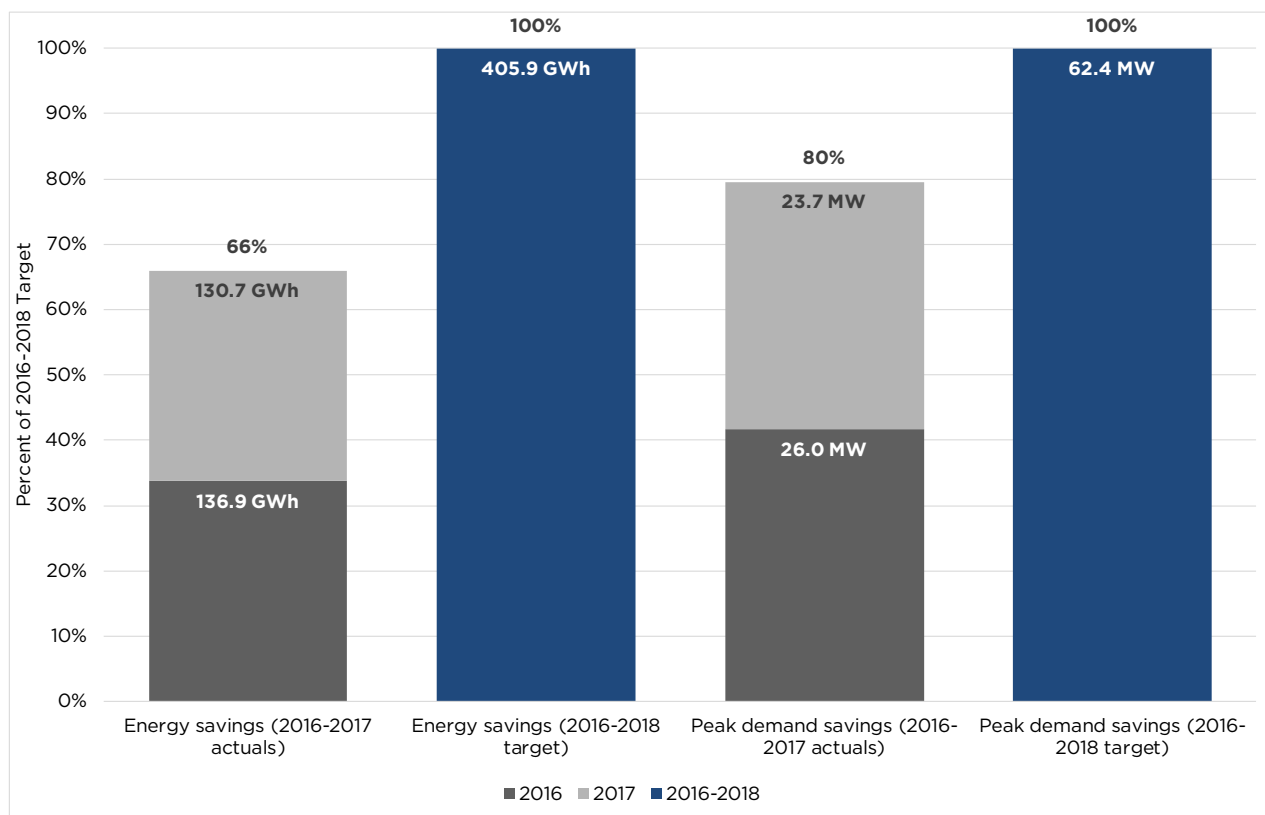
Figure 1 below shows ENS's progress to date towards the UARB-approved net incremental energy and net peak demand savings targets in ENS's 2016-2018 DSM Resource Plan and the corresponding 2016-2018 DSM Plan Consensus Agreement.⁴

² In 2017, ENS's mid-course adjusted investment amount was \$0.6 million greater than that identified in the Compliance Filing, bringing the total mid-course adjusted planned investment amount to \$34.6 million. This adjustment includes a portion of the amount underspent by ENS in 2016 and carried forward to 2017.

³ Lifetime benefits are expressed as the net present value of the avoided costs, including energy and capacity, over the life of the program measures.

⁴ *Supra* note 1 at Schedule B. The Consensus Agreement was signed by representatives of EfficiencyOne, NS Power, the Consumer Advocate, the Small Business Advocate, the Industrial Group, the Affordable Energy Coalition, and the Ecology Action Centre.

Figure 1 - 2016-2017 DSM Results as Compared to 2016-2018 Targets



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

Measurement and Evaluation

In 2017, ENS contracted two consultants to perform evaluation services. One evaluator conducted DSM program evaluations and the second conducted program support process evaluations (Marketing and Practices & Procedures). For simplicity, this document will refer to both of ENS's evaluation consultants as the Evaluation Consultant.

Further to the 2017 evaluated net incremental energy and net peak demand savings attributable to DSM programs, the 2017 evaluated net incremental energy savings for Codes and Standards were 21.9 GWh with net peak demand savings of 4.0 MW. Since savings from Codes and Standards occur outside of DSM programs, they are not included in ENS's overall actual savings.

1 In 2017, all program components underwent an impact and market evaluation with the
2 exception of:

- 3 • Appliance Retirement, which was not recommended by the Evaluation
4 Consultant for a market evaluation;⁵ and
- 5 • Strategic Energy Management, which did not receive an impact or market
6 evaluation since it did not claim any savings in 2017 (please refer to section 1.3.2
7 for further discussion).

8
9 Impact evaluations assess net incremental energy and net peak demand savings, while
10 market evaluations characterize market conditions, assess program satisfaction, and
11 monitor market evolution. For select program components, the market and impact
12 evaluations were reduced as compared to 2016. This is a result of key savings and
13 market parameters remaining stable for several years, as well as an absence of program
14 changes expected to cause fluctuations in these parameters.⁶

15
16 Two program components also underwent process evaluations: Green Heat; and
17 Custom (Retrofit service only). Process evaluations review program design,
18 effectiveness of program administration and delivery, barriers to program delivery,
19 effectiveness of tracking systems, and opportunities for improvement.

20
21 In addition, two program support process evaluations took place for:

- 22 • Marketing; and
- 23 • Practices and Procedures:
 - 24 o Training and development;
 - 25 o Business development; and
 - 26 o Incentive setting (in accordance with ENS's Incentive Setting
27 Implementation Plan).

⁵ This is as a result of consistent participant survey results in previous years due to a stable market and the maturity of the program component.

⁶ The program components selected for reduced impact evaluations were Appliance Retirement, Instant Savings, Business Energy Rebates and Custom. Instant Savings was also selected for a reduced market evaluation. For more information regarding the rationale for reduced evaluations, please see the 2017 DSM Programs Evaluation Executive Summary, p. 5.

1 The 2017 Evaluation Reports are filed concurrently with this Annual Progress Report.

2

3 **Rate Class Expenditures**

4

5 ENS remains committed to reporting on rate-class expenditures, while aiming to

6 achieve its planned energy savings within the approved investment amount. Please see

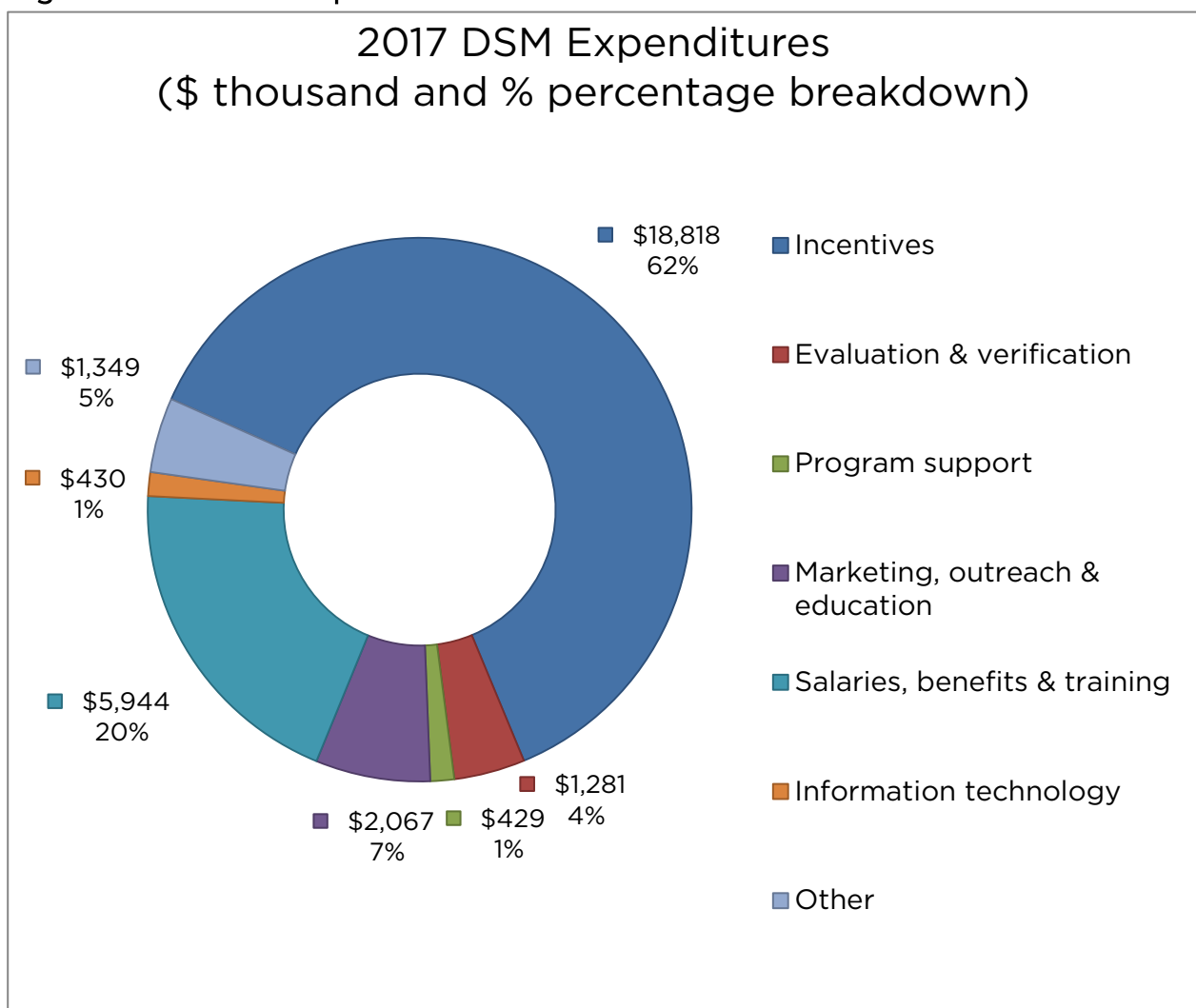
7 section 4 for 2015, 2016 and 2017 planned and actual⁷ DSM expenditures by rate class,

8 and planned 2018 DSM expenditures by rate class. Figure 2 presents ENS's 2017 DSM

9 expenditures.

⁷ Expenditures for 2017 are unaudited.

Figure 2: 2017 DSM Expenditures



Expenditure amounts are unaudited and are rounded to the nearest thousand. Expenditure amounts reported in previous quarters may have been updated and are reflected in the 2017 annual total.

In 2017, ENS continued to provide programs and services for low- and modest-income homeowners and renters, other households, and a wide variety of businesses. Awareness of, and participation in, programs and services was facilitated through advertising, media engagements, social media, and community outreach initiatives.

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

ENS continued to maintain its strong social media presence through platforms including Facebook, Twitter, Instagram, YouTube, and LinkedIn. Unaided awareness of ENS was 31 percent at the end of 2017. Customer service also remained a top priority in 2017, with ENS achieving a Customer Satisfaction Index of 89.7.

Data Tracking System

As identified in ENS's Compliance Filing for the 2016-2018 DSM Resource Plan,⁸ ENS is implementing a new DSM data tracking system. The system is a commercial product called Dynamic DSM (DDSM), which is a Microsoft® platform, and will help participants by:

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

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

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

In 2017, ENS continued implementing the DDSM data tracking system with three program components being transitioned to the new system, along with the integration of the electronic Technical Reference Manual (eTRM) for those components (for more information on the eTRM, please see section 1.5.2).⁹ Customer case management and

⁸ M06733, *The Public Utilities Act, RSNS, 1989, c 380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities* [Compliance Filing], [15 Sept 2015] at Schedule E, p 24.

⁹ The three program components are: Green Heat, Efficient Product Installation, and Appliance Retirement.

ENS's Efficiency Trade Network (ETN) list management functionality were also built into the system in 2017. In addition, testing continued on a measure library, distributor portal, and tracking components for BER (Instant Rebates) and Residential Instant Savings.

Implementation of the new DDSM data tracking system experienced delays in 2017 due to vendor development issues. ENS engaged with the vendor to mitigate risks associated with this delay.

1.2 Residential Sector Results

In 2017, the Residential sector achieved net incremental energy savings of 53.9 GWh and net peak demand savings of 11.1 MW compared to planned savings of 60.0 GWh and 11.1 MW, respectively. The Residential sector comprises the following programs:

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

The Residential sector achieved net peak demand savings that were disproportionately higher than the net incremental energy savings in 2017. This is primarily due to changes in program measure distribution in the 2017 mid-course adjustments resulting in a higher demand-to-energy ratio overall, as compared to the UARB-approved plan.

1.2.1 Efficient Product Rebates

In 2017, the Efficient Product Rebates (EPR) program achieved net incremental energy savings of 22.6 GWh and net peak demand savings of 3.0 MW, as compared to the mid-course adjusted planned savings amounts of 22.6 GWh and 3.6 MW, respectively. The EPR program comprises the following components:

- Instant Savings; and
- Appliance Retirement.

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

Table 4: EPR Rate Class Results (Residential)

Residential Efficient Product Rebates (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)	22.2	198.2	2.9	4,141	703,536
Small General (10)*	0.0	0.2	0.0	9	44
General Demand (11)*	0.0	0.2	0.0	12	61
Large General (12)*	0.0	0.0	0.0	0	2
Small Industrial (21)*	0.0	0.0	0.0	1	6
Medium Industrial (22)*	0.0	0.0	0.0	1	5
Large Industrial (23, 25)*	0.0	0.0	0.0	1	4
Municipal (24)	0.4	3.6	0.1	69	13,020
Unmetered (999)	0.0	0.0	0.0	0	0
Total	22.6	202.2	3.0	4,234	716,678

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

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

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

EPR saw a decrease in its net peak demand savings in 2017 as compared to the mid-course adjusted planned savings amount. This change was informed by ENS's 2016-2017 residential lighting metering study, to better estimate net peak demand savings, and resulted in a reduction in the energy-to-demand ratio for EPR.

The EPR unit cost for 2017 was 20 percent below the planned mid-course adjusted unit cost and was primarily influenced by an increase in the purchase of eligible ENERGY STAR® certified LED lighting product multi-packs in the Instant Savings program

component, as compared to previous years.¹⁰ The multi-packs have a lower per-kWh rebate amount than the corresponding single-packs of qualifying lighting measures, resulting in lower incentive costs for the campaigns and contributing to better-than-anticipated value for ratepayers. This factor also affected EPR expenditures, which were lower than anticipated in the mid-course adjustment. In addition, there was a higher proportion of appliance retirements and a lower proportion of replacements than expected in Appliance Retirement. Appliance replacements incur a higher cost than appliance retirements due to the expense associated with the replacement of the appliance, so a reduction in the proportion of appliance replacements decreases overall costs.

Instant Savings

Instant Savings provides point-of-sale discounts to retail customers. In 2017, Instant Savings achieved 19.5 GWh of net incremental energy savings and 2.6 MW of net peak demand savings through the sale of over 710,000 energy-efficient products, the majority of which were ENERGY STAR® certified LED lighting products.

In Q2 of 2017, Instant Savings engaged in a review of incentive levels as a result of the observed shift in the market towards the purchase of multi-packs, and also to review the impact of the price-floor introduced in 2017. ENS also began collecting more detailed data from retail partners on the sales of ENERGY STAR® certified LED lighting products, both during and outside of campaign times, to assess the effect of ENS's campaign on product sales more definitively.

The 2017 fall Instant Savings campaign included a pilot project where a new "Indoor Air Quality" product category was added offering rebates on select ENERGY STAR® certified air purifiers, dehumidifiers, bathroom fans and kitchen range hood fans. The pilot saw higher-than-anticipated sales of appliances in this new category and as a

¹⁰ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to 2 decimal places due to the relative magnitude of the figures).

result, dehumidifiers and air purifiers will be added to the list of energy-efficient products available in Instant Savings for 2018.

Appliance Retirement

In 2017, the Appliance Retirement component of the EPR program achieved net incremental energy savings of 3.1 GWh and 0.4 MW of net peak demand savings. These savings were achieved through the retirement of 6,138 inefficient appliances, including those retired through a pilot project that began in 2016.¹¹ This pilot measure was permanently incorporated into the Appliance Retirement program component during Q3 of 2017. Of the total number of appliances retired, 386 appliances were replaced with energy-efficient models through the HomeWarming service.¹²

In 2017, Appliance Retirement began a pilot project in partnership with the Halifax Regional School Board (HRSB) to recycle eligible appliances from school properties. ENS worked with the HRSB Energy Manager to communicate with school administrators about the energy savings potential of appliance retirement and to coordinate appliance pick-ups. As a result, ten schools retired inefficient appliances in 2017.

1.2.2 Existing Residential

The Existing Residential program achieved net incremental energy savings of 27.9 GWh and 7.2 MW of net peak demand savings in 2017, compared to planned savings of 33.4 GWh and 6.5 MW, respectively. Existing Residential comprises the following components:

¹¹ Effective January 2016, Appliance Retirement began offering a \$10 incentive on small appliances with an internal volume of less than 10 Cu. Ft., when accompanied by a full-size eligible appliance.

¹² HomeWarming provides low-income homeowners with a service that includes energy assessments and significant energy-saving home upgrades. Costs for appliance replacements in non-electrically heated homes are paid for by DSM funds.

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

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the Existing Residential program is presented in Table 5, below.

Table 5: Existing Residential Rate Class Results

Existing Residential (2017 actual)	First- Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Housing Units (#)*
Residential/Charitable (2,3,4)	27.5	346.3	7.1	7,036	15,934
Small General (10)	0.0	0.1	0.0	2	4
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.4	5.0	0.1	120	294
Unmetered (999)	0.0	0.0	0.0	0	0
Total	27.9	351.4	7.2	7,157	16,232

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

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

The Home Energy Assessment program component mainly comprises homes heated by electricity. However, some participation includes homes heated primarily by non-electric fuels. As these homes generate a small amount of electricity savings, they receive a small amount of DSM funding.

*Includes apartments.

The EPI program component was the primary contributor to the shortfall from the Existing Residential mid-course adjusted planned net incremental energy savings; please see the corresponding EPI section below for more detail.

Existing Residential also saw an increase in the net peak demand savings as compared to the mid-course adjusted planned amount. This was a result of the program measure changes detailed in section 1.2, as well as the residential lighting metering study discussed in section 1.2.1. While the result of the metering study had a downward effect on demand savings, the program measure changes resulted in an overall increase in demand savings for Existing Residential.

Home Energy Assessment

HEA saw a strong 2017 achieving net incremental energy savings of 7.0 GWh and net peak demand savings of 2.0 MW in 2017 with 931 participants completing upgrades and receiving rebates. This represents an increase in participation over 2016, which saw 893 participants. HEA also saw an increase in the average savings per participant in 2017 as compared to 2016, primarily due to an increase in heat pump installations.

On September 1, 2017, ENS permanently transitioned to the updated EnerGuide Rating System¹³ (ERS) from NRCAN (Natural Resources Canada), which is used within HEA to generate Homeowner Upgrade Reports and determine the EnerGuide rating for homes.¹⁴

In 2017, the HEA Energy Action Plans (EAPs) underwent a review to assess their impact on upgrades and energy savings. These supplementary reports were developed to provide additional information to participants on items including estimated costs and simple payback periods. Following the release of the new EnerGuide Rating System and the associated Homeowner Upgrade Reports, ENS suspended the release of the HEA EAPs in Q4 of 2017.

¹³ EnerGuide Rating System, version 15.

¹⁴ The EnerGuide Rating System, first developed by NRCAN in 1998, began as a unitless rating ranging from zero up a theoretical maximum of one hundred. On May 1, 2016, NRCAN released a new version of the rating system, whereby the rating reflects the energy performance of the home, in energy units of gigajoules. The rating system reflects the modelled consumption of the home, with no upper limit to the score, and where zero GJ is the best rating a home could achieve, with the help of renewables, to offset its energy usage.

ENS launched its EnerGuide Real Estate Listing pilot in Q4, in partnership with the federal and Nova Scotia provincial governments, the Nova Scotia Realtors Association, and ViewPoint Realty Services. The innovative pilot gives homeowners the option to have EnerGuide information included with their home listing on the ViewPoint.ca real estate website.

HEA also began a review of its incentive structure and rebate guide in 2017, with the objective of increasing convenience and accessibility for potential participants.

Green Heat

Green Heat achieved net incremental energy savings of 3.0 GWh and net peak demand savings of 3.1 MW in 2017. Green Heat saw 1,629 participants in 2017 which represents the largest number in its history, and a significant increase in participation as compared to 2016. These results are due to the strong performance of high-efficiency ductless mini-split heat pumps (MSHPs), which were added to Green Heat in late 2015. MSHPs accounted for 87 percent of the total measures installed in Green Heat in 2017. Additional increases in participation are attributed to the new rebate structure (detailed further below), marketing and social media initiatives, process improvements, and increased partner engagement via the ETN.

On August 1, 2017, Green Heat implemented the following changes:

- Green Heat adopted a post-purchase, mail-in rebate structure;¹⁵
- the incentive structure for heat pump equipment changed from a flat rebate per system installed to a rebate per ton of installed heating capacity; and
- Green Heat began providing incentives for residential homes that are not primarily electrically heated to install a qualifying high-efficiency heat pump instead of a standard heat pump (Green Heat claims the incremental savings resulting from a participant installing a qualifying high-efficiency heat pump

¹⁵ Prior to August 1, 2017, Green Heat applicants required pre-approval prior to purchasing and installing eligible systems.

1 instead of a standard heat pump). These new incentives capture what would
2 otherwise be a lost opportunity.

3
4 Following the introduction of these changes, and the receipt of initial savings results,
5 ENS determined that air-source heat pumps (centrally ducted), ground-source heat
6 pumps, and air-to-water heat pumps for participants that were not primarily electrically
7 heated did not produce energy savings high enough for the intended incentive to be
8 cost-effective and these were subsequently removed from the list of qualifying
9 measures on November 20, 2017.¹⁶ Homes that are not primarily electrically heated can
10 now only receive rebates when installing high-efficiency MSHPs.

11 12 **Efficient Product Installation¹⁷**

13
14 The majority of the 2017 Existing Residential savings are attributed to the EPI program
15 component, which achieved 17.9 GWh of net incremental energy savings and 2.1 MW of
16 net peak demand savings in 2017. Partner organizations installed nearly 380,000
17 energy-efficient products in over 13,000 residences across Nova Scotia, of which,
18 approximately half self-identified as, or were estimated to be, low-income households.

19
20 EPI saw lower-than-anticipated net incremental energy savings in 2017 due to:

- 21
 - fewer-than-anticipated participants; and

¹⁶ Prior to the qualified measure change on November 20, 2017, participants were permitted 90 days to purchase and install their system before sending in their application. This resulted in some cases where applications were processed after November 20, 2017 due to participants having downloaded the application before the changes were incorporated.

¹⁷ EPI consists of the former Residential Direct Install (RDI) and Rental Properties and Condos (RPC) program components within the Existing Residential program. These two components merged to form EPI on January 1, 2017, facilitating the offering of a more consistent line of products in households across Nova Scotia. Efficient Product Installation (EPI) was previously referred to as Residential Direct Install (RDI) in the 2017 Mid-Course Adjustment filing within ENS's 2017 DSM Annual Progress Report (see M07964, *The Public Utilities Act, RSNS 1989, c 390, as amended and Efficiency Nova Scotia's 2017 Annual Progress Report* [ENS 2017 DSM Annual Progress Report], [31 Mar, 2017]). The RDI program component name was changed to EPI in 2017 to more accurately reflect the service offered, however, the mid-course adjusted plan amounts remain the same.

- lower-than-anticipated energy savings per participant.¹⁸

Lower-than-expected participation in EPI also affected the annual expenditures for Existing Residential, which were lower than anticipated as compared to the 2017 planned mid-course adjusted amount. This is a result of the reduction in the number of measures installed through the EPI program component.

In Q4 of 2017, EPI offered LED holiday lights as a pilot measure in conjunction with standard upgrades. ENS offered participants one set of LED lights in exchange for two sets of traditional incandescent lights, with a limit of two sets of LED lights per household. A total of 1,319 sets of holiday lights were exchanged in EPI participants' homes.

1.2.3 New Residential

In 2017, the New Residential program, marketed as New Home Construction (NHC), achieved 3.4 GWh of net incremental energy savings and 1.0 MW of net peak demand savings as compared to the mid-course adjusted planned savings of 4.0 GWh and 0.9 MW, respectively.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the New Residential program is presented in Table 6, below.

¹⁸ More products were installed per EPI participant in 2017 due to a higher proportion of single-family homes participating than apartments (homes of a larger dwelling size typically have more installation opportunities), however, fewer A-type lamp replacements occurred in single-family homes in 2017 as compared to 2016. This is largely due to the decreasing number of lighting sockets occupied by incandescent bulbs. This is likely due to participants replacing incandescent bulbs with other lighting technologies as they burn out, but prior to participation in EPI. Please refer to the 2017 Existing Residential Evaluation Report for further information.

Table 6: New Residential Rate Class Results

New Residential (2017 actual)	First- Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Participants (#)
Residential/Charitable (2,3,4)	3.2	97.1	0.9	1,258	403
Small General (10)	0.0	0.0	0.0	0	0
General Demand (11)	0.0	0.0	0.0	0	0
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.0	0.0	0.0	0	0
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.1	4.1	0.0	126	23
Unmetered (999)	0.0	0.0	0.0	0	0
Total	3.4	101.2	1.0	1,383	426

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

New Residential includes the New Home Construction program component.

NHC saw an increase in registrations in 2017 compared to 2016, however, fewer projects were completed than expected, resulting in a shortfall in net incremental energy savings as compared to the mid-course adjusted planned savings.

This is primarily due to one of the largest NHC Service Providers transitioning out of the program in 2017. ENS worked closely with the Service Provider to assist them in navigating the exit and to aid in the completion of the Service Provider's remaining projects. In addition, a number of participants working with the exiting Service Provider were assisted by ENS in transitioning to other Service Providers. This also affected the expenditures for 2017, which were lower than anticipated as compared to the mid-course adjustment, due to fewer incentives being issued.

To address program participants' ongoing feedback indicating a need for higher incentives to facilitate building energy-efficient homes, as well as Evaluation Consultant

1 and Savings Verification Consultant recommendations, ENS updated its NHC incentives
2 in Q2 of 2017.¹⁹

3
4 In 2016, ENS launched a Passive House pilot to encourage more Passive House
5 construction, as well as energy modeling in Passive House Planning Package (PHPP) or
6 WUFI® Passive for single-family new home construction. In 2017, six projects were
7 completed with additional completions anticipated in 2018. Energy savings generated
8 from these homes will have longer measure lives (achieving greater lifetime energy
9 savings) than non-Passive House NHC projects.

10
11 As noted above in the *Home Energy Assessment* section, in Q3 of 2017, ENS transitioned
12 to the updated ERS from NRCan, which is used within NHC to rate the energy efficiency
13 of home plans and completed projects.

14 15 **1.3 Business, Non-Profit and Institutional Sector Results**

16
17 The Business, Non-Profit and Institutional (BNI) sector achieved net energy savings of
18 76.9 GWh and 12.5 MW of net peak demand savings in 2017, compared to its planned
19 savings of 76.5 GWh and 10.0 MW, respectively. The BNI sector comprises the following
20 programs:

- 21 • Efficient Product Rebates;
- 22 • Custom Incentives; and
- 23 • Direct Installation.

24
25 For BNI programs, ENS continued its On-site Energy Manager (OEM) partnership
26 initiative in 2017. Under this initiative, ENS places an energy manager within a large
27 organization to identify new energy-efficiency projects and to support the organization

¹⁹ New Home Construction Program, *2015 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 3 March 2016, Econoler at Recommendation 2015 NHC-R2; Verification Review of Program Year 2015 Evaluation Results: Report for the Nova Scotia Utilities and Review Board, 31 May 2015 [*sic*], H. Gil Peach & Associates/Scan America® at p 43-44; and New Residential Program, *2016 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 8 March 2017, Econoler at p. 5 and 24.

1 in advancing these projects. OEM services are paid for by the organization, in part
2 through a recovery on project incentives. In 2017, two additional OEM partnerships
3 began, bringing the total number of placements to six. Savings from the OEM service
4 are claimed within the three BNI programs listed above.

5
6 The BNI sector achieved net peak demand savings that were disproportionately higher
7 than the net incremental energy savings in 2017. This is primarily due to changes in
8 program measure distribution in the 2017 mid-course adjustments resulting in a higher
9 demand-to-energy ratio overall, as compared to the UARB-approved plan.

11 1.3.1 Efficient Product Rebates

12
13 Efficient Product Rebates, marketed as Business Energy Rebates (BER), achieved net
14 incremental energy savings of 46.6 GWh in 2017 and 7.3 MW of net peak demand
15 savings, compared to the planned savings of 37.2 GWh and 5.9 MW, respectively.

16
17 A breakdown of 2017 net incremental energy and net peak demand savings,
18 expenditures, and participation by rate class for the BNI EPR program is presented in
19 Table 7, below.

Table 7: EPR Rate Class Results (BNI)

BNI Efficient Product Rebates (2017 actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Units Rebated (#)
Residential/Charitable (2,3,4)*	2.9	34.2	0.5	445	22,601
Small General (10)	2.8	33.6	0.4	447	20,049
General Demand (11)	28.6	340.1	4.7	4,070	198,034
Large General (12)	3.1	36.3	0.4	421	26,902
Small Industrial (21)	2.8	29.9	0.4	437	25,270
Medium Industrial (22)	2.2	26.1	0.3	282	23,095
Large Industrial (23, 25)	2.5	28.1	0.3	382	19,596
Municipal (24)	1.7	18.7	0.3	341	13,525
Unmetered (999)	0.0	0.0	0.0	0	0
Total	46.6	547.1	7.3	6,825	349,072

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

BNI Efficient Product Rebates includes the BER program component.

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

EPR achieved its highest energy savings levels in the program's history through the sale of over 349,000 energy-efficient products through the Instant Rebates and Mail-In services. The Instant Rebates service observed continued growth and increased participation in 2017 as compared to recent years, while the number of Mail-In projects has remained relatively constant.

In 2017, BER was expanded to include pool equipment as a new measure category. The most popular measures continue to be lighting and heating, ventilation, and air conditioning (HVAC).

EPR's strong energy and demand savings results are attributed to additional Business Development Manager and OEM support, along with momentum gained as a result of marketing efforts that took place in late 2016.

As a result of the increase in participation observed, program expenditures also increased as compared to the amount forecast in the mid-course adjustment, however, the EPR unit cost was reduced by 13 percent.²⁰ The stronger-than-anticipated performance of the Instant Rebates service, which has a lower unit cost than that of the Mail-In service, contributed to the reduction in the unit cost, thus resulting in better-than-anticipated value for ratepayers.

BER also underwent a process improvement exercise in 2017, resulting in revisions to the website and streamlining of the application process to enhance the participant experience.

1.3.2 Custom Incentives

The Custom Incentives program achieved net incremental energy savings of 22.4 GWh and 3.9 MW of net peak demand savings in 2017, as compared to the planned savings amounts of 30.5 GWh and 2.2 MW, respectively. Custom Incentives comprises the following program components:

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

In 2017, Custom Incentives supported innovative projects that did not qualify for other ENS programs by offering technical assistance, financial incentives, and project financing to participants to aid in the reduction of their electricity consumption and demand.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for Custom Incentives is presented in Table 8, below.

²⁰ This variance amount was calculated using input values with a higher number of decimal places as compared to the unit cost amounts provided in Table 3 (where first-year unit cost amounts are provided to two decimal places due to the relative magnitude of the figures).

Table 8: Custom Incentives Rate Class Results

Custom Incentives (2017 actual)	First- Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Projects (#)
Residential/Charitable (2,3,4)*	0.2	2.4	0.0	36	1
Small General (10)	0.0	0.0	0.0	0	0
General Demand (11)	8.6	130.1	1.4	1,500	28
Large General (12)	4.0	59.8	1.4	765	13
Small Industrial (21)	2.0	30.6	0.1	439	8
Medium Industrial (22)	3.2	43.5	0.5	505	17
Large Industrial (23, 25)	3.5	41.7	0.3	766	17
Municipal (24)	0.9	12.1	0.2	190	2
Unmetered (999)	0.0	0.0	0.0	0	0
Total	22.4	320.2	3.9	4,202	87

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

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

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

Custom Incentives fell short of its 2017 planned net incremental energy savings as a result of lower-than-anticipated savings in each of the three Custom Incentives program components; please refer to the discussions below for further information. Custom Incentives expenditures were also reduced, in alignment with the shortfall in net incremental energy savings.

Custom observed a significant increase in the net peak demand savings as compared to the mid-course adjusted planned amount. This is due to program measure changes as well as the realization of unanticipated demand savings in the New Construction service (within the Custom component) that were credited through the evaluation process.

Custom

The Custom component of the Custom Incentives program generated 21.0 GWh of net incremental energy savings and 3.6 MW of net peak demand savings in 2017 from 78 projects.

The Custom component comprises three separate services: Retrofit; Building Optimization; and New Construction. These services saw 146, 34 and 29 projects initiated in 2017, respectively, representing a 55 percent increase over the number of project initiations in 2016.²¹

The Retrofit service claimed savings from 64 projects in 2017, accounting for the majority of savings achieved through the Custom component, with projects spanning a wide variety of sectors, including:

- water and wastewater treatment;
- seafood processing and aquaculture;
- commercial office space;
- new construction; and
- institutional.

The greatest savings from the Retrofit service in 2017 came from HVAC, followed by compressed air, and refrigeration.

In 2017, seven projects generated savings in the Building Optimization service through the implementation of no-cost or low-cost energy-efficiency measures identified through a recommissioning process.

²¹ Project initiation is defined by the date a project is created in the Data Management System. This typically occurs when ENS receives a Scoping Study, Feasibility Study Proposal or Feasibility Study Report.

The New Construction service also achieved savings from seven projects in 2017. This service encourages participants to make decisions that are informed by their anticipated operating costs, and offers technical support and incentives resulting in electricity savings in new BNI buildings, as well as major renovations to existing buildings.

The Custom component initiated five pilots in 2017, as follows:

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

Custom saw fewer-than-anticipated project completions in 2017 as well as lower-than-expected net incremental energy savings per participant. A number of Custom projects expected to complete in 2017 were affected by participant-driven timeline delays; these projects are now expected to complete in 2018 as a result. This contributed to the shortfall in the net incremental energy savings for Custom Incentives, as compared to the planned savings amount for 2017.

Energy Management Information Systems

EMIS achieved net energy savings of 1.4 GWh and net peak demand savings of 0.3 MW in 2017. EMIS aims to help institutional and industrial participants use energy consumption data from metered systems to inform their process decisions. This involves helping participants conduct an EMIS audit, develop an EMIS implementation plan, and implement the EMIS plan (involving the installation and configuration of metering and monitoring equipment, and training and organizational support).

EMIS savings were lower than anticipated in 2017 as a portion of participants had not advanced as far in their EMIS implementation as forecasted at the time of the 2017 mid-course adjustment.

Strategic Energy Management

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

- facilitated workshops for energy team members;
- energy assessments;
- energy mapping and monitoring;
- tracking and reporting; and
- employee engagement activities.

In past years, SEM used a cohort delivery model to promote collaboration between industries. Due to difficulty filling the 2017 SEM cohort spaces, SEM participants did not begin until October. As a result of the revised start date, ENS did not evaluate or claim SEM savings in 2017; savings generated by these participants will be claimed in 2018. ENS is actively working to increase SEM participation, as detailed further in section 3.2.2.

1.3.3 Direct Installation

The Direct Installation program, marketed as Small Energy Business Solutions (SBES), achieved net incremental energy savings of 7.9 GWh and net peak demand savings of 1.4 MW in 2017, as compared to the planned mid-course adjusted savings of 8.8 GWh and 1.9 MW, respectively.

A breakdown of 2017 net incremental energy and net peak demand savings, expenditures, and participation by rate class for the SBES program is presented in Table 9, below.

Table 9: Direct Installation Rate Class Results

BNI Direct Installation (2017 actual)	First- Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ thousand)	Projects (#)
Residential/Charitable (2,3,4)	1.1	15.0	0.2	513	69
Small General (10)	0.8	10.5	0.1	389	78
General Demand (11)	5.4	68.2	0.9	2,632	252
Large General (12)	0.0	0.0	0.0	0	0
Small Industrial (21)	0.4	5.4	0.1	134	10
Medium Industrial (22)	0.0	0.0	0.0	0	0
Large Industrial (23, 25)	0.0	0.0	0.0	0	0
Municipal (24)	0.1	1.7	0.0	85	8
Unmetered (999)	0.0	0.0	0.0	0	0
Total	7.9	100.9	1.4	3,753	417

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

Direct Installation includes the Small Business Energy Solutions program component.

In 2017, SBES saw 417 projects, a significant increase over the prior year, resulting in an increase in net incremental energy savings of over 90 percent as compared to 2016. This positive trend is attributed to process enhancements made in 2016 resulting in an increased uptake of SBES as well as an increase in the number of projects generated through, and referred from, contractors. During 2017, SBES continued to enable participants to find contractors through the ETN or use a contractor of their choosing.

Despite this positive trend, SBES fell short of its 2017 planned mid-course adjusted savings as a result of lower-than-anticipated savings generated through the Multifamily Affordable Housing Pilot. This pilot, which began in 2016, provides affordable-housing owners with incentives for building-wide, energy-retrofit projects. The delivery of this pilot uses the same framework as the SBES delivery model, with the addition of an affordable-housing criterion rather than an energy consumption requirement. The pilot achieved the initial target level of participation by the end of 2016 with 17 participants undergoing an energy audit to identify energy-efficient upgrade opportunities. Participant feedback indicated that additional time is needed to make decisions

1 regarding the energy-efficient upgrades recommended in the upgrade reports and that
2 pilot participants did not have sufficient available capital even with the incentive levels
3 being offered. In 2017, SBES continued to work with pilot participants to support them
4 in implementing the recommended changes and, as a result, saw the completion of ten
5 projects for two pilot participants.

6
7 SBES's energy savings were also affected by the evaluation process, which saw a
8 reduction in the net incremental energy savings as compared to the planned savings
9 and ENS's tracked results for 2017. This was a result of baseline adjustments for specific
10 products and adjustments to hours-of-use for particular measures. This did not affect
11 SBES expenditures, which were aligned closely with the mid-course adjusted planned
12 amount.

13
14 SBES also saw lower-than-anticipated net peak demand savings due to a lower-than-
15 anticipated number of energy-efficiency upgrades taking place for the Multifamily
16 Affordability Housing Pilot, as well as adjustments made to peak demand savings
17 through the evaluation process; please refer to the Direct Installation Evaluation report
18 for further information.²²

20 1.4 Low Income Highlights

21
22 Within the Residential and Business, Non-Profit and Institutional (BNI) results
23 highlighted in Table 1, ENS supported the following work for low-income Nova Scotians
24 in 2017 (based on direct information where provided or demographic data):

- 25 • 6,882 low-income Nova Scotians received free installation of low-cost energy
26 efficiency measures through the Efficient Product Installation program
27 component;
- 28 • 466 low-income participants received rebates to replace or retire old, inefficient
29 appliances;

²² Direct Installation Program, *2017 DSM Evaluation: Efficiency Nova Scotia*, Final Report, 15 March 2017, at p. 29.

- 30,690 units were sold or replaced through the Residential and BNI Efficient Product Rebates programs, via the Residential Instant Savings program component and the BNI Business Energy Rebates (Instant Rebates service) program component; and
- 64 apartment buildings received rebates through BNI programs, resulting in energy savings for the low-income Nova Scotians who live in those buildings.

SBES Affordable Multifamily Housing Pilot

As indicated above, in late 2016, ENS launched an SBES pilot for affordable housing owners, called the SBES Affordable Multifamily Housing Pilot. The pilot provides energy audits, upgrade recommendations, and building-wide efficient product installations. Please refer to section 1.3.3 for additional information on this pilot.

Incidental Low-Income Impacts

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

Table 10: Low Income Results

Low Income Participation (2017 Actual)	First-Year Energy Savings (GWh)	Lifetime Energy Savings (GWh)	Peak Demand Savings (MW)	Expenditures (\$ million)	Participation (#)	Participation Unit
Residential Programs						
Efficient Product Rebates	0.6	4.9	0.1	0.3		
Instant Savings ¹	0.3	2.5	0.0	0.0	4,725	Units rebated
Appliance Retirement ^{1,2}	0.3	2.4	0.0	0.3	466	Units rebated
Existing Residential	8.5	74.4	1.1	1.9		
Home Energy Assessments ³	-	-	-	-	-	
Green Heating Systems ³	-	-	-	-	-	
Efficient Product Installation Service ⁴	8.5	74.4	1.1	1.9	6,882	Housing units
New Residential	0.0	0.0	0.0	0.0		
New Home Construction ³	-	-	-	-	-	
Residential Subtotal⁹	9.0	79.3	1.2	2.2	12,073	
Business, Non-Profit and Institutional (BNI) Programs						
Efficient Product Rebates	3.8	45.1	1.0	0.5		
Business Energy Rebates - Mail-In ^{6,7}	1.3	15.8	0.5	0.2	42	Buildings retrofitted
Business Energy Rebates - Instant ^{6,8}	2.5	29.2	0.5	0.4	25,965	Units rebated
Custom Incentives	1.4	20.9	0.1	0.2		
Custom ^{6,7}	1.4	20.9	0.1	0.2	11	Buildings retrofitted
Energy Management Information Systems ³	-	-	-	-	-	
Strategic Energy Management ³	-	-	-	-	-	
Direct Installation	0.3	3.4	0.1	0.1		
Small Business Energy Solutions ^{6,7}	0.3	3.4	0.1	0.1	11	Buildings retrofitted
BNI Subtotal⁹	5.5	69.3	1.1	0.9	26,029	
Programs Total⁹	14.5	148.6	2.3	3.1	38,101	

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

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

² Includes appliance replacements delivered through the HomeWarming service.

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

⁴ Income disclosure is optional for program participation. Low-income participants are tracked where income information is available (88% of projects); otherwise low-income Nova Scotians are assumed to participate in proportion to the general population within each county.

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

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

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

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

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

1.5 Enabling Strategies

Enabling Strategies played a strong role in enabling energy-efficiency services and programs to continue achieving savings in 2017. Enabling Strategies indirectly facilitate future savings within programs and have three key objectives:

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

2017 Enabling Strategies categories included:

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

1.5.1 Education and Outreach

Education and Outreach strategies in 2017 focused on encouraging participation in DSM programs by increasing Nova Scotians' awareness of the value of energy efficiency.

Engagement and reach across all social media platforms remained strong in 2017 with ENS achieving an increase in Instagram followers of 75 percent and an increase in Facebook "likes" by 17 percent, as compared to 2016. Twitter (all channels) and LinkedIn followers also increased by ten percent and nine percent, respectively. In addition, there were more than 153 media mentions during 2017, representing an increase over 2016.²³

²³ Includes references to both ENS and EfficiencyOne.

1 ENS was also featured in a number of publications in 2017, including the Halifax
2 Chamber of Commerce's *Business Voice* magazine, the *Inverness Oran* newspaper, and
3 *Seafood Alliance* magazine, highlighting ENS's energy partnerships with Nova Scotia
4 businesses and municipalities.

5
6 ENS continued its Green Schools program in 2017, with over 250 schools now taking
7 part, which is over half of all schools in Nova Scotia. Five engagement officers worked
8 to support and provide resources to teachers and Green Team leaders with the goal of
9 enhancing environmental sustainability at schools.

10
11 Green Schools Nova Scotia also participated in a variety of community events,
12 presentations and initiatives during 2017, including:

- 13 • 22 *Earth Day* related engagements across the province on April 22, 2017;
- 14 • a presentation at the EECOM (Canadian Network for Environmental Education
15 and Communication) Conference in May, 2017;
- 16 • *Energy Efficiency Day*, co-hosted with ENS at the Halifax Central Library on June
17 3, 2017; this event offered educational workshops and activities and showcased
18 Nova Scotia's energy efficiency industry;
- 19 • *FreshFest* at the Halifax Central Library on September 10, 2017;
- 20 • Hants County Exhibition in September, 2017, where engagement officers
21 demonstrated the benefits of having a well-insulated and air sealed home, with
22 the use of ENS's Passive House display;
- 23 • becoming an active member of the Environmental and Sustainability Education
24 Caucus;
- 25 • *Energize Bridgewater* from October 27-28, 2017; and
- 26 • the Girl Guides Canada Provincial Guiders Conference on November 25, 2017,
27 where there were over 300 attendees.

28
29 Partnerships between ENS and Nova Scotia's leading post-secondary institutions help
30 foster a culture of efficiency in Nova Scotia and educate tomorrow's workforce on the
31 benefits of efficiency for our economy and environment. In 2017, ENS continued to

1 sponsor courses in energy efficiency and renewable energy at Saint Mary's University
2 and Dalhousie University. The objective of these interdisciplinary courses is to build
3 capacity in Nova Scotia's renewable energy and energy-efficiency sectors, demonstrate
4 models available to deliver energy-efficiency programs, profile careers in the industry,
5 and encourage development in sustainable energy. ENS also partnered with the Nova
6 Scotia Community College (NSCC) to develop a \$1,500 scholarship award, called the
7 Efficiency Nova Scotia Bright Student Award.

8
9 ENS hosted its Bright Business Conference again in 2017. The conference was well
10 attended, with over 250 participants and provided professional development with
11 various breakout sessions throughout the day to encourage businesses to incorporate
12 energy efficiency into their operations. Businesses from across the province won
13 energy-efficiency awards in five categories.

14
15 Additional 2017 Education and Outreach initiatives and activities included:

- 16 • connecting with Nova Scotians at a variety of information sessions, events, home
17 shows and trade shows across the province to highlight ENS's residential
18 program offerings to increase energy-efficiency literacy; this included visiting
19 approximately 21 communities across Nova Scotia as part of ENS's Summer
20 Events program in 2017;
- 21 • presenting at the Core Energy Conference and the Annual General Meeting of the
22 World Energy Cities Partnership (WECP) in Halifax;
- 23 • presenting to several organizations, businesses and community groups across
24 the province, including the Atlantic Canada Opportunities Agency (ACOA), The
25 Women's Insurance Board, Girl Guides Canada and several seniors' groups;
- 26 • partnering with the Ecology Action Centre (EAC) to encourage a culture of
27 efficiency in Nova Scotia. The EAC assists ENS by identifying and working with
28 non-profit organizations throughout the province to create and implement
29 energy management plans and to assist qualifying organizations to take part in
30 ENS programs and services;

- releasing the 2016 EfficiencyOne Annual Report (distinct from the ENS Annual Progress Report);
- releasing ENS's *The Switch* Residential monthly e-newsletter and *The Switch* BNI bi-monthly e-newsletter; and
- distributing of the *Efficiency Connection* newsletter to local elected leaders, including MLAs and MPs.

Other 2017 highlights included ENS's New Home Construction Program Manager being awarded the Canada Green Building Council's Atlantic Chapter's Emerging Green Leader Award, and EfficiencyOne's Board Chair and CEO being named as recipients of Canada's 2018 Clean50 award for their industry-leading efforts promoting energy efficiency and reducing CO₂ emissions in Nova Scotia. ENS also presented awards at the Canadian Home Builders Peak Awards and received recognition for its work in the energy efficiency home-building field.

1.5.2 Development and Research

Development and Research activities during 2017 focused largely on the following initiatives:

- Incentive Setting Methodology implementation;
- Small Business Energy Study;
- electronic Technical Reference Manual (eTRM); and
- additional activities.

Further detail on these initiatives can be found below. Please refer to section 5.4 for further information on the Incentive Setting Methodology implementation.

Small Business Energy Study

During the 2016-2018 DSM Resource Plan regulatory process, the Small Business Advocate (SBA) requested that ENS undertake a Small Business Energy Study (the Study) with the scope to be developed in consultation with the SBA.

ENS and the SBA collaborated to develop the Scope of Work for the Study in 2016. The Study was conducted in the first-quarter of 2017 and will be used to better understand this market segment and the barriers faced by small businesses looking to participate in DSM programs.

Electronic Technical Reference Manual

In 2017, ENS completed its electronic Technical Reference Manual (eTRM). The eTRM is a web-based tool for storing measure-level energy and demand savings methodologies and will be fully operational once the new data tracking system is complete. Like a conventional paper TRM, the eTRM allows users to view the methodology used to calculate savings, as well as offering additional functionality and a number of benefits unique to electronic TRMs, including:

- for any given energy-efficiency measure, the eTRM serves as both a record of the applicable methodology as well as the mechanism by which savings are calculated (as opposed to using separate sources for these two functions), which can reduce error and duplication;
- a direct interface with the DDSM data tracking system to store calculation outputs from the eTRM; and
- enhanced transparency by maintaining a record of past versions if a methodology is updated, as well as a record of the period over which the methodology was active.

The eTRM is an embedded application that is integrated with ENS's DDSM data tracking system and as a result, it cannot be easily viewed or filed in isolation. ENS will make the

eTRM available for the Evaluation Consultant and Savings Verification Consultant to review and assess at the ENS offices.

The eTRM will be integrated into daily operations as the new DDSM data tracking system is developed. The eTRM is discussed further in ENS's 2017 Q3 DSM Report, filed on November 30, 2017.

Additional Activities

Additional ENS development and research activities in 2017 included recurring research to track quality assurance, participant satisfaction, and other attitudinal metrics among the general population of Nova Scotia households, to help ENS respond to changing market conditions. This research indicated that ENS's influence on helping households reduce their energy consumption remained high at 30 percent in 2017. Quality assurance and participant satisfaction surveys were also completed for applicable program components as well as participant research undertaken to understand and improve the experience at each stage of the participant journey. Finally, ENS completed a review of the economic impact of the energy-efficiency industry in Nova Scotia.

ENS also collected user experience and other behavioural information from various participant and non-participant segments. The goal of this research was to understand participant experience and behaviours as they move through various touch points with ENS. Insights gained will be used guide improvements to user experience and messaging, to help participants get the most from the energy savings opportunities available to them.

1.5.3 Other Enabling Strategies

Other Enabling Strategies included the following sub-categories in 2017:

- PACE Financing;
- Capacity Building;

- Working with Governments; and
- Regulatory Affairs.

PACE Financing

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

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

In 2017, ENS administered PACE programs for two municipalities and their residents. In total, eight municipalities are offering PACE financing to homeowners for energy-efficiency measures, and ENS continues to support these electrically-heated PACE participants with standard HEA rebates.

Capacity Building

Capacity Building strategies in 2017 focused on:

- enhancing quality assurance and existing training for ENS contractors and partners;
- providing marketing support for contractors and delivery partners;
- fostering the introduction of the Passive House concept in Nova Scotia; and
- promoting new home building standards.

Activities related to the Supplier Performance Management program, in order to improve cost and scheduling efficiencies as well as the participant experience, included:

- the procurement and awarding of Quality Assurance Auditor and Site Inspector contracts to collect Delivery Agent performance information for ENS;
- Service Provider training;
- distribution of Service Provider workloads across ENS programs and geographic regions to reduce travel cost and establish more consistency for contractors; and
- collaboration across ENS programs and departments to schedule site visits in a manner that limits the number of times participants are contacted following program participation.

2017 saw ENS continue to support and grow the energy-efficiency industry in Nova Scotia through its ETN, the goal of which is to develop a network that will, through education and engagement:

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

In 2017, the ETN continued to build on momentum gained through efforts undertaken in 2016 with highlights, including:

- the release of two mandatory training modules for ETN members on the topics of customer service and ENS services;
- the launch of an enhanced online directory with improved navigation features and search function capability;
- an ETN advertising campaign in Q2, which resulted in an increase in ETN membership;
- province-wide information sessions on the Green Heat program component changes hosted by ENS, providing the opportunity for in-person feedback and questions;
- the launch of online 'Helpful Guides' to assist participants in hiring contractors, comparing quotes, and more; and

- the distribution of six issues of *The Network News*, the ETN's bi-monthly newsletter that highlights updates on programs, pilots, procurement opportunities, helpful tips, training, events, and more.

ENS continued to strengthen its relationship with industry stakeholders throughout 2017 by hosting, sponsoring and assisting in organizing training and events, and by offering exclusive discounts to ETN members who attended. Events included:

- An ENS-sponsored training course on how to sell energy efficiently, facilitated by Mark Jewell of Selling Energy, which took place on April 24-25, 2017;
- The Smart Energy Event, an ENS-sponsored conference which took place in Halifax on April 25-26, 2017;
- Passive House Canada's Building Enclosures for High Performance Buildings training, sponsored by ENS, on October 4, 2017; and
- ENS's Bright Business Conference which took place on October 17, 2017; and
- Energy Efficiency Opportunities in Industrial Refrigeration Systems, a training course hosted by ENS on November 27, 2017.

ENS also fostered the introduction of the Passive House concept in Nova Scotia and promoted new home building standards throughout 2017.

In 2017, ENS developed a video for Housing Nova Scotia highlighting a Housing Nova Scotia project demonstrating Passive House principles. This video was released in 2017 and is featured on the ENS website.

Working with Governments

ENS seeks to drive market transformation by working with governments to promote the adoption of energy-efficiency measures by implementing codes and standards.

In 2017, ENS continued to support the development of national energy-efficiency standards by:

- evaluating the impacts of code and regulation changes annually;
- participating in and funding the Canadian Standards Association's Steering Committee on Performance Energy Efficiency and Renewables (SCOPEER) and the Strategic Resource Task Force (SRTF) committee;²⁴
- continuing to work with NRCan and the NS Department of Energy in reviewing and providing feedback on market transformation initiative for key technologies relating to Canada's Pan-Canadian Framework on Clean Growth and Climate Change;²⁵
- attending the Standards Council of Canada's (SCC) Annual General Meeting; and
- assisting the national and provincial governments with codes and standards-related activities.

These activities are intended to:

- improve the efficiency of electricity-consuming devices and equipment through either voluntary manufacturer adoption or regulation; and
- develop and advance codes and standards in provincial and national energy-efficiency regulations and policies.

In addition, ENS worked with its Evaluation Consultant to plan the 2017 evaluation of codes and standards. The 2017 Codes and Standards Evaluation report quantifies impacts within Nova Scotia's market, due to both federal and provincial code and regulation changes and additions. This evaluation included the Nova-Scotian impact of two products included in Amendment 13 to Canada's *Energy Efficiency Regulations*, namely residential clothes washers and residential refrigerators.²⁶

²⁴ The STRF funds the development of standards by SCOPEER, while SCOPEER oversees the development of Canadian energy efficiency standards.

²⁵ This work is funded through ENS's Enabling Strategies investment from the DSM fund (like other Codes and Standards related activities) and is expected to be ongoing over the next several years, given the number and scope of initiatives arising from the framework.

²⁶ Natural Resources Canada, *Notice - Publication of Energy Efficiency Regulation, 2016- Amendment 13*, December 2016, available at <<http://www.nrcan.gc.ca/energy/regulations-codes-standards/18419>> (Last accessed February 28, 2017).

Regulatory Affairs

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

In 2017, Regulatory Affairs activities included:

- engaging with regulatory stakeholders, the DSM Advisory Group and consultants, as appropriate, on topics including:
 - o the development approach for the 2019 DSM Resource Plan;
 - o quantifying non-energy benefits for cost-effectiveness testing purposes (see section 5.3 for more information);
 - o finalizing and implementing the Incentive Setting Methodology Study (see section 5.4 for more information);
 - o gaining UARB approval of EfficiencyOne's Affiliate Code of Conduct;
 - o refining the historical Rate and Bill Impact Analysis methodology;
 - o developing a Locational DSM report, in collaboration with NS Power;
 - o the provision of customer electricity data from NS Power; and
 - o ENS's 2017 historical Rate and Bill Impact Analysis.
- developing quarterly and annual UARB reports;
- holding DSM Advisory Group meetings and technical sessions;
- filing and answering Information Requests on EfficiencyOne's 2016 Audited Financial Statements;
- addressing evaluation and verification recommendations;
- coordinating the Evaluation Consultant's and Verification Consultant's site visits and facilitating the evaluation and verification processes;
- conducting a Cost Containment Audit;
- conducting an Internal Audit of Program Internal Controls – Instant Savings;²⁷

²⁷ M08011, *EfficiencyOne 2016 Audited Financial Statements*, [EfficiencyOne Response to Information Requests], [7 June 2017], at response to IR-01.

- conducting a Procurement Process Internal Audit;²⁸ and
- developing an eTRM.

Further to a direction from the UARB, ENS finalized a loan arrangement on February 1, 2017 with Toronto Dominion (TD) in the amount of the accrued return earned by NS Power on the 2015 DSM Deferral. ENS advanced this sum to NS Power and entered into an Undertaking to Pay with NS Power, whereby NS Power is obligated to make equal monthly payments that correspond in amount and timing to those that ENS is obligated to make to TD. These efforts are expected to save ratepayers approximately \$6 million.

For more information on Regulatory Affairs activities, please refer to section 5 on Deferred Items from the 2016-2018 DSM Resource Plan regulatory process, below.

²⁸ *Ibid.*

2 HST UPDATE

Effective January 1, 2015, all assets, liabilities, and fund balances of Efficiency Nova Scotia Corporation (ENSC, subsequently renamed by legislation to ENS Transition Corporation), with the exception of the DSM HST Receivable, were vested by legislation in EfficiencyOne as the first franchise holder. The DSM HST Receivable remains as an asset of ENS Transition Corporation (ENSTC).

On February 25, 2015, ENSTC received a Notice of Confirmation from the Canada Revenue Agency (CRA) Appeals Division. The notice stated that the CRA had reviewed the position taken by the CRA Audit Division and considered the additional information provided by ENSTC. It then confirmed the original ruling set out by the CRA Audit Division; CRA remains of the position that ENSC did not make a taxable supply to NS Power, and was therefore ineligible to claim Input Tax Credits.

Pursuant to section 306 of the Excise Tax Act,²⁹ in May 2015, ENSTC filed a Notice of Appeal with the Tax Court of Canada to have the CRA Appeals Division decision overturned. ENSTC remains of the view that a taxable supply was provided by delivering DSM programs and that it was entitled to claim full Input Tax Credits. Therefore, the HST receivable will remain as an asset with ENSTC until the Tax Court of Canada rules on the matter.

Discovery examination of ENSTC's nominee was conducted on July 6, 2017 and discovery of CRA's nominees were conducted on July 7, 2017 and November 9, 2017. Undertakings from discovery were satisfied on March 2, 2018 by both parties (ENSTC and CRA). A settlement conference has been scheduled for April 6, 2018. A hearing date may be set pending the outcome of the settlement discussions.

²⁹ See *Excise Tax Act*, RSC 1985, c E-15 s 306.

3 2018 PLANNED ACTIVITIES

In 2018, ENS will continue to build on its previous successes and contribute to fostering an energy efficient culture in Nova Scotia. By the end of 2018, ENS expects to meet the UARB-approved 2016-2018 DSM net incremental energy and net peak demand savings targets (at the generator) of 405.9 GWh and 62.5 MW, within the UARB-approved investment amount of \$102.2 million.³⁰ ENS will provide its mid-course adjustments for 2018 by program and their customer rate class impacts within its 2018 Q1 DSM Report, due to be filed in May, 2018.

In 2018, ENS will work with its Evaluation Consultant to design evaluations that will provide accurate results, keep to allocated evaluation budgets, and identify opportunities for continuous improvement. ENS plans to continue conducting condensed evaluations for some program components in recognition of having reached a maturity level where key savings parameters have remained stable for several years. ENS and its Evaluation Consultant will review the results of the 2017 evaluations and tailor 2018 evaluation activities accordingly; ENS will only reduce activities where any potential risks can be reasonably minimized.

ENS will also continue to work with its Evaluation Consultant to plan a program support process evaluation that will provide ENS with insights and recommendations for improvement that will help maximize ENS's impact in Nova Scotia.

To facilitate another successful year, ENS will continue its lean process improvement initiative, which will map out the participant process and streamline it where appropriate to improve the participant experience. A "lean" culture focuses on continuous improvement and analysis of the flow of services, products, and information to reduce waste and increase efficiencies. This is an ongoing process improvement approach that ENS will continue pursuing organization-wide throughout 2018.

³⁰ *Supra* note 1.

3.1 Residential Programs and Services

The 2018 Residential sector consists of the following programs:

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

3.1.1 Efficient Product Rebates

The EPR program consists of the following components:

- Instant Savings; and
- Appliance Retirement.

Instant Savings

Following the 2017 pilot introduction of the “Indoor Air Quality” category, ENS will continue offering rebates during the spring and fall 2018 campaigns for dehumidifiers and air purifiers, along with the existing Instant Savings measures; consideration of year-round rebates for these new measures will be explored with participating retailers. Rebates will no longer be offered in 2018 for kitchen range-hoods or bathroom fans due to low retailer and consumer uptake during the pilot in the fall 2017 Instant Savings campaign.

A number of marketing initiatives for Residential EPR are planned during 2018 including media and in-store advertising for the spring and fall Instant Savings campaigns, digital marketing, and EPR highlights in ENS’s *The Switch* Residential newsletter.

Appliance Retirement

In 2018, ENS will focus on generating Appliance Retirement energy savings by continuing to offer the existing retirement and replacement services, and opportunities

to deliver new initiatives. ENS will continue to work with the Halifax Regional School Board (HRSB) to retire inefficient fridges and freezers from HRSB schools and school board offices.

2018 will also see the launch of a new ENS online booking portal for Appliance Retirement, designed to improve the user experience and streamline the pick-up booking process.

Planned marketing activities include direct mail, media campaigns and in-store promotion of Appliance Retirement.

3.1.2 Existing Residential

ENS's 2018 Existing Residential program comprises the following program components:

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

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

Home Energy Assessment

HEA is a well-established and successful whole-home energy-efficiency program component. In 2018, assessments and incentives will continue to be provided for all components of a home's building envelope, space-heating equipment, and water-heating equipment. Administrative and program management processes focus on reducing barriers to make HEA easier to understand and participate in, and more straightforward to deliver. HEA will complete a review of its incentive structure and

1 rebate guide in 2018, with the objective of making HEA and its incentives more user-
2 friendly.

3
4 ENS will work to increase awareness of, and participation in the EnerGuide Real Estate
5 Listing pilot in 2018, which gives homeowners the option to have EnerGuide information
6 included with their home listing on the ViewPoint.ca real estate website.

7 8 **Green Heat**

9
10 Green Heat will continue its focus on ductless MSHPs in 2018; ductless MSHPs accounted
11 for 87 percent of the measures installed through Green Heat in 2017 and ENS expects
12 this momentum to continue in 2018. Green Heat will also continue to incent the adoption
13 of hybrid heat-pump water heaters as well as wood and pellet stoves, among other
14 measures in 2018. In addition, Green Heat will explore opportunities to add new
15 measures to its offerings.

16
17 Marketing initiatives in 2018 will include increased signage at retail locations as well as
18 engagement with contractors and manufacturers to further increase awareness and
19 understanding of Green Heat, its new rebate structure, and the incentives available.

20 21 **Efficient Product Installation**

22
23 ENS will continue to offer direct installation services to homeowners, renters, and
24 landlords in 2018 and will continue to develop strategies to achieve more savings per
25 household, as well as continue to research other potential measures that could be
26 offered.

27
28 EPI will be piloting a new measure, thermostatic shower valves, in 2018 for participants
29 with electrically-heated hot water. This is a water saving device that is designed to
30 reduce hot water and energy waste by shortening the time that hot water is left running

before the user steps into the shower. In addition, LED holiday lights will be offered again as a pilot measure in November and December of 2018.

ENS will also engage in a variety of EPI marketing initiatives throughout 2018 utilizing digital and social media platforms, as well as print advertising, direct mail, and features in ENS's *The Switch* Residential newsletter.

First Nations Home Energy Efficiency Pilot

In 2018, ENS will use DSM funds to support a new First Nations Home Energy Efficiency pilot program that is primarily funded by the Province of Nova Scotia. The DSM-funded portion of the pilot will seek to deliver significant electrical energy savings to on-reserve, Band-owned homes, where the household is income-qualified.

Currently, Band-owned homes are not eligible for the HomeWarming service, due to home-ownership requirements. DSM funds will be used to conduct energy assessments and complete energy-efficiency upgrades for approximately 35 electrically heated homes, focusing on building envelope and/or heating system upgrades. The pilot will be offered in all 13 First Nations communities across the Province, with priority being given to the upgrades that result in the most significant energy savings. DSM funds will also be made available for electrical appliance replacements in non-electrically heated homes, similar to the approach taken by the HomeWarming service. ENS expects that most homes participating in the pilot will receive upgrades in 2018, with some being completed in early 2019.

3.1.3 New Residential

In 2018, ENS will continue to work closely with the exiting NHC Service Provider to assist in the completion of the Service Provider's remaining projects. Also, the NHC Passive House pilot will continue, with a number of project completions anticipated in early 2018.

NHC will continue building relationships and further engaging with builders and contractors across the province to increase awareness of and participation in NHC. Marketing activities planned for 2018 include: promotion through a variety of media platforms; attendance at trade-shows and other events; a NHC-specific marketing campaign; and the development of case-studies that profile participants.

3.2 Business, Non-Profit and Institutional Programs and Services

In 2018, the BNI sector will consist of the following programs:

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

In 2018, ENS will continue its efforts to encourage businesses, non-profits, and institutions to incorporate energy-efficient decisions into their activities. The OEM initiative, which helps identify projects for Custom and other BNI offerings, will continue in 2018. As in previous years, this program will seek to recruit new participants in a continued effort to develop energy management plans and facilitate participation in ENS programs.

BNI marketing efforts in 2018 will be aimed towards the following priority participant groups:

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

Marketing efforts spanning the BNI sector in 2018 are focused on non-energy benefits to demonstrate the good things efficiency brings to Nova Scotian businesses and include the following elements:

- integrated marketing campaigns across a variety of media such as print, direct mail, digital and social media, and events and outreach;
- improvements to navigational tools on the ENS website;
- the development and sharing of BNI success stories; and
- education and outreach with key industry associations through partnerships, sponsorships, and event participation.

3.2.1 Efficient Product Rebates

ENS will continue to monitor the impacts of the process improvement initiative that took place for BER in 2017 and will make adjustments as necessary during 2018. In addition, BER rebates will continue to be refined and expanded upon where appropriate. New rebates that will be targeted include expanded lighting and heating options.

Marketing efforts include those listed in section 3.2 above, as well as the hosting of small-business education events along with outreach with the ETN and contractors.

3.2.2 Custom Incentives

The Custom Incentives program comprises the following components:

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

In 2017, Custom Incentives will continue to support innovative projects that do not qualify for other programs.

Custom

Custom comprises three separate services: Retrofit; Building Optimization; and New Construction. ENS will explore opportunities for improvements to these services in 2018, such as reviewing incentive amounts and energy-planning support. ENS will also look at ways to enhance its Service Provider listings. 2018 will also see the continuation of five pilots that began in 2017, detailed further in section 1.3.2.

Marketing will include the strategies noted in section 3.2 above, as well as the development of a technical series to promote energy-efficient trends and new technologies to potential participants.

Energy Management Information Systems

During 2018, ENS will continue to support existing EMIS participants in the expansion of their energy management information systems and will continue efforts to recruit new participants. ENS will also review current participants' operational controls and expand their opportunity for savings through additional controls, identification of new savings opportunities, and refinement of existing actions.

In addition, ENS will investigate the potential to offer a more flexible energy management approach encompassing elements of both EMIS and SEM to facilitate the varying needs of participants. ENS intends to pilot this approach in a limited capacity in 2018.

ENS will undertake work on a further EMIS pilot in 2018, involving the installation of fault detection and diagnosis software designed to further optimize the host facility's operating conditions.

Strategic Energy Management

In 2018, ENS is introducing a flexible approach for SEM participants, in contrast to the cohort model previously used. This change is based on participant feedback and is being implemented to accommodate individual participants' needs and improve accessibility, as well as aiming to increase SEM's participation rates. Participants will enroll in SEM on an individual basis and work one-on-one with the Service Provider, as well as participate in group training events with other SEM participants throughout the year, regardless of their stage in the program component.

3.2.3 Direct Installation

Throughout 2018, the Direct Installation program, marketed as Small Business Energy Solutions (SBES), will continue to provide small businesses in Nova Scotia with access to qualified contractors and to incent small business to complete energy-efficient upgrades in an effort to make them more viable and competitive. The program will also continue to enable participants to find contractors through the ETN or to use a contractor of their choosing. In addition, ENS will add a navigation tool to its website as well as implement additional process improvements to enhance and simplify the participant experience and reduce the cycle time for processing applications.

Throughout the year, SBES will continue to expand support for non-lighting measures, emerging technologies, and vertical market specialties. To encourage greater participation, SBES will place a high priority on contractor and participant outreach in 2018 by attending contractor trade shows and events and providing continued support for the ETN, along with the additional BNI marketing efforts detailed in section 3.2. In addition to this outreach, ENS staff will continue exploring options to educate small businesses on SBES and to promote the offering by facilitating information and education sessions in partnership with key stakeholders.

The SBES Multifamily Housing Pilot will focus on continuing to support existing participants in the implementation of energy-efficient upgrades recommended in the primary audit portion of the pilot.

3.3 Enabling Strategies

Enabling Strategies will remain an important priority at ENS in 2018 and will include the following categories:

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

3.3.1 Education and Outreach

Education and Outreach strategies for 2018 will continue to create awareness and provide information about energy efficiency to stakeholders and Nova Scotians at presentations, speeches, and other events. These activities will include:

- continuing to engage Nova Scotians through social media (Facebook, Twitter, YouTube, LinkedIn, and Instagram) to drive awareness and create a culture of energy efficiency;
- distribution of electronic newsletters;
- advertising via a variety of media to increase awareness and understanding of the programs and services ENS offers, with the objective of increasing participation in them;
- continuing to build the Green Schools program by increasing awareness of, and building energy efficiency into, the P-12 curriculum;
- working with post-secondary institutions to deliver energy efficiency courses;

- attending public speaking engagements and presentations on energy efficiency, as well as attending community events, home shows and trade shows;
- developing and monitoring energy-efficiency media stories; and
- working with delivery agents, industry partners and educational institutions to develop, manage, and deliver education and outreach programs.

3.3.2 Development and Research

Key development and research activities planned for 2018 include:

- tracking quality assurance and participant satisfaction;
- tracking other attitudinal metrics among the general population of Nova Scotia households to help ENS respond to changing market conditions; and
- profiling business segments and exploring the potential to update residential profile segments.

3.3.3 Other Enabling Strategies

In 2018, ENS's Other Enabling Strategies will focus on:

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

PACE Financing

Throughout 2018, ENS will continue to support financing initiatives within its Residential programs. To further these initiatives, ENS will continue to support municipalities participating in PACE, and anticipates exploring and implementing PACE programs in more Nova-Scotian municipalities. Although this initiative occurs outside of ratepayer-funded activities, it enables participation in DSM programs by providing participants with an additional financing option.

Capacity Building

In 2018, ENS intends to procure and train additional Quality Assurance Site Inspectors to collect Delivery Agent performance information pertaining to the residential Efficient Product Installation program component. ENS will also continue to monitor the performance of existing Service Providers by attending site inspections to identify opportunities for continuous improvement and process optimization. In addition, ENS will continue to work collaboratively across programs and departments to schedule site inspections and limit the number of times participants are contacted following program participation.

Throughout 2018, ENS will continue to support and grow the energy-efficiency industry in Nova Scotia and build on the successes of the ETN by:

- continuing the successful theme of ‘The Good Things Efficiency Brings’ at ENS’s annual Bright Business Conference & Awards in 2018, with sessions tailored for ETN members and focusing on the non-energy benefits of energy efficiency;
- coordinating ETN member discounts for training courses, workshops, and conferences offered by industry partners, including the Smart Energy Event, Passive House Canada Certification, and the Certified Energy Manager course from the Canadian Institute for Energy Training (CIET);
- continuing to provide communications to ETN members through ENS’s *The Network News* bi-monthly newsletter;
- providing advance notice of upcoming EfficiencyOne procurement opportunities on the EfficiencyOne website and in ENS’s *The Network News*;
- hosting training and information sessions (e.g. webinars, in-person events, and pre-recorded videos) for ETN members on topics including EfficiencyOne’s Procurement process as well as ENS program offerings and program changes (e.g., incentive changes or application process changes);
- hosting a networking event for ETN members to provide information on how they can work with ENS Business Development Managers to increase uptake in the (Commercial) New Construction service;

- working to increase membership uptake within key sectors and industries, including agriculture, new home construction, and refrigeration technicians; and
- creating marketing guidelines for members and assisting them in accurately referencing ENS services in their business marketing materials.

Working with Governments

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

In 2018, ENS plans to continue supporting the CSA's SRTF and SCOPEER committees. Specifically, ENS intends to support the development of national energy-efficiency standards in the following technology areas:

- retrofit commissioning of commercial and industrial buildings;
- development of a thermal bridging methodology for assistance in code development and enforcement; and
- Variable Capacity Heat Pumps.

ENS will also work with its Evaluation Consultant again in 2018 to establish an appropriate scope for the Codes and Standards evaluation.

Regulatory Affairs

Regulatory Affairs activities will include reporting to the UARB and stakeholders on ENS topics, including:

- the 2019 DSM Resource Plan;
- the development of the 2020-2022 DSM Resource Plan;
- quarterly reports;
- audited financial statements;
- locational DSM efforts, in collaboration with NS Power;

- the 2018 Historical Rate and Bill Impact Analysis;
- quantification of non-energy benefits for cost-effectiveness testing purposes;
and
- addressing evaluation and verification recommendations.

In the first quarter of 2018, ENS consulted with DSM Advisory Group stakeholders to develop the 2019 DSM Plan, which is filed concurrently with this APR. This was developed based on a continuation approach, in accordance with the *Electricity Efficiency and Conservation Restructuring (2014) Act*.

Throughout 2018, ENS will continue to work closely with the DSM Advisory Group and individual stakeholders to discuss these initiatives, as appropriate. Other projects will include working with the Evaluation and Verification Consultants to facilitate their efforts and continuing to support the development of the new DDSM data tracking system.

4 PLANNED AND ACTUAL DSM EXPENDITURES

The October 7, 2015 UARB Order directed NS Power to file its proposed accounting treatment and cost recovery for the 2015 DSM programs and the 2016-2018 programs.³¹ To aid in such cost recovery calculations, ENS will continue to report on planned and actual DSM expenditures by rate class. Table 11, Table 12 and Table 13 present 2015, 2016, and 2017 planned and actual³² DSM expenditures, and Table 14 presents 2018 planned DSM expenditures.

Table 11: 2015 Planned and Actual DSM Expenditures by Rate Class

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

Numbers may not sum due to rounding.

³¹ *Supra* note 1 at p 2, item 8.

³² 2017 expenditures are unaudited.

Table 12: 2016 Planned and Actual DSM Expenditures by Rate Class

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

Numbers may not sum due to rounding.

Table 13: 2017 Planned and Actual DSM Expenditures by Rate Class

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

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

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

1

Table 14: 2018 Planned DSM Expenditures by Rate Class

Rate Code	Planned 2018 Expenditures (\$ million)
Residential/Charitable (2,3,4)	19.4
Small General (10)	1.5
General Demand (11)	8.3
Large General (12)	1.7
Small Industrial (21)	0.7
Medium Industrial (22)	1.0
Large Industrial (23, 25)	1.6
Municipal (24)	0.6
Unmetered (999)	0.2
Total	34.9

2

Numbers may not sum due to rounding.

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

Throughout the 2016-2018 DSM Resource Plan regulatory process, various items arose from or were deferred under the UARB Order,³³ the UARB-approved 2016-2018 DSM Plan Consensus Agreement (Consensus Agreement),³⁴ and the 2016-2018 Quantum Agreement.³⁵ The statuses of the items that remained open in 2017 are discussed below.

5.1 Locational DSM Efforts

In accordance with the UARB's direction in its Order dated October 17, 2015, ENS and NS Power filed a collaborative report on locational DSM efforts (i.e., geotargeting), on 23 December 2016.³⁶ Further to the UARB's letter of January 6, 2017, ENS and NS Power filed a further report on August 14, 2017. In the report, it was noted that while NS Power and ENS could not come to an agreement on the appropriate methodology to assess locational DSM, they would do the following:³⁷

- NS Power would conduct a detailed review of capital expenditures that could potentially be avoided through locational DSM and convey the results to ENS; and

³³ *Supra* note 1.

³⁴ *Ibid* at Schedule B.

³⁵ M06733, NSUARB Decision, *The Public Utilities Act and An Application for Approval of a Supply Agreement for electricity efficiency and conservation activities between EfficiencyOne and Nova Scotia Power Incorporated, the establishment of a final agreement between the parties, and approval of a 2016-2018 Demand Side Management Resource Plan* (12 Aug 2015), 2015 NSUARB 204 at Appendix C; the Quantum Agreement was signed by representatives of EfficiencyOne, the Consumer Advocate, the Small Business Advocate, the Affordable Energy Coalition, and the Ecology Action Centre. Although the Quantum Agreement was not approved by the UARB, the UARB Decision indicated its understanding that "the non-financial provisions of the Quantum Agreement will be pursued by E1, NSPI and other stakeholders through the DSM Advisory Group" (*Ibid* at para 27). As such, ENS is addressing these items alongside the other items that arose from the 2016-2018 Regulatory process.

³⁶ See M06733, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities*, [2016 Locational DSM Report], [23 Dec 2016].

³⁷ See M07815, *The Public Utilities Act, RSNS, 1989, c.380, as amended and An Application pursuant to Subsection 79J(3) of the Public Utilities Act for Approval of the 2016-2018 Supply Agreement for Electricity Efficiency and Conservation Activities* [2017 Locational DSM Report], [14 Aug 2017] at p. 37.

- NS Power and ENS would evaluate the costs and benefits of locational DSM and other types of DSM including those of system-wide peak reduction programs.

The UARB requested an update to be filed by June 30, 2018 regarding these outstanding issues. ENS looks forward to continued collaboration with NS Power on locational DSM efforts.

5.2 Historical Rate and Bill Impact Analysis

In the Consensus Agreement, ENS agreed to develop, in consultation with the DSM Advisory Group, assumptions for its Rate and Bill Impact Analysis (RBIA), and did so prior to filing its 2016 RBIA.³⁸ In response to Stakeholder comments regarding its 2016 RBIA, ENS filed a list of suggested actions for development throughout 2017. Proposed solutions were brought to the DSM Advisory Group meeting on June 28, 2017, and ENS filed its 2017 RBIA with the UARB on October 31, 2017. In response to stakeholder comments, ENS committed to work with NS Power and the DSM Advisory Group throughout 2018 to explore a number of items relating to the methodology and assumptions used in the analysis. As noted in the Consensus Agreement, ENS will file its 2018 RBIA by October 31, 2018.³⁹

5.3 Cost-Effectiveness Testing

In the 2016-2018 Quantum Agreement, the DSMAG agreed to work to achieve consensus as to the methodology and assumptions of the cost- effectiveness screening test to be applied to future DSM Resource Plans.⁴⁰ In ENS's July 22, 2016 Settlement Agreement on the outstanding items from the 2016-2018 DSM Resource Plan regulatory process, stakeholders agreed to "work collaboratively with the DSM Advisory Group to

³⁸ *Supra* note 1 at Schedule B, item 6(a).

³⁹ *Ibid* at Schedule B, item 6(b).

⁴⁰ *Supra* note 35 at s. 7.

1 pursue the nature and quantification of estimates associated with participant non-
2 energy benefits to improve the TRC test in future Applications.”⁴¹

3
4 Further to this Settlement Agreement, ENS hosted a DSM Advisory Group technical
5 symposium in 2016 to discuss the general approach to quantify non-energy benefits
6 within the Nova-Scotian TRC test. ENS then drafted a resulting Scope of Work, which
7 was informed by feedback received from the DSM Advisory Group and circulated for
8 further comment. This revised Scope of Work was provided to the DSM Advisory Group
9 on January 31, 2017 and following that, Vermont Energy Investment Corporation (VEIC)
10 was procured by ENS to undertake a study into measure-level non-energy benefits.

11
12 The purpose of this study is to identify the most comprehensive and defensible non-
13 energy benefit values available in existing research and provide recommendations on
14 adapting them, at the measure level, to ENS’s energy-efficiency portfolio. The draft
15 report was presented to the DSMAG and members’ comments and feedback were taken
16 into account in a revised draft in December 2017. ENS intends to hold further discussions
17 with the DSM Advisory Group in 2018 in relation to ENS’s plans for integrating non-
18 energy benefits into the TRC test in Nova Scotia.

19 20 **5.4 Incentive Setting Methodology Study and Implementation**

21
22 In response to the UARB’s Order dated October 7, 2015,⁴² ENS initiated research to
23 develop a more rigorous approach and methodology for setting incentive levels. This
24 research included gathering information on how 12 North American jurisdictions set,
25 review, and revise incentives for DSM programs as well as reviewing ENS’s current

⁴¹ See M06733, *The Public Utilities Act, RSNS, 1989, c 380 and the order of the Nova Scotia Utility and Review Board in Matter M06733 directing the parties to pursue resolution of certain matters set out in settlement agreements therein within the DSM Advisory Group and The Application of EfficiencyOne for approval of the matters agreed upon within the DSM Advisory Group and for determination of unresolved issues* [Settlement Agreement], [22 July 2016], item 7(a).

⁴² *Supra* note 1.

1 practices and recommending changes to these practices. This study, conducted by
2 CLEAResult, was completed and a report filed with the UARB on June 30, 2016,
3 alongside an Implementation Plan drafted by ENS. Pursuant to the UARB's letter dated
4 November 18, 2016, ENS filed an amended Incentive Setting Methodology report and
5 revised Implementation Plan with the UARB on May 11, 2017, which were subsequently
6 accepted as filed with the UARB on July 18, 2017.

7
8 During 2017, ENS developed a two-year market research plan (2017-2018), in
9 accordance with the Incentive Setting Methodology report. The research initiated in
10 2017 will be completed in early 2018. Findings from this research will be used to further
11 inform the 2018 research conducted by ENS. In accordance with CLEAResult's Incentive
12 Setting Methodology report, ENS also began implementing the new incentive setting
13 methodology. This methodology, which includes screening incentive levels against the
14 thresholds recommended by CLEAResult, now applies to any new measure being added
15 to the ENS portfolio and when incentives to existing measures are being modified. A
16 review of existing incentives is also conducted on a periodic basis, as per CLEAResult's
17 recommendations. The incentive setting and review process uses a Consolidated
18 Calculator, which was developed by ENS further to recommendations from CLEAResult.

19
20 ENS also performed a financial simulation for all measures in 2017, per CLEAResult's
21 recommendation. This simulation examined incentive levels relative to Program
22 Administrator cost-effectiveness test results and incremental costs, among other
23 metrics.

24
25 Finally, the Evaluation Consultant reviewed ENS's progress implementing the incentive
26 setting methodology. This evaluation is filed as part of the 2017 Evaluation Report. ENS
27 intends to use the findings from this evaluation to further refine its processes for setting
28 and reviewing incentives.

1 **5.5 Update on Evaluation and Verification Recommendations**

2

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

6 CONCLUSION

ENS is pleased to submit this Annual Progress Report on its 2017 DSM performance. As of this writing, ENS expects to meet its 2018 planned savings, while continuing to provide DSM programs and services that meet a wide variety of participants' needs. ENS looks forward to the opportunity to respond to questions on this report and to continue updating the UARB and stakeholders on its progress throughout the remainder of the year.

ATTACHMENT 1

EVALUATOR AND VERIFIER RECOMMENDATION UPDATES

Table 1: Update on Implementation of 2013-2015 Evaluation Recommendations

Table 2: Update on Implementation of 2013-2015 Verification Recommendations

Table 3: Update on Implementation of 2016 Evaluation Recommendations

Table 4: Update on Implementation of 2016 Verification Recommendations

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	Continue to work on including as much information as possible in standardized database format: In 2013, more information was available on the DSMDS in the form of automated reports. In order to facilitate savings tracking and future evaluation activities, ENSC should continue to work on including all necessary information in the DSMDS in the form of standardized entries. This includes technical specifications of equipment, answers to pre-screening questions and savings equations.	OV-R6	In Progress	ENS agrees with this recommendation and continued implementing its new Dynamic DSM data tracking system (Dynamic DSM) in 2017. This system will improve customer experience and create efficiencies for program delivery through improved and standardized tracking and reporting processes. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018.	2019
2013	Evaluation	Evaluate the benefits/costs in acquiring a Customer Relations Management (CRM): This type of system could be a key tool for ensuring effective data collection (customer, loyalty, segmentation, benchmarking/competitive, etc.) and evidence-based decision-making.	TPE-R3	In Progress	ENS agrees with this recommendation. The CRM tool is a key component of the Dynamic DSM. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018.	2019
2013	Evaluation	Adapt the tracking system (DSMDS) to the QA program: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2013	Evaluation	Adapt the next tracking system (DSMDS) to the QA program: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Evaluation	Consider adjusting the hours of operation used in the unitary savings calculations for lighting products in the upcoming years: New studies that metered the hours of operation of residential lighting were found during this evaluation, but the Evaluator concluded that the hours of operation coming from the Hydro-Québec study should still be used for this year because of the similar market characteristics that the provinces of Quebec and Nova Scotia have. On the other hand, the Evaluator noted that the Hydro-Québec study only metered the hours of operation of CFLs. Certainly, it can be assumed that the CFLs installed first were installed in sockets that had the longest hours of operation to maximize the investment in more expensive bulbs. Yet, as the market evolves, the incandescent and halogen lamps to be replaced by CFLs or even LEDs will be lamps with lower hours of operation. Consequently, ENSC may have to consider adjusting the hours of operation for their savings calculations in the upcoming years. While a metering study in Nova Scotia would be the most accurate way of estimating operation hours, a more affordable option could be to use the DOE study and potentially adjust the number of sockets per household when using its findings.	MURB-R5	Complete	ENS agrees with this recommendation. The Evaluator completed its Residential Lighting Metering Study in 2017. It is included as an appendix to the 2017 Existing Residential evaluation report.	Complete
2014	Evaluation	Adapt the tracking system (DSMDS) to the QA program: A QA program was implemented in 2013 by ENSC and will become more mature in 2014. This continuous process will involve reviewing a sample of files, particularly targeting projects with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and therefore recommends that the results of these reviews be tracked in the DSMDS.	HEA-R4	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2014	Evaluation	Perform thorough M&V and document it in a complete report for every large project for which thorough M&V work is justified and required. The Evaluator has observed that ENSC is using M&V as a tool increasingly often each year for Custom Retrofit. For some simpler and smaller projects, performing some hours-of-operation data logging and spot measurement may be adequate to allow establishing savings with a fairly good level of accuracy and reliability. However, this year, the Evaluator encountered some very large projects with multiple energy efficiency measures, for which the M&V activities conducted were limited to a few spot measurements. The Evaluator considers that in order to justify incentives amounting to hundreds of thousands of dollars, a complete M&V report should be written to report on all the major elements defined in standard M&V protocols, such as the IPMVP. For smaller projects, a good practice would be to summarize the measurement methodology (what was measured and when) and the equations used to establish energy savings based on the raw data in a short form.	Custom-R1	Complete	ENS agrees with this recommendation. Standardized M&V processes and documentation were implemented as of January 1, 2018. ENS recognizes that more improvements may be required and will continue to monitor and assess for further improvements.	Complete

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Evaluation	Gather more data to conduct a conclusive calibration billing analysis in 2015. Despite the fact that 23 projects were completed in 2012 and 2013, it was only possible to obtain sufficient energy billing data for seven projects to perform a calibration analysis in 2014. This calibration analysis proved to be inconclusive due to numerous factors. The Evaluator consequently suggests that this evaluation activity be continued in future evaluation. Other measures could be taken to ensure the quality of the result, such as requiring a final energy simulation submission (based on the as-built conditions), making enhanced building commissioning a mandatory element of Custom NC and/or including a full energy simulation review to ensure the accuracy of the model inputs.	Custom NC-R1	Deferred	ENS appreciates this recommendation. Peak demand savings are now collected from completed energy models. ENS expects to use Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist ENS in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year
2014	Evaluation	Adapt the next tracking system (DSMDS) to the QA program: A QA program will be fully implemented by ENSC in 2014. This continuous process will involve reviewing a sample of files of HOT2000 simulation results compared with low EnerGuide ratings or high delta EnerGuide. The Evaluator commends ENSC on this action and recommends that these review results be tracked in the DSMDS. However, the Evaluator is aware that this process might take time to be perfectly implemented. In the meantime, ENSC can track the QA results on a separate spreadsheet using an identification number that allows merging the information easily with the tracking system. Moreover, the QA results should include the identification of the CEAs who conducted each assessment to provide more support or training to CEAs with less experience.	PP-R1	Deferred	ENS agrees with this recommendation. After all program components have been implemented in the Dynamic DSM, ENS will consider the cost and scope of work involved in integrating QA activities into the Dynamic DSM.	To be considered in a future year
2015	Evaluation	Continue working towards the standardization of measurement and verification (M&V) procedures for Custom Retrofit. ENS is currently developing tools to improve the quality of the M&V activities carried out for Custom Retrofit. The Evaluator believes that those efforts should be maintained, as the lack of consistency and the at times incomplete documentation of M&V are the main weaknesses of Custom Retrofit. In particular, the M&V strategy should be worked out with the participant and included in the Project Development Agreement (PDA), and all documentation relevant to the calculation of savings should be stored on the demand-side management data system (DSMDS).	Custom-R2	In Progress	ENS agrees with this recommendation. ENS has standardized its M&V policy. Documentation regarding calculation of savings is now stored on the Dynamic DSM. An updated PDA will be launched in 2018 that outlines the planned M&V activities.	2018
2015	Evaluation	Improve the internal review procedure for savings calculations of both BER Mail-in and Instant Rebates. In 2015, the Evaluator applied large adjustment ratios to the three most popular measure categories in BER Mail-in (HVAC, Lighting and LED Promotion), while LED linear fixtures and LED linear lamps were adjusted by over 50% in BER Instant Rebates because of data entry errors. These corrections appeared to be more significant than in previous years. The Evaluator noted that lighting projects in BER Mail-in required an especially higher number of corrections, for a number of reasons: (i) hours of operations were not representative of the facility's schedule; (ii) ballast factors were used inconsistently; and (iii) wattages did not match those on the specification sheets. It is strongly recommended that additional quality control steps be defined and implemented by the program manager to ensure that savings are calculated accurately upon project approval.	BER-R1	Complete	ENS agrees with this recommendation. ENS modified the participant forms/worksheets to collect additional HOU information from participants as requested by the Evaluator. New procedures have been established for baseline wattages in new construction projects and for the BER team to ensure they are including ballast factors as well as using the wattage table. These changes were also updated in the BER CIRx Screening Tool.	Complete

Table 1
Update on Implementation of 2013-2015 Evaluation Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Evaluation	Further improve the tracking system. The Evaluator commends ENS for the significant improvements that have been made to the BER Mail-in and Instant Rebates tracking systems in the last two years. Nevertheless, some potential improvements were identified again this year. In BER Mail-in, it was found that the project's total savings were sometimes not linked to the individual measure savings. The Evaluator also noticed, in a few cases, discrepancies between the calculation algorithms, the variable descriptions and the savings calculated for the same measure. For BER Instant Rebates, the most significant potential improvement would be to update the evaluation category field to match the categories used in the 2015 evaluation.	BER-R2	In Progress	ENS agrees with this recommendation. Once transitioned to the Dynamic DSM, BER calculations will be standardized and consistent. In 2017, ENS fully integrated three program components into the Dynamic DSM and will integrate others in 2018. For BER Instant Rebates, each measure will be attached to a specific measure category that will match the most recent evaluation. ENS also completed additional training of staff to ensure the savings algorithms and variables were applied correctly for BER, performed a second review of completed BER mail-in projects, and updated the evaluation category in the BER tracking sheet for Instant Rebates.	2019

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Verification	Efficiency Nova Scotia should take steps to carefully establish a Nova Scotia TRM. This would facilitate both program planning and evaluation.	Savings Verification Recommendation No. 2	Complete	ENS agrees with this recommendation. ENS has completed the development of an electronic Technical Reference Manual. All measures for all programs have their calculations set up in the software that houses and executes all ENS savings calculations. All program components will be able to use the electronic Technical Reference Manual after they have been fully implemented in the Dynamic DSM.	Complete
2013	Verification	Research Questions. The next process evaluation should begin not at the level of official documents, the expectations of executive management and the mechanics of balanced scorecard and key performance indicators but with a practical and empirical perspective to answer questions, such as: "How and how well does this organization work in actual practice (considering the organization as the ENSC core plus all contractors and trade allies who together create and deliver the programs)? Where does it experience problems? What are the realities, pressures and benefits of work life for staff at different levels? Is there adequate challenge to individuals and is there adequate empowerment in scope of independent decision making and action for staff at all levels to both self-actualize and develop and, at the same time, to conscientious responsibility for service relationships with the people and institutions that ENSC serves? What are the restrictions on scope and to what extent are they needed or unnecessary? How and how well does ENSC maintain good faith and quality of service in the work done in customer homes and in businesses and industrial and institutional facilities? Are there any problems or unintended consequences or side effects in how this work is organized and carried out, and how might they be addressed? What are the informal realities experienced in work in the organization as well as the formal realities? Is the organization a good place to work? What might a new worker to the organization expect and are there career ladder possibilities? Is there also cynical knowledge in the organization and is there an experience of irony in some aspects of work? What do people who have left the organization think about it? Are there cases of underservice as well as good service? Why do cases of underservice occur – are they just products of contingencies or is anything patterned or built-in by organizational processes or requirements. Are there experiences of unanticipated side- effects, and how have programs be adapted to encounter these realities?	Process Evaluation SV-1	Complete	ENS agrees with this recommendation. Its Evaluator developed research questions for each of its process evaluations that focused on assessing how well ENS's processes are working in actual practice. The research questions are identified in each of the 2017 program support process evaluations. ENS plans to continue this approach to developing research questions in future process evaluations.	Complete
2013	Verification	Boundary for Analysis. The next process evaluation should draw the boundary for the study around ENSC plus its service delivery agencies and other extensions.	Process Evaluation SV-2	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. The Evaluator's methodology involved interviews with partners and participants where appropriate. They also reviewed best practices literature and in one case, interviewed other organizations similar to ENS. ENS will ensure all future process evaluations include partners outside the organization where applicable.	Complete

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2013	Verification	Inclusion. Interviews and surveys should be inclusive of all staff levels, delivery agent staff and others who do the work.	Process Evaluation SV-4	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. The Evaluator's methodology involved interviews with ENS staff at all levels of management and interviews with partners and participants where appropriate. ENS will ensure all future process evaluations include interviews/surveys with all relevant groups involved.	Complete
2013	Verification	Confidentiality. Rather than focus groups, group settings or surveys which require personal identification, the evaluator should engage in dialog with individuals and guarantee confidentiality.	Process Evaluation SV-5	Complete	ENS agrees with this recommendation. The Evaluator conducted individual interviews with ENS staff and, in some cases, others outside the organization for its Marketing evaluation and Practices & Procedures evaluation. The Evaluator did not disclose respondent identity and will not disclose this information unless required by law.	Complete
2013	Verification	Readability. The next organizational level process evaluation should be written in a style that would be understandable to any resident of Nova Scotia without special training. In particular the model originally developed by the military for top-down strategic theater-level control of warfare and later transformed by Kaplan and others to nearly universal application to mission oriented businesses and non-profit organizations should be kept in the background since it is only the formal only part of the story. Special language like balanced scorecards and integration of key performance indicators for top down computer assisted reporting and control should be present as a dimension but minimized. The story of the organization and why it works and how it really works and how it provides real value and authentic service relationships should be told in everyday language and in a way that is inherently interesting and understandable.	Process Evaluation SV-6	Complete	ENS agrees with this recommendation and has implemented it in the Marketing evaluation and Practices & Procedures evaluation. ENS will ensure all future process evaluations have better readability for a wider audience.	Complete
2013	Verification	Hours of Use Study. The evaluator and ENSC should conduct a Nova Scotia hours of use study.	MURB SV-1	Complete	ENS agrees with this recommendation. The Evaluator completed its Residential Lighting Metering Study in 2017. It is included as an appendix to the 2017 Existing Residential evaluation report.	Complete
2014	Verification	TRM. Efficiency Nova Scotia should take steps to carefully establish a Nova Scotia TRM. This would facilitate both program planning and evaluation.	Savings Verification Recommendation No. 2	Complete	ENS agrees with this recommendation. ENS has completed the development of an electronic Technical Reference Manual. All measures for all programs have their calculations set up in the software that houses and executes all ENS savings calculations. All program components will be able to use the electronic Technical Reference Manual after they have been fully implemented in the Dynamic DSM.	Complete

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2014	Verification	Develop evaluation guidelines. A separate document from a TRM is a set of evaluation guidelines covering methods, practice and reporting. The New York evaluation guidelines and appendices could be reviewed and modified to form an initial document. This would set certain evaluation standards for future evaluations.	Savings Verification Recommendation No. 3	In Progress	ENS agrees with this recommendation and is developing evaluation guidelines to specify its approach and expectations for future evaluations.	2018
2014	Verification	Savings Weighted Measure Lives. The time dimension should be operationalized in the indicator system to supplement use of first year energy savings as a savings indicator. Programs differ in their time duration in providing kWh savings and demand reduction. Development of physical savings weighted measure lives for programs and program components and initiatives will provide a system for differentiating program efforts on this critical dimension and should be included in future impact evaluations. Keeping the first year energy savings as the sole performance criterion for assessing energy savings and demand reduction impacts makes standalone DSM behavioral programs appear equivalent to primarily technical and technical/regulatory DSM program. This mistake occurs as an artifact of the indicator system.	Savings Verification Recommendation No. 5	Complete	ENS agrees with this recommendation and began reporting lifetime energy savings for all of its program components in 2017. The Evaluator reviewed ENS's methodology through its evaluation work, presenting its results in the 2017 evaluation reports. The Evaluator used a multiple baseline approach where appropriate to determine lifetime energy savings.	Complete
2014	Verification	Calibration for Custom New Construction. Structure project monitoring to gather more data to conduct a conclusive calibration billing analysis in 2015 and develop the diversity factor used in peak demand savings by building it up from an individual measure basis.	Savings Verification Recommendation No. 17	Deferred	ENS appreciates this recommendation. Peak demand savings are now collected from completed energy models. ENS expects to use Portfolio Manager as a tool for storing utility bill data. Currently, Portfolio Manager is not mandatory for NC participants, although most participants are open to using the tool. This will assist ENS in storing utility bill data until enough information is collected to conduct a future calibration billing analysis.	To be considered in a future year
2015	Verification	Savings Weighted Measure Lives. The time and savings dimension should be operationalized in the indicator system to supplement use of first year energy savings as a savings indicator. Programs differ in their time duration in providing kWh savings and demand reduction. Development of physical savings weighted measure lives for programs and program components and initiatives will provide a system for differentiating program efforts on this critical dimension and should be included in future impact evaluations. Keeping the first year energy savings as the sole performance criterion for assessing energy savings and demand reduction impacts makes standalone DSM behavioral programs appear equivalent to primarily technical and technical/regulatory DSM programs. This occurs as an artifact of the indicator system.	SV-2	Complete	ENS agrees with this recommendation and began reporting lifetime energy savings for all of its program components in 2017. The Evaluator reviewed ENS's methodology through its evaluation work and the results are presented in the 2017 evaluation reports. The Evaluator used a multiple baseline approach where appropriate to determine lifetime energy savings.	Complete
2015	Verification	Provide additional or reinforcement health and safety issue training, including mold problems and fiberglass precautions to all HEA field staff.	SV-9 (HEA)	In Progress	ENS agrees with this recommendation. ENS will provide health and safety training with respect to building science and indoor air quality with a focus on moisture and mold to all service organizations at ENS's next in-house group seminar.	2018

Table 2
Update on Implementation of 2013-2015 Verification Recommendations

Year	Evaluation/ Verification	Recommendation Text	Source	Status	Comments	Expected Period of Completion
2015	Verification	For Retail Direct Install, recommendation RDI-R1, include analysis of additional savings impacts and adoption practices for smart power controllers as they are used for gaming consoles.	SV-13 (RDI)	Complete	ENS agrees with this recommendation. ENS received and reviewed the results of the California field study. Findings from the study showed that differentiated savings levels are not reliable, and use of a single savings value for all Tier 2 smart power controllers products is appropriate. Therefore, ENS will continue to use a single savings value for smart power controllers.	Complete
2015	Verification	Maintain and enhance the EMIS savings by adopting SEM program elements with the EMIS technology. For the EMIS program, multi-year evaluated savings increases for this technology can be expected based on continual improvements in facility savings due to increased information and control. Some studies show a continual increase in annual savings for several years. A follow up analysis of second and third-year facility savings, in absence of other program activities, should be performed on these projects and attributed to program savings through the 'milestone' achievements tab for the project. Follow up analysis should also address the level of ongoing support and commitment to SEM at the plant and company level.	SV-20 (EMIS)	In Progress	ENS agrees with this recommendation. The existing EMIS program component requires participants to not only install sub-metering infrastructure, but also to integrate the management of energy into an existing management processes, and draw on a lot of the organizational elements of SEM. EMIS incremental savings are evaluated on an annual basis for participants who continue to participate in the program component over a multi-year period. For SEM, ENS is currently working with a new service provider and will evaluate each participants' requirements for continued support beyond year one. ENS has engaged with past SEM participants, resulting in further interest in the EMIS program.	2018

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Start using the new method for calculating interactive effects associated with lighting projects. In 2016, the Evaluator improved the methodology used by ENS for calculating interactive effects and applied it to Business Energy Rebates, Custom, and Small Business Energy Solutions. It is recommended that this new methodology be applied in 2017.	OV-R1	Complete	ENS agrees with this recommendation and has implemented it for the BER, SBES, and Custom program components.	Complete
Continue to perform metering activity and keep improving its quality and effectiveness. This year, metering activity was focused on the small appliances retired since they were made eligible for the program component for the first time in 2016. However, the number of units metered was too small and the volume of data collected was not enough to support an impact evaluation. Another change made this year was the reintroduction of the “10 years old or older” eligibility criterion, after accepting only appliances of more than 15 years of age in 2015. Consequently, two types of appliances should be particularly targeted for metering in 2017, namely small appliances and full-size appliances with a more recent manufacture year class (in order to include appliances between 10 and 15 years of age). To help ensure that sufficient data is collected for the 2017 evaluation and improve metering data precision level, the Evaluator recommends planning the metering activity as early as possible in 2017. The Evaluator’s visit to the recycling facility and analysis of the raw metering data revealed that the metering process can be improved by: › Using the raw data from the current transformer instead of the single final value from the plug-in meter to calculate energy consumption values. This will allow validating the proper functioning of the metering equipment since consistency in amperage can be verified over time. › Logging refrigerators’ and freezers’ internal temperatures throughout the metering process instead of recording the internal temperatures only at the beginning and the end of the metering period. › Establishing a calibration procedure for the data-logger and the plug-in meter, to be followed before the metering starts.	ARet-R1	Complete	ENS agrees with this recommendation and met all 2017 metering requirements. The metering protocol has been updated to include: using the current transformer results to calculate energy consumption; including continuous internal temperature sensing of appliances; and establishing a calibration protocol for the metering equipment. The revised protocol was reviewed and approved by the Evaluator and the metered data was used in the 2017 Appliance Retirement evaluation.	Complete
Continue monitoring key market indicators to adapt program component offerings when needed. Increasing adoption of LEDs by consumers and changes in retailer offerings were noticed during the 2016 evaluation. The high number of LEDs sold during the 2016 year (either within or without the campaign periods) and the declining retail price of LEDs (see Subsection 6.2) indicate market barriers have been reduced, especially for A-type LEDs. The Evaluator recommends continuing to monitor key market indicators such as the price of LED lamps and number sold, participating number of retailers, customer awareness and experience with LED lamps, as well as their penetration rate in Nova Scotia households. These data should be deeply analyzed in the next evaluation to determine if the significant changes observed in 2016 persist over time and to be able to recognize the point where program interventions, in their current form, will no longer be needed for LED lamps, i.e., the point where market transformation is achieved. Based on the state of the market, different exit strategies that can lead to continuous energy savings even after a program or incentive has ended could be investigated.	Instant-R1	Complete	ENS agrees with this recommendation and completed it in 2017. Interviews with retailers were completed in Q4 independently by both the Evaluator and ENS to collect information on key market indicators. The Evaluator reported on findings in the 2017 Residential Efficient Product Rebates (Instant Savings) evaluation report. ENS piloted several non-lighting products in 2017 in the Instant Savings program component and continues to explore other non-lighting measures for future inclusion.	Complete
Closely monitor the evolution of the refrigerator and clothes washer markets. Effective 28 June 2017, a new Canadian energy efficiency regulation identical to the current American regulation comes into force. This regulation will impact the energy efficiency level of refrigerators and clothes washers. It might also significantly affect the baseline energy consumption and thus, the unitary savings value of appliances sold through Instant Savings. It could also impact product offerings, for instance by increasing the number of models that meet ENERGY STAR guidelines and Consortium for Energy Efficiency (CEE) Tier III standards. The Evaluator recommends that this situation be closely monitored and analyzed in 2017 to confirm whether it is still relevant and cost-effective to offer incentives for refrigerators and clothes washers and, if so, select the right energy performance criteria to ensure a certain level of savings and impact in the market.	Instant-R2	Complete	ENS agrees with this recommendation and has completed it. Instant Savings retailers shared inventory data with ENS that showed that most of the refrigerators and clothes washers available in the Nova Scotian market already met the new federal standards for energy consumption as of mid-2017. ENS therefore adopted the new federal standards as a baseline for refrigerators and clothes washers effective in June, 2017. ENS continues to monitor the market to assess the cost effectiveness of appliance rebates in 2018.	Complete
Assign staff to answer EA questions about HEA. To clear some of the confusion created by the changes HEA has undergone since April 2015, EAs asked for a single ENS contact to answer their questions and inquiries, especially about eligibility requirements. EAs also mentioned the need for additional training for themselves. Facilitating transmission of information to EAs could also have a positive impact on participants who mentioned unclear HEA requirements as a source of dissatisfaction with HEA in 2016.	HEA-R1	Complete	ENS agrees with this recommendation and has assigned two ENS staff to answer EA questions about HEA. ENS has also taken steps to better facilitate the transmission of information to EAs and will continue investigating how best to support additional training for EAs.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Use the unitary savings established as part of the 2016 HEA evaluation to determine the savings generated by the DHW measures. During this evaluation, the Evaluator assessed how best to determine the savings associated with DHW measures recently introduced in HEA, and established unitary savings for each type of DHW system. Unitary savings values were favoured over the simulation results to provide more accuracy and consistency with the savings claimed among the different residential program components. Only a small number of DHW measures (two) were installed by HEA participants in 2016, but since this number is expected to increase, the Evaluator recommends integrating the unitary savings values as the method to claim DHW measure savings in the HEA tracking system.	HEA-R2	Complete	ENS agrees with this recommendation and has integrated the unitary savings values established through the evaluation into the HEA tracking system to accurately capture DHW savings.	Complete
Maintain follow-ups with EAs and continue to conduct project reviews to assess the progression of simulation file quality. As part of the 10 HEA project reviews (on site visits and HOT200 simulation reviews), the Evaluator noted that EAs generally performed well in recording household energy component data, though there were some differences in the quality of the reviewed simulation files. The Evaluator noted opportunities to increase the accuracy of HOT2000 simulations and recommends sharing with EAs those aspects that ENS would like to improve. ENS already conducts follow-ups with EAs and the Evaluator recommends continuing to do so. Project reviews should also be conducted on a regular basis to continue monitoring the quality of simulations and monitor progress. Finally, if the HOT2000 software should ever be modified, or if considerable improvement is made to the quality of simulation files, the overestimation ratio should be reviewed with a new billing analysis to increase accuracy of the savings calculations.	HEA-R3	Complete	ENS agrees with this recommendation and continued to conduct follow-ups with EAs and perform project reviews in 2017. ENS and its partners began using a new version of the HOT2000 modelling software in late 2017, so the Evaluator recommended a billing calibration analysis for the 2018 evaluation.	Complete
Monitor market progress to adapt the program component offer to the evolving market. According to the retailers of biomass measures and heat pumps interviewed as part the 2016 evaluation, the market has changed a lot in the last few years. Changes were noticed in consumer awareness and interest, variety of equipment offered, levels of product quality, and price. Moreover, some of the products rebated were mentioned as very popular among the portion of consumers who are not very price sensitive. The Evaluator recommends conducting general population surveys or market actor consultations to better understand how the market is evolving and to what extent the market has transformed. Depending on the level of market transformation achieved and the barriers still found in the market, the program component offer (eligible products, rebate amounts) and delivery should be adapted. If necessary, eligibility criteria should be revised to ensure products offered through Green Heat are the best in terms of energy efficiency and not currently widely purchased on the market. These data collection activities could also be used to start monitoring market indicators of new products as soon as they are introduced in the market, which would enable both better understanding of program influence at the market level and further study of the market transformation.	GH-R1	Complete	ENS agrees with this recommendation has implemented changes to the eligibility requirements for Cold Climate Mini-split Heat Pumps. The Evaluator conducted additional market evolution research through its evaluation and reported results in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Increase program component advertising to households and collaborate with retailers. Evaluation results showed fairly high free-ridership levels for products rebated through Green Heat, especially for heat pumps and MSHPs. The Evaluator recommends focusing marketing efforts on (1) better communicating with households, and (2) collaborating with retailers. Advertising the program component more effectively to households could contribute to lowering the free-ridership level by reaching out to homeowners who have not yet decided to replace or supplement their equipment with heat pump, solar or biomass units. Indeed, many surveyed participants conceded that they had already made the decision to install a high-efficiency system before learning about Green Heat. For homeowners who have already decided to change their heating system, retailers could encourage them to choose the most efficient product by offering the necessary information to customers. However, both lack of point-of-sale material and retailer training result in retailers poorly understanding Green Heat. The Evaluator suggests increasing program component knowledge among retailers by providing them with an impetus to more actively promote higher efficiency models, and offering point of sale promotional material. ENS could request retailer inputs about which equipment to promote to achieve energy savings that would not occur otherwise.	GH-R2	In Progress	ENS agrees with this recommendation. In 2017, it increased its marketing and outreach to promote the Green Heat program component. In addition to developing in-store posters, rack cards, and handle hangers for distribution among retailers at no cost to them, ENS implemented a fall marketing campaign with digital ads on Facebook, the Weather Network, and local news websites. Based on the results of the 2017 Green Heat evaluation, ENS plans to continue its outreach, particularly to retailers, in 2018.	2018
Consider real baseline conditions in the savings calculation. The review of the tracking sheet and the results of site visits revealed that many participants already owned either an efficient heating system or a secondary heating system that meets a large portion of their heating needs, thereby reducing the energy savings potential of their home. The billing analysis rendered evidence to support this impact, as the pre installation electrical heating load was estimated at only 11,413 kWh (compared to a previous estimate of 14,600 kWh for a completely electrically-heated home). It is therefore recommended that the efficiency of existing electrical systems and the presence of secondary systems be considered when estimating savings, rather than using unitary savings values that are based on a heating load entirely supplied by an electrical resistance heating system.	GH-R3	Complete	ENS agrees with this recommendation and has implemented it.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Perform the MSHP billing analysis again in 2017. The billing analysis conducted as part of the 2016 evaluation resulted in a major change made to the average savings value for MSHPs. Although this analysis yielded conclusive results, the Evaluator believes that it should be conducted again in 2017 for two reasons: (1) to perform the analysis with a larger sample of participants who will provide sufficient billing data; and (2) to take into consideration any major changes that may occur in 2017 as the Green Heat management team makes adjustments to this relatively new measure.	GH-R4	Complete	ENS agrees with this recommendation. The Evaluator conducted a billing analysis as part of the 2017 Green Heat evaluation. The results are presented in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Continue researching more accurate sources to estimate the runtime hours of central heating systems. The Evaluator found new sources from available literature that estimated equivalent full load hours for central heat pumps based on energy modelling. This represents an improvement over the previous estimate which was based on a standard value. However, the Evaluator considers that accuracy could be further improved by accounting for actual conditions under which heating systems operate in ENS participants' homes. For instance, the billing analysis established average energy savings for MSHPs at 4,990 kWh, despite an average installed capacity of 21,509 Btu/h. This suggests that MSHPs generally do not run for as many annual hours as originally estimated, notably because of the presence of other heating systems. Conducting a similar billing analysis or a metering study for central heat pumps would therefore allow factoring in parameters that are representative of equipment installed under Green Heat, such as control strategies and interactions with other heating systems.	GH-R5	Complete	ENS agrees with this recommendation. The Evaluator conducted a central heat pump billing analysis as part of the 2017 Green Heat evaluation. The results are presented in the 2017 Existing Residential (Green Heat) evaluation report.	Complete
Limit the number of smart power controllers installed to two per household. The tracking report indicated that 589 RDI participants each received three or more smart power controllers. The Evaluator believes that the third and the fourth controller installed in one house are unlikely to generate the same amount of savings per unit as a unique controller installed per house, since their respective audiovisual systems may be used only occasionally. Also, of the eight participants visited who had received more than one controller, only one still had all the controllers installed, resulting in an average installation rate of 30 percent for this group of participants. Although these results have been obtained from quite a small sample, the Evaluator still believes that having more than two smart power controllers installed might not be an effective way to maximize RDI's impacts.	RDI-R1	Complete	ENS agrees with this recommendation. After further review in 2017, ENS decided to limit the number of smart power strips to two per household as of January 15, 2018.	Complete
Conduct more on-site visits with participants who received smart power controllers. Based on the information collected from the 44 site visits conducted with participants who had smart power controllers installed in 2016, a fairly low installation rate was observed. These 44 visits conducted did not provide enough data needed for establishing an installation rate within an acceptable margin of error. Since a site visit is considered a much more reliable means to validate the installation of smart power controllers than a telephone survey, it is recommended that additional visits should be conducted in early 2017 so as to determine with confidence whether or not the installation rates have decreased in comparison with the previous years.	RDI-R2	Complete	ENS agrees with this recommendation. The Evaluator increased its number of on-site visits for participants who received smart power controllers in 2017 and was able to establish an installation rate with an acceptable margin of error.	Complete
Start measuring spillover in 2017. Spillover has never been measured for RP&C because it has been assumed that RP&C replaces all the inefficient products that could be upgraded by tenants. However, as the lighting market evolves, the Evaluator has observed some spillover in RDI, another direct-install program component. For instance, compact fluorescent lamps are being replaced by LED lamps, and mini-split heat pumps are being installed. Similarly, although most RP&C participants are renters and are presumably less likely to invest in upgrading their homes, they are nonetheless still likely to start installing some of these measures without receiving any incentive encouraging them to do so. Therefore, the Evaluator recommends starting to measure spillover for RP&C in 2017.	RP&C-R1	Complete	ENS agrees with this recommendation. RP&C and RDI merged and rebranded as Efficient Product Installation (EPI) on January 1, 2017. ENS tracked spillover for all 2017 participants in this program component using the 2016 evaluation values.	Complete
Continue conducting project reviews to assess the evolution of the quality of simulation files. As part of the 10 NHC project reviews (on-site visits and HOT200 simulation reviews), the Evaluator noted that EAs generally performed well in recording household energy component data, though there were some differences in quality of the simulation files reviewed. The Evaluator is aware that training was provided to EAs in 2016 and therefore recommends conducting project reviews on a regular basis to keep monitoring simulation quality and monitor progress over time. The Evaluator noted some recurrent mistakes in the HOT2000 simulations (see Subsection 5.1) and will follow up on these aspects during the 2017 evaluation. In the meantime, the Evaluator recommends sharing with EAs those aspects of the project review process that ENS would like to improve.	NHC-R1	Complete	ENS agrees with this recommendation and continues to conduct project reviews. Additionally, ENS worked with Service Organizations to ensure simulation files were of high quality through the transition to the new EnerGuide Rating System by providing a specialized training file and a workshop for all EAs.	Complete

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Ensure that all required documentation is included in participant files. Though EAs generally performed well in recording household energy component data, the Evaluator could not validate some of the information entered in the simulation files because some required documentation was missing for eight of the 10 projects reviewed, such as specification sheets and drawings. According to NRCan, all documentation required to perform a quality assessment should be provided. Specification sheets should at least be provided for heat pumps and heat exchangers. All participant files should include sufficient details about the building envelope either using a detailed final design evaluation report, or the necessary section views and component drawings to indicate all material layers, insulation levels and thickness contained in wall and ceiling components.	NHC-R2	Complete	ENS agrees with this recommendation and has implemented it. ENS will continue to monitor EA documentation via QA activities.	Complete
Continue improving the BER Mail-in internal review procedure for savings calculations. In 2016, the Evaluator applied large adjustment ratios to five measure categories in BER Mail-in. The lighting measure category required the most adjustments for a number of reasons: (1) hours of use (HOU) were not representative of facility schedule; (2) ballast factors were used inconsistently; and (3) baseline wattages were sometimes inadequate. The Evaluator encourages ENS to implement measures to specifically address these issues, such as modifying the application form to gather more detailed information on HOU, adding a verification step specific to the inclusion of the ballast consumption for baseline wattages and using the efficient fixture specification sheet to establish the baseline for new construction applications.	BER-R1	Complete	ENS agrees with this recommendation and has completed it. First, it modified both the BER and SBES program components' participant forms/worksheets to collect additional HOU information from participants. The launch of the new forms/worksheets was coupled with three information sessions for Efficiency Trade Network members and contractors. Second, ENS updated its CIRx tool to enable consistent use of ballast factors. Third, new procedures have been established for baseline wattages in BER new construction projects.	Complete
Implement complete measurement and verification (M&V) procedures for Mail-in projects generating large energy savings. The Evaluator has observed that large projects are increasingly part of BER's Mail-in project portfolio. For simpler and smaller projects, relying on documentation provided by the participant and performing simple validations may be adequate to establish savings with a fairly good level of accuracy and reliability. For large projects, the Evaluator recommends that a thorough and systematic M&V protocol be implemented, which should include on-site validation, verification of technical documentation and, where warranted, measurement of key parameters. ENS is currently developing such M&V procedures for Retrofit projects. The same procedures should be applied to BER projects generating 300,000 kWh and more to limit the corrections needed to the tracked energy savings.	BER-R2	Complete	ENS agrees with this recommendation and has established a BER M&V protocol which includes metering and data logging for projects over one GWh. The protocol has been developed and will be implemented in 2018. During 2018, BER will continue to develop specific verification and validation processes for specific technologies.	Complete
Conduct deeper market analysis to adapt the BER Instant Rebates offer when needed. Strong market evolution was noticed for 2016. The high number of LEDs sold during the 2016 year, their declining retail price and the increase of free-ridership levels for these products indicate that market barriers have been reduced. Moreover, LED linear fixtures are more often included in the plans and specifications of large new construction projects. The Evaluator therefore recommends conducting deeper market analysis in the next evaluation to determine if the significant changes observed in 2016 persist over time and to recognize the point at which some product categories should be removed from the Instant Rebates service due to a high level of market transformation. To obtain insights and data from the BNI market, which is a challenging task, the Evaluator recommends multiplying data sources as much as possible. For example, interviews with contractors might be performed to confirm the input obtained from interviews with distributors. Sales data of non-efficient lighting products, if available, might also allow comparing the sales level of products rebated through Instant Rebates.	BER-R3	Complete	ENS agrees with this recommendation. As part of the 2017 evaluation, the Evaluator conducted additional activities to gather data on key market indicators in the LED market. The results are reported in the 2017 Efficient Product Rebates (BER) evaluation report.	Complete
Update the values used in the BER Mail-in and Instant Rebates calculations to match the 2016 evaluation results. The Evaluator updated a number of values as part of the 2016 evaluation. The methodology for calculating interactive effects was revised, as were the operating hours of heat pumps (equivalent full load hours). It is recommended that ENS update these values in their tracking system for 2017.	BER-R4	Complete	ENS agrees with this recommendation and has implemented it. The new assumptions and baseline values have been updated in the CIRx tool, and were applied to all applicable 2017 projects.	Complete
Develop tools to help service providers better promote and deliver Building Optimization. Service providers interviewed noted that participants tend to misunderstand the scale and scope of the Building Optimization participation process and the outcomes to be expected. Therefore, the Evaluator recommends developing marketing materials, such as case studies illustrating the typical activities and outcomes associated with Building Optimization, to assist the service providers in recruiting potential participants. It is expected that having more organizations better informed about Building Optimization's process and benefits will help drive participation levels higher.	Custom-R1	Complete	ENS agrees with this recommendation and has developed a brief overview of the Building Optimization service for service providers. When asked about other marketing needs, service providers reported that they are satisfied with the new material.	Complete

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Identify the root causes of New Construction's low participation. Although the ongoing slowdown in Nova Scotia's construction industry is beyond ENS's control, the Evaluator still considers it necessary to properly examine and analyze the causes leading to New Construction's low participation level. Since only two participants were interviewed for this evaluation, the Evaluator cannot provide insightful conclusions about the barriers encountered by participants. Interviewing a larger group of participants and, even more importantly, non-participants could provide useful information and insights on how to make New Construction more attractive to more potential participants. These interviews could be conducted as part of the 2017 evaluation.	Custom-R2	Deferred	ENS agrees with this recommendation and relaunched the New Construction service in Q2 of 2017. ENS will continue to monitor feedback from consultants and participants, and adjust the updated service as necessary. If participation remains low through 2018, ENS and its Evaluator will consider additional evaluation activities to investigate further.	To be considered in a future year
Start using the new method for calculating interactive effects associated with Retrofit lighting projects. In 2016, the Evaluator improved the methodology used by ENS for calculating interactive effects in Retrofit and applied it to all commercial program components. It is recommended that this new methodology be applied in 2017.	Custom-R3	Complete	ENS agrees with this recommendation. ENS has implemented this for all Retrofit lighting projects in 2017 and will continue using the new method in 2018.	Complete
Ensure that a systematic review of Retrofit's peak demand savings calculations is performed. This year, the adjustment ratio established for Retrofit projects' peak demand savings was high mainly because the consultants failed to account for the peak demand savings in their calculations, or ENS took too much caution in tracking savings for those projects that were not simple load reductions, such as lighting replacements. In order to better estimate peak demand savings, the Evaluator suggests that ENS require (1) that the consultants include peak demand savings calculations as a mandatory element in their submission packages, and (2) that all projects without peak demand savings be validated through an internal review process.	Custom-R4	Complete	ENS agrees with this recommendation and worked to build internal awareness and expertise estimating demand savings throughout 2017.	Complete
Implement a standardized process for validating M&V results and savings for Retrofit projects. Two main types of errors were detected and corrected as part of this evaluation: (1) incorrect assumptions for the operating conditions; and (2) necessary variables omitted from the savings calculations, such as correction factors for tri-phased current and interactive effects. A more significant error was found for one project where the equipment installed was not the same as that assumed in the savings calculations. To improve savings estimation accuracy, ENS should improve its M&V procedures by developing M&V summaries and standardized tools, which would help ensure that all key variables are systematically validated at the time of project close-out.	Custom-R5	Complete	ENS agrees with this recommendation and has developed a project summary tool, which includes a site visit checklist and M&V guidance. This tool will be used for all 2018 projects and is included with project documentation.	Complete
Include an estimate of peak demand savings in the M&V plans for Building Optimization projects. By reviewing a sample of three projects, the Evaluator found that peak demand savings should have been tracked for two of them. ENS should require that all M&V plans include either an estimate of peak demand savings or a summary of the energy conservation measures with the potential to reduce peak demand.	Custom-R6	Complete	ENS agrees with this recommendation. ENS requests that all service providers develop demand savings calculations, which ENS reviews.	Complete
Continue to support EMIS and identify potential new participants. Participants value the support they receive from their service provider and ENS. Overall, they are highly satisfied with EMIS although for different reasons. Some appreciated the energy savings, while others appreciated the additional information the system provided. Additionally, EMIS 2016 demonstrated potential for additional savings beyond the first year of participation. For these reasons, the Evaluator concludes that EMIS is successful and should be continued and expanded.	EMIS-R1	Complete	ENS agrees with this recommendation. ENS's Business Development Managers and program staff continue to work with prospective participants to enroll them in the EMIS program component. ENS anticipates seeing the impact of 2017 recruitment efforts in 2018.	Complete
Continue encouraging EMIS participants to enroll in SEM and strengthen integration between the two program components. There is a natural connection between EMIS and SEM. SEM aims to change the culture of an organization in terms of how the organization views and manages energy. EMIS provides infrastructure and technical support to identify operational and process savings. Many organizations participating in one program component would benefit from the services offered by the other. It is also believed that participation in both EMIS and SEM would increase participant internal energy management capabilities and commitment, thereby helping achieve deeper and more sustainable savings.	EMIS-R2	Complete	ENS agrees with this recommendation and continues to encourage cross-participation in EMIS and SEM. ENS has identified one past EMIS participant who has expressed interest in SEM for 2018 and is working with them to meet their needs.	Complete

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Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of EMIS activities. When participants continued taking part in EMIS for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to EMIS, this methodology might be refined to capture all incremental savings.	EMIS-R3	In Progress	ENS agrees with this recommendation and took steps in 2017 to build the required internal resources to create a new baseline for continuing participants. ENS and its service provider re-baselined savings models for three EMIS models and the Evaluator re-baselined the fourth EMIS model. ENS will continue building its capacity for re-baselining models in 2018 to track incremental savings.	2018
Investigate ways of using energy management information systems to their full potential. The Evaluator noted that some participants who had been part of the 2015 impact evaluation had not implemented new energy conservation measures in 2016. While sustaining the savings achieved in previous years is a success in itself, the Evaluator believes that this indicates a potential for even greater savings with minimal additional investment by ENS. Since energy management information systems offer such a wealth of information to participants, the program component should ensure that they are used for continuous improvement and generate as much savings as possible. The program component could include additional support to participants or some form of performance incentive for service providers to identify potential new measures after easy, low-cost measures have been implemented.	EMIS-R4	Complete	ENS agrees with this recommendation and has taken measures to increase incremental energy savings with existing participants. ENS currently has agreements with two existing EMIS participants, which aim to achieve additional energy savings above the incremental energy savings attained the previous year.	Complete
Track major changes to facility operations and equipment and adjust energy baseline consumption as required. The Evaluator identified one project for which the compressed air system had been replaced as part of a Custom Retrofit project in 2016. This modified the baseline energy consumption of the plant and resulted in double-counting savings. The Evaluator made this adjustment, but did not have sufficient data to update the baseline regression; new data should be gathered to update this baseline energy regression in 2017. To avoid this in the future, systematic reviews of facility operational and equipment changes should be implemented by ENS to ensure the accuracy of reported savings.	EMIS-R5	In Progress	ENS agrees with this recommendation and continues to discuss data requirements with the Evaluator and integrate new participant reporting requirements into the program component.	2019
Continue to support SEM and identify potential new participants. Participants value the support they receive from their service provider and ENS. Also, SEM participants generated high energy savings in their first year of participation. The success of SEM could be expanded if the program component were able to identify more potential participants.	SEM-R1	In Progress	ENS agrees with this recommendation. Two new participants enrolled in SEM in late 2017, and a third participant enrolled in March 2018. Program staff and the Business Development team are actively recruiting additional 2018 participants.	2018
Continue encouraging SEM participants to enroll in EMIS and strengthen integration between the two program components. There is a natural connection between EMIS and SEM. SEM aims to change the culture of an organization in terms of how they view and manage energy. EMIS provides infrastructure and technical support to identify operational and process savings. Many organizations participating in one program component would benefit from the services offered by the other. It is also believed that participation in both EMIS and SEM would increase participant internal energy management capabilities and commitment, thereby helping achieve deeper and more sustainable savings.	SEM-R2	In Progress	ENS agrees with this recommendation and worked with past SEM participants in 2017 to complete EMIS assessments. ENS anticipates that at least one of these participants will move forward with EMIS in 2018.	2018
Consider extending the SEM cycle to engage participants for a longer period of time. The service provider suggested having longer periods of participation in SEM, and participant feedback suggests that having participants engage with the service provider for a longer period of time may yield additional savings and help further institutionalize energy management in the culture of participating firms. This has been common in other SEM programs in North America.	SEM-R3	Deferred	At this time, ENS does not have all of the information it needs to perform a full analysis of the cost-effectiveness of extending the SEM cycle. ENS will consider implementing this recommendation in a future year.	To be considered in a future year

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Track incremental savings rather than cumulative savings. For continuing participants in 2016, the Evaluator modified the methodology used to establish savings so that they correspond to incremental first-year savings. Indeed, savings were tracked with respect to a baseline period that spanned approximately one year prior to the beginning of SEM activities. When participants continued taking part in SEM for a second year, their tracked savings were the result of the sum of actions taken since the beginning of their participation and not only the additional actions taken since 2015. This was considered standard industry practice. Since ENS established all of its program component savings targets as incremental savings, the evaluated savings were modified to correspond to that definition. Energy savings that persist year over year only as a result of on-going support or intervention from ENS could also be classified as incremental savings and are not captured under the methodology used in this evaluation because no data on the rate at which savings would decrease in the absence of on-going support is available in the technical literature. As new research is conducted on the impact evaluation of programs similar to SEM, this methodology might be refined to capture all incremental savings.	SEM-R4	In Progress	ENS agrees with this recommendation. There were no 2017 SEM savings but ENS and the SEM service provider are prepared to track incremental energy savings for each participant in 2018.	2018
Improve the identification of event types in the Event Log. The Event Log is a valuable tool for conducting the SEM impact evaluation and it generally contains more information this year than in 2015. However, the Evaluator found that the event categories suggested in the document were not specific enough; for instance, there should be different categories for elements impacting the baseline and the energy efficiency measures implemented, rather than categorizing them all as operational changes.	SEM-R5	In Progress	ENS agrees with this recommendation. ENS has created a new event log template for SEM participants. The new event log will provide a greater level of detail on the actions implemented in a facility and will improve the accuracy of savings calculations.	2018
Identify energy efficiency measures installed under ENS instant rebate programs. During the project review, the Evaluator identified several projects for which products were most likely bought with a point-of-sale rebate, but could not find evidence to confirm this. To avoid counting savings twice, it is suggested that SEM participants be asked to provide invoices of energy efficient products bought under ENS instant rebate programs.	SEM-R6	In Progress	ENS agrees with this recommendation. Program staff and the SEM service provider will work with participants to track energy efficiency measures bought with a point-of-sale rebate and ensure that any associated savings are deducted from SEM savings.	2018
Apply the adjustments made to the baseline energy regression in the 2016 evaluation to continuing participants. Two of the three continuing projects from 2015 had their baseline energy regression adjusted under the 2015 impact evaluation. These adjustments were still valid for the 2016 evaluation, but were not carried out by the service provider. Therefore, the Evaluator recommends that the project-specific adjustments made in this evaluation be applied to continuing projects going forward.	SEM-R7	In Progress	ENS agrees with this recommendation. There were no continuing SEM participants in 2017, but ENS is prepared to adjust the baseline for any participants that take part in SEM for more than one year.	2018

Table 3
Update on Implementation of 2016 Evaluation Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
Assist participants throughout the participation process, from enrollment to completion, to minimize the number of participants who do not complete projects and encourage equipment installation. Participants receiving no assistance from contractors throughout the participation process face considerable barriers to implementing projects, including making decisions without technical assistance and spending time seeking bids. Without the assistance of contractors, participants do not make their project a priority, thus leading to potential delays in or failure to complete projects. Any actions ENS can take to connect contractors with participants and remind them that the program component offer is still available should yield more implemented projects. Some examples illustrating how other program administrators have taken meaningful actions to support participants include: randomly assigning contractors to participants; adding general contractors to their trade networks to ensure participants have access to contractors that can manage entire projects; and having the audit report specify a list of contractors who can address each identified measure.	SBES-R1	Complete	ENS agrees with this recommendation and has made several improvements to its Opportunities Report (given to participants after an audit) to enhance the participant experience and encourage project completion. Examples of improvements include: extra information about financing, simple payback times alongside the list of opportunities, and a link to the Efficiency Trade Network to help participants find the contractors they need. ENS has also begun following up directly with participants as projects near their expiry date.	Complete
Engage, support, and provide resources to help contractors promote SBES among potential participants. The highest implementation rates have been so far achieved by contractor-assisted DIY projects. All efforts made by ENS to develop and strengthen its relationships with contractors can potentially stimulate more occurrences of contractor-assisted DIY projects and enable completing more projects. Some examples illustrating how other program administrators have taken meaningful actions to support contractors include: providing preprinted marketing materials; offering cooperative marketing support; offering sales training to contractors; offering a program-specific training session once a year; and conducting outreach to contractors about the program using mailings, phone calls, or by hosting contractor breakfasts throughout the province.	SBES-R2	Complete	ENS agrees with this recommendation and provided support to its SBES contractors throughout the year. In 2017, ENS took extra measures to help contractors understand the program component, offer high quality service, and promote SBES. 2017 contractor engagement activities included: (1) conducting on-site walkthroughs to discuss data collection requirements; (2) assisting contractors with DesignLights Consortium navigation; (3) sending detailed outlines that describe SBES steps in project completion; (4) hosting in-house meetings to discuss the SBES process; (5) offering marketing material to contractors to leave behind at businesses and promote ENS programs.	Complete
Consider working with auditors to make the process of developing cost estimates less burdensome for auditors, contractors, and distributors. Currently, the audit path requires auditors to obtain new cost estimates for each project. Auditors call distributors and contractors who then voluntarily provide bids for the identified measures of a project. These contractors and distributors are unlikely to obtain the project simply because the auditor contacted them, partly because the auditor cannot recommend these contractors to participants. To address this issue, ENS could meet with auditors to discuss alternative methods for estimating costs.	SBES-R3	In Progress	ENS agrees with this recommendation and is gathering price estimates for lighting and other common non-lighting measures. Once this information is gathered and summarized, ENS will share it with auditors.	2018
Improve the application forms and the internal review procedure to ensure the accuracy of savings calculations for DIY projects. The Evaluator found that the variables used in the savings calculation algorithm were often not representative of the actual equipment and operating conditions observed on site. The hours of use for lighting measures were the variables that required an adjustment most often, and those adjustments were generally significant. The Evaluator believes that requesting more information in the application forms would at least partially address this issue; operation schedules should be provided for each measure in each area of the facility. The Evaluator found multiple cases where the hours of use entered in the tracking sheet were the same for all the measures, while the real hours of use varied throughout the facility. Special attention should also be paid to validating the quantities of fixtures and lamps installed; currently, most invoices do not include sufficient information needed for validating the quantities claimed for each project.	SBES-R4	Complete	ENS agrees with this recommendation and developed new participant worksheets that capture more detailed information about hours of use and the location of lighting measures.	Complete
Identify those SBEAs who are qualified to conduct audits at industrial facilities. The on-site visits conducted during energy audits showed that SBEAs possess varying skill levels. While all SBEAs conducted the audit in a professional manner, one SBEA mentioned that he did not have the technical background needed for evaluating energy-saving opportunities at an industrial facility. Industrial facilities require specific technical knowledge. Therefore, ENS may want to identify those SBEAs who are qualified for making industrial facility assessments and assign them to industrial-sector participants.	SBES-R5	Complete	ENS agrees with this recommendation. With the execution of new SBEA contracts in 2017, ENS began offering three tiers of energy audits to small businesses, which are categorized by common measure and building type. Each audit tier requires different qualifications, with the highest level of qualifications needed for manufacturing and industrial audits.	Complete
Focus the 2017 evaluation on the same standards as evaluated in 2016. While the new standards set forth in Amendment 13 will come into force at the end of June 2017, their impact may be limited until January 2018, since retailers need a few months to sell their existing stocks. The Evaluator recommends keeping the 2017 evaluation's focus on evaluating the impact of the same standards evaluated in 2016, while starting to collaborate with NRCan and the industry associations to collect market data on the new products affected by Amendment 13. Past evaluations showed that collecting historical market data from regulatory organizations and industry associations is an indispensable source of information needed for the effective assessment of the provincial market size following the implementation of new standards. The next impact evaluation should start identifying how market data regarding the new targeted products can be obtained; contacts should be made with major stakeholders to collect data about the market evolution that took place over the last five to 10 years.	CS-R1	Complete	ENS's Evaluator included some Amendment 13 product types in the 2017 Codes & Standards evaluation. Both ENS and its Evaluator agree with the rationale behind this recommendation, however, based on preliminary investigation, the market-lag typically associated with the introduction of new product regulations was largely absent with respect to certain Amendment 13 products. Therefore, additional products were added to the 2017 Codes & Standards evaluation.	Complete

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
The Savings Verification study recommends acceptance of the 2016 evaluation results for energy savings and for demand-reduction for all programs.	Recommendation General-SV-1	N/A	No action required.	N/A
In future years, ENS should require the Evaluator to include a copy of the operative evaluation plan within the overall Executive Summary, supplemented by a discussion of why, on balance, selected dropping of evaluation components or introduction of reduced rigor is considered appropriate. In addition, in the individual program write-ups, dropped and reduced evaluation components should be noted and the rationale for dropping or reducing these evaluation components should be explained.	Recommendation General-SV-2	Complete	ENS agrees with this recommendation. In the 2017 DSM Programs Evaluation Executive Summary, the Evaluator described the types of evaluations each component underwent in both 2016 and 2017 (process, market, impact). The Evaluator identified which components saw reduced activities in 2017 compared to the 2016 evaluation and described the rationale for these changes. For further clarity, where reduced evaluation activities took place, the Evaluator described the differences between its 2016 and 2017 approach in the Methodology section of the corresponding program component report.	Complete
In future years, ENS should require the Evaluator to provide a summary table of obtained confidence and precision levels along with population and sample size for all calculations for which confidence and precision levels were developed. Also, the Evaluator should state the overall targets for confidence and precision for the evaluations, and provide a discussion of results in the table. Any variation in the targets and any results that do not meet the targets should be explained.	Recommendation General-SV-3	Complete	In each evaluation report's Methodology section, the Evaluator identified the types of margins of error calculated, and target margins of error and confidence levels. When presenting results with margins of error, the Evaluator included margin of error values in tables alongside other relevant figures such as population and sample size. To further clarify how the Evaluator calculated the five defined margins of error, the Evaluator presented example calculations in Appendix II of the 2017 DSM Programs Evaluation Executive Summary.	Complete
In future years, ENS should specify rules to bound the dropping of evaluation components and to bound the reduction of program impact evaluations. There should be a systematic understanding and articulation of risks to evaluations producing usable and defensible knowledge. For example, a rule could be that impact evaluation for a program will be reduced no more frequently than every other year. Or that process evaluations will skip more than two years in a row. It is quite possible to do some trade-offs to conserve dollars, with the approval of the Advisory Group. But these kinds of trade-offs need to be carefully watched and rules set up to protect the continuing validity and precision of evaluation results.	Recommendation General-SV-4	In Progress	ENS agrees with this recommendation. ENS has now completed its first full year of condensed evaluations and expects to refine its approach to reducing evaluation activities based on this experience. It is working with the Evaluator to develop a set of guidelines to ensure consistent and transparent evaluation planning and expects to finalize guidelines in 2018 that take into account lessons learned during the 2017 evaluation process.	2018
ENS should increase on-site inspection for quality control for all programs that shift from ENS control to reliance on markets.	Recommendation General-SV-5	Complete	ENS agrees with this recommendation. The only program to which this recommendation would currently apply is Small Business Energy Solutions (SBES). SBES completed site visits on approximately 23% of all 2017 SBES projects. This was an increase from 10% in 2016.	Complete
In addition to reporting first-year impacts, ENS and the Advisory Group should consider the benefits and cost of also providing savings estimates based on expected lifetimes to support comparisons among programs and to improve foresight.	Consideration General-SV-1	Complete	ENS agrees with this consideration. The Evaluator included lifetime savings in each of its 2017 evaluation reports.	Complete
For program types that permit, ENS and the Advisory Group should consider the potential benefits and costs of introducing selected persistence evaluations to empirically document lifetimes and persistence of savings.	Consideration General-SV-2	Not Recommended for Action	ENS appreciates this consideration but does not recommend pursuing it at this time. The Evaluator reviewed Effective Useful Lives (EULs) and lifetime savings for the first time in 2017. ENS and the Evaluator plan to continue refinement of the current savings persistence methodology.	N/A

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
ENS and the Advisory Group should consider the potential benefits and costs involved to employ a market transformation framework. This would apply to a limited subset of programs/measures (see specific program recommendations).	Consideration General-SV-3	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. ENS will continue monitoring key market indicators for key product types moving forward.	Complete
ENS and the Advisory Group should consider the potential benefits and costs involved in requiring the Evaluator to report non-utility benefits for climate mitigation.	Consideration General-SV-4	Complete	ENS agrees with this consideration. ENS's Evaluator included avoided greenhouse gas emissions from ENS's DSM work in its 2017 evaluation reports.	Complete
ENS and the Advisory Group should consider initiating discussion with the province and climate adaptation advocates of the intersection between DSM and climate adaptation, particularly in new construction.	Consideration General-SV-5	Not Recommended for Action	ENS appreciates this consideration. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
For A-type LEDs, the 2017 Instant Savings Program Evaluation ENS should consider the costs and benefits of using a market transformation paradigm rather than a resource acquisition approach (including study of market effects). This would include development of the S-curve for the A-type LEDs and fully discuss market transformation program implications. The evaluation would also discuss monitoring A-type LEDs in future years to confirm the stability of a transformed market, and the attribution of subsequent market impacts.	Instant-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator included a technology diffusion illustration (includes an S curve) in the Residential Efficient Product Rebates (Instant Savings) evaluation report to visually represent their findings on the status of the market. ENS will continue monitoring key market indicators for LEDs moving forward.	Complete
In the 2017 evaluation for the Green Heat high efficiency mini-split heat pump measure, ENS should consider the benefits and costs of structuring the evaluation as a market transformation evaluation. Continuing treatment as a resource acquisition evaluation with an expanded market evaluation is stretching against the boundaries of that type of evaluation approach.	Green Heat-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator did not have the data required to identify precise MSHP market adoption on the theoretical curve of technology diffusion but the Market Evolution section provides valuable insights that will help ENS keep its programs relevant and effective in the residential MSHP market. ENS will continue monitoring key market indicators for MSHPs moving forward.	Complete

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
ENS should consider meeting with the appropriate provincial agency and environmental advocates to discuss the evolving intersection of DSM with climate adaptation, particularly for new construction and major renovation projects such as Net Zero and Passivhaus projects.	New Home Construction-SV-R1	Not Recommended for Action	ENS appreciates this recommendation. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
ENS should consider the benefits and costs of structuring the 2017 evaluation for the LED measures for Business Energy Rebates as a market transformation evaluation rather than as a resource acquisition evaluation with a market evaluation.	Business Energy Rebates-SV-R1	Complete	ENS appreciates this consideration and discussed it with the Verification Consultant, Evaluator, and DSMAG in the fall of 2017. In accordance with discussions with the above-referenced parties, for the 2017 evaluations, the Evaluator integrated additional analyses of market indicators for the three program components referenced by the Verification Consultant: Instant Savings, Green Heat and Business Energy Rebates. These analyses are in sections titled "Market Evolution" and describe the state of the relevant market. The Evaluator included a technology diffusion illustration (includes an S curve) in the Efficient Product Rebate (BER) evaluation report to visually represent their findings on the status of the market. ENS will continue monitoring key market indicators for LEDs moving forward.	Complete
ENS should consider meeting with the appropriate provincial agency and with climate adaptation advocates to explore the evolving overlap of DSM and climate adaptation and to develop a list of climate adaptation criteria for new construction and major renovation projects.	Custom-SV-R1	Not Recommended for Action	ENS appreciates this recommendation. At this time, however, it is EfficiencyOne's understanding that addressing climate adaptation is beyond the scope of the UARB-approved Supply Agreement for the provision of energy efficiency and conservation services between NSPI and EfficiencyOne. Upon being given direction from the UARB, ENS would take further steps toward initiating discussions on DSM and climate adaptation with the appropriate authorities.	N/A
We agree with the Service Provider recommendation of greater coordination between the EMIS and SEM program. Further, we recommend that ENS consider merging the two programs into a single customer offer. While there are unique attributes of each that would need to be considered when combining SEM and EMIS, other utilities offer a single program for both.	EMIS-SV-1	In Progress	ENS agrees with this recommendation and continues to encourage cross-participation in EMIS and SEM. ENS has identified past EMIS and SEM participants who have expressed interest in the other program component for 2018. ENS is working with these participants to meet their needs. ENS continues to explore the option of merging the two offerings.	2018
Add the following EMIS related terms to the Definitions (p. iii): Baseline regression, Projected baseline, Adjusted baseline, Cumulative EMIS/EMIS savings, Incremental EMIS/EMIS savings. The EMIS/EMIS definitions for cumulative and incremental savings should reference the relationship between reported energy usage and the projected baseline.	EMIS-SV-R2	Complete	ENS agrees with this recommendation. The Evaluator clearly defined all relevant terms in the 2017 Custom Incentives (EMIS) evaluation report. Please note that in some cases, the Evaluator's terms are slightly different from those listed in the Verification Consultant's Recommendation EMIS-SV-2.	Complete
One way to more clearly communicate the approach is to show the results for each step and each project. Having a table with columns for 2016 Projected baseline, Adjustments, Adjusted baseline, Actual energy usage and Incremental savings would more clearly show the methodology and results. More columns may be required to show certain details such as the adjustment for savings from other ECM programs. Presumably such a table would also make clear how the value of 0.431 "Adjustment Ratio for Energy Savings" was calculated.	EMIS-SV-3	Complete	ENS agrees with this recommendation. To help communicate results more clearly in the 2017 Custom Incentives (EMIS) evaluation report, the Evaluator added summary tables of all reviewed EMIS projects. These tables include measures implemented, non-routine adjustments, adjustment ratios, and savings for each participant. The Evaluator used their best judgment to apply the Verification Consultant's recommendations, while balancing the need for clear and transparent information in the report and protection of participant information.	Complete
Add the following SEM related terms to the Definitions (p. iii): Baseline regression, Projected baseline, Adjusted baseline, Cumulative SEM/EMIS savings, Incremental SEM/EMIS savings. The SEM/EMIS definitions for cumulative and incremental savings should reference the relationship between reported energy usage and the projected baseline.	SEM-SV-R1	In Progress	ENS agrees with this recommendation. SEM did not achieve savings in 2017 and therefore, the Evaluator did not write a 2017 SEM evaluation report. The Evaluator will define all relevant terms in the 2018 SEM evaluation report.	2018

Table 4
Update on Implementation of 2016 Verification Recommendations

Recommendation Text	Source	Status	Comments	Expected Period of Completion
We support the Service Provider recommendation of a longer engagement with SEM participants.	SEM-SV-R2	Deferred	At this time, ENS does not have all of the information it needs to perform a full analysis of the cost-effectiveness of extending the SEM cycle. ENS will consider implementing this recommendation in a future year.	To be considered in a future year
One way to more clearly communicate the approach is to show the results for each step and each project. Having a table with columns for 2016 Projected baseline, Adjustments, Adjusted baseline, Actual energy usage and Incremental savings would more clearly show the methodology and results. More columns may be required to show certain details such as the adjustment for savings from other ECM programs. Presumably such a table would also make clear how the value of 0.463 "Adjustment Ratio for Energy Savings" was calculated.	SEM-SV-R3	In Progress	ENS agrees with this recommendation. SEM did not achieve savings in 2017 and therefore, the Evaluator did not write a 2017 SEM evaluation report. The Evaluator will consider how to refine the presentation of SEM data in the 2018 SEM evaluation report.	2018
Edits/Corrections: On P. 55, Figure 11, should the 2015 participant bar be 6 and not 9? On P. 64, third bullet, should the bullet read "Three respondents..." instead of "Two respondents..." See Table 24, p 62.	SEM-SV-4	Complete	ENS and its Evaluator reviewed the 2016 Custom Incentives (SEM) evaluation report and confirmed the following: (1) The 2015 participant bar is correct. There were nine participants in total: three continuing participants from the previous year and six new participants. (2) The third bullet on P. 64 is correct. It refers to the third column titled "Resources Provided" in Table 25 above the text.	Complete
For future evaluations, please systematically address what savings would have resulted naturally via Naturally Occurring Market Adoption Factors (NOMADs) for each MEP, and decrease impacts by those amounts for each MEP.	SV-MEPS-1	Not Recommended for Action	ENS appreciates this recommendation but notes that influencing codes and standards (also known as Minimum Energy Performance Standards (MEPS)) is not a primary focus for ENS. ENS reports on these energy savings for informational purposes only, but does not claim them. Because of this, and as pursuing this recommendation would have a significant impact on the evaluation budget, ENS does not suggest pursuing this recommendation at this time.	N/A
In the next evaluation, the evaluator should carry out the attribution step for each MEP.	SV-MEPS-2	Not Recommended for Action	ENS appreciates this recommendation but notes that when new codes and standards come into effect, ENS does not provide incentives for these measures because its influence is not required to achieve savings. Additionally, without significant ENS resources going toward influencing new codes and standards, ENS expects that savings attributable to ENS would be minimal. Because of this, and as pursuing this recommendation would have a significant impact on the Codes & Standards evaluation budget, ENS does not suggest pursuing this recommendation at this time.	N/A
Focus the 2017 evaluation on the same standards as evaluated in 2016. While the new standards set forth in Amendment 13 will come into force at the end of June 2017, their impact may be limited until January 2018, since retailers need a few months to sell their existing stocks.	SV-MEPS-3	Complete	ENS's Evaluator included some Amendment 13 product types in the 2017 Codes & Standards evaluation. ENS and its Evaluator agree with the rationale behind this recommendation, however, based on preliminary investigation, the market-lag typically associated with the introduction of new product regulations was largely absent with respect to certain Amendment 13 products. Therefore, additional products were added to the 2017 Codes & Standards evaluation.	Complete