

ENSC 2012 DSM Plan Filing (NSUARB-E-ENSC-R-10)
ENSC Responses to Synapse Information Requests

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Request IR-1:

With respect to page 14, Figure 5.1,

- a) Please provide the results for the TRC test in terms of costs, benefits and net benefits in cumulative present value dollars, for each program and the total.**
- b) Please provide the results for the PAC test in terms of costs, benefits and net benefits in cumulative present value dollars, for each program and the total.**
- c) Please provide the worksheets and calculations used to determine the TRC and PAC results.**

Response IR-1:

- a) Please refer to the table below, entitled: TRC/PAC Benefits and Costs Data.**
- b) Please refer to the table below, entitled: TRC/PAC Benefits and Costs Data.**
- c) Please refer to Confidential Attachment 1, filed electronically.**

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1 TRC/PAC Benefits and Costs Data

	TRC Benefits (million)	TRC Costs (million)	Benefit/ Cost Ratio Total Resource Cost Test (TRC)¹	PAC Benefits (million)	PAC Costs (million)	Benefit/ Cost Ratio Program Administrator Cost Test (PAC)²
ENABLING STRATEGIES						
Education and Outreach	-	\$2.0	-	-	\$2.0	-
Development and Research	-	\$1.5	-	-	\$1.5	-
Other Enabling Strategies	-	\$1.5	-	-	\$1.5	-
RESIDENTIAL PROGRAMS						
Efficient Products ³	\$13.3	\$7.0	1.9	\$13.3	\$4.0	3.3
Existing Houses ³	\$24.3	\$12.6	1.9	\$24.3	\$9.7	2.5
New Houses	\$10.0	\$6.8	1.5	\$10.0	\$4.3	2.3
Home Energy Report ³	\$1.3	\$0.9	1.5	\$1.3	\$0.9	1.5
PROGRAMS						
Prescriptive	\$22.5	\$8.4	2.7	\$22.5	\$4.5	5.0
Custom	\$47.6	\$23.1	2.1	\$47.6	\$9.2	5.1
Small Business Direct Install	\$16.7	\$7.9	2.1	\$16.7	\$6.0	2.8
Total	\$135.7	\$71.7	1.9	\$49.0	\$43.7	3.1

Currency is expressed in 2012 dollars. Numbers may not sum exactly due to rounding.

1. TRC compares the sum of ENSC's and participants' investments against the direct benefits to Nova Scotia (such as avoided costs).

2. PAC compares ENSC's (i.e. NSPI ratepayers') costs against the direct benefits to Nova Scotia (avoided costs of electrical capacity and energy).

3. Includes participation by low-income households

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Request IR-2:

With respect to page 14, Figure 5.1,

a) Please provide the cent/kWh charge that will be applied to ratepayers to collect the 2012 total DSM budget of \$43.7 million. If appropriate, please provide the charges separately for each customer class.

b) Please provide cent/kWh charge that is currently applied to ratepayers to collect the 2011 total DSM budget. If appropriate, please provide the charges separately for each customer class.

c) Please provide cent/kWh charge that was applied to ratepayers to collect the 2010 total DSM budget. If appropriate, please provide the charges separately for each customer class.

Response IR-2:

a) The charge to ratepayers in 2012 will be established through the annual UARB-approved cost allocation process, to take place later in 2011.

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b) The following figure provides the 2011 Demand Side Management Cost Recovery Rider for each rate class. "NA" indicates no charge.

Customer Class	2011 Demand Side Management Cost Recovery Rider (cents per kWh)
Domestic Service	0.466
Domestic Service Time-of-Day	0.466
Small General	0.721
General	0.484
Large General	0.501
Small Industrial	0.214
Medium Industrial	0.328
Large Industrial incl. Interruptible Rider	0.198
Municipal	0.441
Gen. Replacement & Load Following	0.035
Load Retention	NA
Extra High Voltage Real Time Price	NA
High Voltage Real Time Price	NA
Distribution Voltage Real Time Price	NA
Wholesale Mkt. Backup/Top-up	NA
Extra Lg. Ind. Two-Part RTP	0.081
Mersey System Additional Energy	0.069
Unmetered Services	0.132

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- 1 c) The following figure provides the 2010 Demand Side Management Cost Recovery Rider
 2 for each rate class. "NA" indicates no charge.
 3

Customer Class	2010 Demand Side Management Cost Recovery Rider (cents per kWh)
Domestic Service	0.193
Domestic Service Time-of-Day	0.193
Small General	0.543
General	0.271
Large General	0.495
Small Industrial	0.127
Medium Industrial	0.261
Large Industrial incl. Interruptible Rider	0.112
Municipal	0.249
Gen. Replacement & Load Following	0.047
Load Retention	NA
Extra High Voltage Real Time Price	NA
High Voltage Real Time Price	NA
Distribution Voltage Real Time Price	NA
Wholesale Mkt. Backup/Top-up	NA
Extra Lg. Ind. Two-Part RTP	0.049
Mersey System Additional Energy	0.056
Unmetered Services	0.405

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Request IR-3:

Please provide any analyses that ENSC or NSPI have performed to indicate the short-medium- or long-term rate impacts of the 2012 DSM programs. Please provide any and all documentation of such analyses.

Response IR-3:

ENSC and NSPI have not performed any specific analyses to indicate the short- medium- or long-term rate impacts of the 2012 DSM programs, except for the preliminary program cost information included in Appendix B of ENSC's Evidence.

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Request IR-4:

Please provide any analyses that ENSC or NSPI have performed to indicate the short-medium- or long-term bill impacts of the 2012 DSM programs. Please provide any and all documentation of such analyses.

Response IR-4:

Please refer to Synapse IR-3.

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Request IR-5:

With respect to page 23, paragraph 2, please provide any assessment you have of the extent to which the energy efficiency savings in the 2012 DSM Plan will help contribute to the objective outlined in Nova Scotia's Environmental Goals and Sustainable Prosperity Act. In particular, please provide any quantitative estimates you have of the greenhouse gas emissions avoided by the efficiency savings in the 2012 DSM Plan, as well as the extent to which they will help NSPI comply with the 2015 and 2020 greenhouse gas emission targets.

Response IR-5:

Nova Scotia does not have intensity based emissions targets. The provincial government has enacted legislation that sets hard caps on GHG emissions in Nova Scotia to 10 percent below 1990 levels by 2020.

In a report on Nova Scotia Power's environmental performance, NSPI states:

In August 2009, the Province announced limits on greenhouse gas emissions from Nova Scotia's electricity sector, starting in 2010. The intention is to limit emissions through a series of staged caps, moving from an average of 9.6 million tonnes for 2010-2011 to 7.5 million tonnes by 2020. In 2009, our generating stations emitted 9.4 million tonnes of greenhouse gases.¹

In 2009, NSPI had the following electricity production: 8,177 GWh from coal and petroleum coke, 1,612 GWh from natural gas, 307 GWh from oil and diesel, 1,065 GWh from renewables and 931 GWh of purchased power, for a total of 12,092 GWh overall and 10,096 GWh from fossil fuels.²

¹ "Investing in Nova Scotia's Future – A Report on Nova Scotia Power's Environmental Performance – 2009", page 5, Nova Scotia Power – Environment, 2011, Nova Scotia Power Inc.,
<http://www.nspower.ca/en/home/environment/report.aspx>

² "Energy everywhere – 2009 Annual Financial Report", page 19, Emera – Financials & MD&A, February 2010, Emera Inc.,
<http://www.snl.com/Cache/9329736.PDF?D=&O=PDF&IID=4072693&OSID=9&Y=&T=&FID=9329736>

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- 1 DSM contributes to meeting hard caps on GHG emissions through electricity load reduction, as
2 identified in the IRP. Its effect depends on the type of generation that it displaces and is,
3 therefore, a function of the generation mix at the time DSM saves energy.
4
- 5 Therefore, although not an accurate representation – but rather, for illustrative purposes only,
6 assuming a GHG emissions per GWh generated from fossil fuels ratio comparable to 2009, and
7 assuming that DSM energy savings displace that mix of fossil fuel generation, the 214 GWh
8 savings in the 2012 DSM Plan would save approximately 200,000 tonnes of greenhouse gases.

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NON-CONFIDENTIAL**Request IR-6:**

With respect to Appendix A, the 2012 DSM Plan, please provide customer participation rates for each of the residential and commercial & industrial programs. Please present in terms of (a) number of customers participating in the program, and (b) percent of total eligible customers participating in the program.

Response IR-6:

For 2012, the number of units (U), participants (P) and facilities (F) are estimated in the following figure.

	A	B	C
2012	Estimated Eligible Customers	Number of Units/Participants/Facilities	Participation Rate (C=B/A)
Efficient Products	450,000	58,349 (U)	n/a*
Existing Houses	330,000	2,500 (P)	0.8%
New Houses	3,000	665 (P)	22.2%
Home Energy Report	380,000	65,000 (P)	17.1%
Prescriptive Rebates	40,000	86,640 (U)	n/a*
C&I Custom	2,500	200 (F)	8.0%
Small Business Direct Install	35,000	650 (F)	18.6%

* Not applicable, one customer may install multiple measures.

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Request IR-7:

Please provide customer participation rates for each of the residential and commercial & industrial DSM programs, separately for each of the years 2008, 2009, 2010 and 2011. Please present in terms of (a) number of customers participating in the program, and (b) percent of total eligible customers participating in the program.

Response IR-7:

The figures below show the estimated total eligible customers, number of units/participants/facilities and participation rates by program. For 2008-2009 the number of units, participants and facilities are evaluated and verified. For 2010 these numbers are evaluated and for 2011 these numbers are estimated.

Figure 1

	A	B	C
2008-2009	Estimated Eligible Customers	Number of Units/Participants/Facilities	Participation Rate (C=B/A)
Efficient Products - Residential	440,000	93,324 (U)	n/a*
Existing Houses	330,000	520 (P)	0.2%
Low Income	55,000	521 (P)	0.9%
New Houses	3,000	77 (P)	2.6%
Efficient Products - Direct Install	40,000	4,523 (F)	11.3%
Prescriptive Rebates	40,000	1,400 (F)	n/a*
C&I Custom	2,500	49 (F)	2.0%
Small Business Direct Install	35,000	307 (F)	0.9%

* Not applicable, a customer may install multiple measures.

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1 **Figure 2**

2010	A	B	C
	Estimated Eligible Customers	Number of Units/Participants/Facilities	Participation Rate (C=B/A)
Efficient Products - Residential	440,000	205,916 (U)	n/a*
Existing Houses	330,000	1,516 (P)	0.46%
Low Income	55,000	680 (P)	1.24%
New Houses	3,000	260 (P)	8.67%
Efficient Products - Direct Install	40,000	5,447 (F)	13.62%
Prescriptive Rebates	40,000	10,780 (U)	n/a*
C&I Custom (incl. New Construction)	2,500	47 (F)	1.88%
Small Business Direct Install	35,000	801 (F)	2.29%

2 * Not applicable, a customer may install multiple measures.

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1 **Figure 3**

2011	A	B	C
	Estimated Eligible Customers	Number of Units/Participants/Facilities	Participation Rate (C=B/A)
Efficient Products - RMD	440,000	160,000 (U)	n/a*
Existing Houses	330,000	1,500 (P)	0.5%
Low Income	55,000	900 (P)	1.6%
New Houses	3,000	900 (P)	30%
Efficient Products - Direct Install	40,000	3,000 (F)	7.5%
Prescriptive Rebates	40,000	176,000 (U)	n/a*
C&I Custom	2,500	150 (F)	6.0%
Small Business Direct Install	35,000	700 (F)	2.0%

2 * Not applicable, a customer may install multiple measures.

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Request IR-8:

With respect to Appendix C, page 18, bullet #2, please explain the statement that “IRP targets in the short term (2011-2012) may be too ambitious.” Please explain the extent to which the targets are too ambitious with respect to the following factors (a) achieving deeper savings per customer than in the past, (b) administering programs that have higher savings goals, (c) marketing programs to customers, (d) obtaining the relevant contractors, vendors, manufacturers and equipment associated with the higher savings, or (e) other factors.

Response IR-8:

Dunsky’s report pointed to the unprecedented challenge that the IRP ramp-up would represent. This was provided as a high-level assessment and was not the primary focus of the report. As such, the report did not seek to break down this challenge by each of the components indicated above.

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Request IR-9:

With respect to Appendix C, page 20, Figure 2, please provide all of the numbers underlying the chart, including eligible demand (GWh), program savings (GWh), and non-program savings (GWh), for each year.

Response IR-9:

All data points are presented in the table below. Please note that the distribution of savings from program and non-program activities is for illustrative purposes only, as indicated in the report. Eligible (non-ELI) energy is derived from the most recent non-ELI market share (81.2 percent) multiplied by the total energy forecast presented in the 2009 IRP Update.

Year	Savings (% Eligible Energy)	Savings (Program GWh)	Savings (Non- Program GWh)	Incremental Achievable Potential Energy Savings (GWh)	Eligible (non- ELI) Energy (GWh)
2008	0.21	21	0	21	10,186
2009	0.49	50	0	50	10,137
2010	0.81	83	0	83	10,193
2011	1.42	134.32	11.68	146	10,248
2012	1.98	180.4	24.6	205	10,338
2013	2.93	256.2	48.8	305	10,415
2014	2.63	220.8	55.2	276	10,494
2015	2.61	209.76	66.24	276	10,567
2016	2.60	198.72	77.28	276	10,628
2017	2.51	182.24	85.76	268	10,688
2018	2.43	167.04	93.96	261	10,757
2019	2.36	158.1	96.9	255	10,826
2020	2.29	149.4	99.6	249	10,886
2021	2.22	145.8	97.2	243	10,941
2022	2.16	142.8	95.2	238	11,004
2023	2.11	139.8	93.2	233	11,062
2024	2.06	137.4	91.6	229	11,118
2025	2.01	135.0	90.0	225	11,169
2026	1.97	132.6	88.4	221	11,222
2027	1.92	130.2	86.8	217	11,275
2028	1.89	128.4	85.6	214	11,328
2029	1.85	126.6	84.4	211	11,380
2030	1.83	125.4	83.6	209	11,432
2031	1.79	123.6	82.4	206	11,484

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Request IR-10:

With respect to Appendix C, page 20, Figure 2, please provide a similar chart presenting the DSM expenditures as a percent of total NSPI revenues. Please provide all of the numbers underlying the chart, including total NSPI revenues and DSM expenditures.

Response IR-10:

ENSC does not have NSPI's projected revenue data to produce the requested chart.

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Request IR-11:

With respect to Appendix C, page 22, Figure 4, please provide ENSC's views on the alternative ramp-up schedule shown. In particular:

a) Does ENSC believe that the alternative ramp-up schedule is appropriate? If not, why not?

b) Does ENSC believe that the alternative ramp-up schedule is achievable? If not, why not?

c) Does ENSC intend to follow the alternative ramp-up schedule in future years?

Response IR-11:

a) Yes. ENSC believes that the alternative ramp-up schedule is appropriate from a medium to long-term IRP perspective; and yet, the cumulative annual savings targets are ambitious, even when considering the combined effect of DSM programs, Codes and Standards and incremental energy savings from conservation efforts outside DSM programs.

b) Yes.

c) The ramp-up schedule for future year DSM Plans will continue to take direction from IRP updates and will be adjusted accordingly, while accounting for incremental energy savings from Codes and Standards as well as other significant and verifiable incremental energy savings from efficiency and conservation efforts outside of DSM programs.

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Request IR-12:

With respect to Appendix C, page 27, paragraph 2, please present a three-year projection of IRP DSM savings targets as an illustration of likely future targets for ENSC, in the same way that this was done for past DSM plans.

Response IR-12:

Please refer to Figure 4.1 on page 11 of the Evidence.

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Request IR-13:

With respect to Appendix C, page 23, Issue C, please provide ENSC's views on the 2008 ACEEE and 2009 EEDAL papers by David Nichols and Kenji Takahashi which indicate that DSM costs per MWh in other jurisdictions have decreased as energy efficiency program budgets increased. For reference, those papers are attached.

Response IR-13:

ENSC has not analyzed the data behind each of the examples provided in the referenced papers. ENSC does agree, however, that under certain circumstances, efficiency opportunities arise that can lower the unit cost of savings even as overall savings increase. For example, budget-constrained programs focused on low-cost savings opportunities, such as promoting CFLs, can benefit from economies of scale when those budgets (and associated savings targets) are allowed to increase, and where the baseline penetration of CFLs is still low, as was the case in the timeframe reviewed. Similarly, program administrators can, over time, improve their ability to affect market decisions, climbing a learning curve that can improve the value of their overall spending (the slope of that curve depends on how much experience they benefited from at the outset). Finally, technological, market and program administrator innovations can all contribute to the emergence of new opportunities and/or cost savings.

This logic may not apply equally in all jurisdictions, timeframes or circumstances. For example, its context may differ from those examined in the paper in a number of ways, including:

- **Regional Context:** Ten of the 16 cases examined are located in two U.S. states (California and Massachusetts). These states may have unique characteristics that are not shared in Nova Scotia, such as electricity rates or supportive fiscal or other policies that may have been enacted during periods of more aggressive DSM activity).

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- Different learning curve opportunity: A significant number of the data points from the referenced studies cover the early-to-mid 1990s, when North America was just beginning its first-generation DSM effort – a context that would be expected to produce a steep learning curve and efficiency gains over time. In contrast, ENSC and its predecessor, NSPI, have both benefitted from the successes, failures and lessons learned by long-standing North American DSM leaders – notably Massachusetts, which represents eight of the 16 cases examined in the paper. As a result, ENSC does not face the learning curve the industry experienced 20 years ago.
- Technology opportunity: The remaining data points examined by the referenced papers cover the early-to-mid 2000s, the “second generation” DSM timeframe. Program administrators in this period benefitted from some exceptional, low-cost savings opportunities, most notably the market penetration of CFLs. CFLs were “game changers”, offering a unique combination of:

 - very high (75 percent) electricity savings
 - low first cost (i.e. no real capital barrier)
 - considerably declining costs over the period
 - very low initial saturation rates (i.e. considerable room for growth)
 - an end-use that represented a significant share of consumption.

These factors facilitated considerable growth in absolute savings, at a declining cost. During this period, many programs relied heavily on the CFL opportunity for their savings. For example, in 2008, CFLs accounted for 90 percent of Efficiency Vermont’s residential sector savings, or half of its total savings across all sectors, a share not uncommon among leading U.S. program administrators. However, in the future, Nova Scotia will not benefit from that unique context, primarily for three reasons:

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- the high current saturation rate of CFLs (approximately 10 per household which, when considering the presence of specialty bulbs, makes continued growth more difficult)
 - CFL costs have largely stabilized
 - new Canadian federal standards that, beginning in 2012, will decrease the electricity use delta between incandescent lamps and CFLs by roughly one-third.

In the long-term, new innovations could produce the “next CFL”; however no such measure can presently be counted on in the coming years for planning purposes.

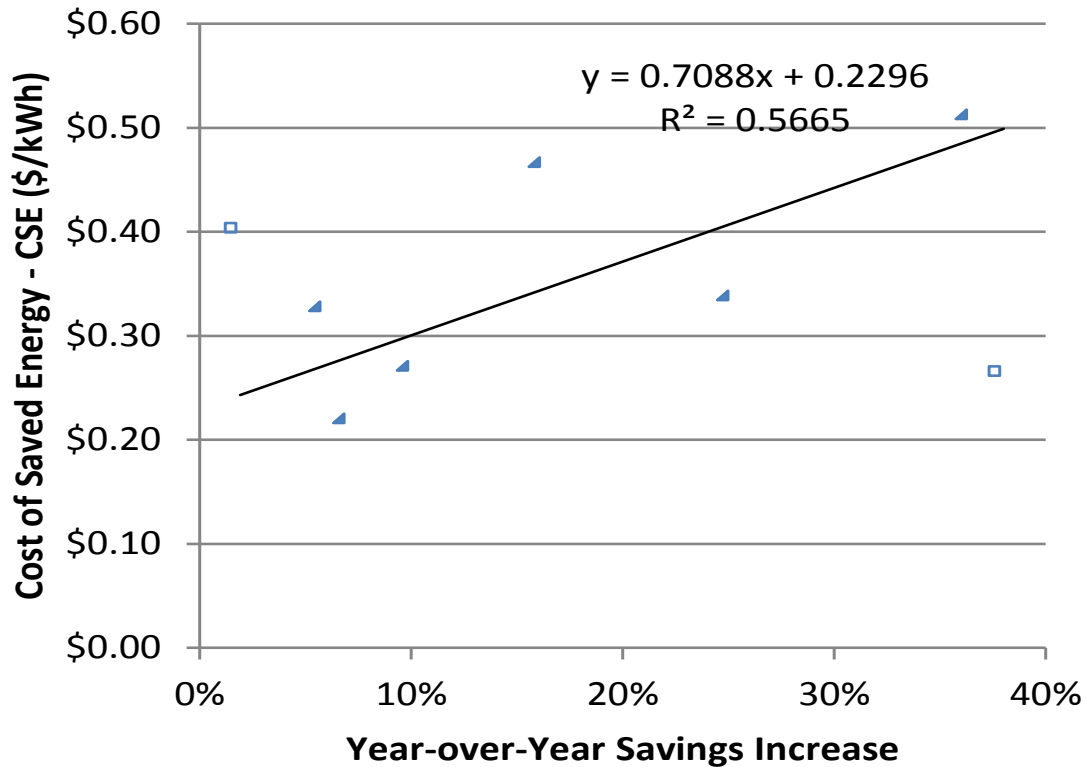
ENSC and its consultants have seen early evidence of recent DSM plans – including in those regions examined by the paper – anticipating considerable unit cost increases in the coming years. For example, as noted in Dunskey’s report, the latest Massachusetts plan (for the State’s investor-owned utilities), which aims for incremental annual savings of 2.4 percent/year (the highest in the U.S.), now foresees average unit costs of \$0.52/kWh. This is approximately 50 percent higher than the unit cost for incremental annual savings indicated in Figure 2 of the referenced paper.

Recent data and analysis produced by ENSC’s consultants for other clients suggest a different relationship between unit costs and depth of savings. In particular:

- Relationship over time: A recent analysis by Dunskey Energy Consulting focused on approved plans for 2010 through 2012 suggests a positive relationship between unit costs and the speed with which DSM administrators are expected to ramp up. The graph below provides the cost of saved energy (CSE) compared with annual growth in savings depth (%) for six comparable regions, suggesting that the steeper the ramp-up, the higher the average first-year unit cost.

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CSE vs. Savings Growth (2nd Order)
 (Canadian and U.S. Examples)



- In-year relationship: A recent Navigant Consulting benchmarking study focused on achieved 2008 results suggests an even or positive relationship between unit costs and savings depth.¹ The graph below provides the cost of saved energy (CSE) compared with depth of savings (%) for twenty comparable regions.

¹ Navigant Consulting, 2010. *Benchmarking of Vermont's 2008 Electric Energy Efficiency Programs: A Comparative Review of Efficiency Vermont and Burlington Electric Department*. For Vermont Department of Public Service, May 21, 2010.

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4 For all of these reasons, ENSC anticipates a positive relationship between its unit costs and
 5 savings depth for Nova Scotia in the coming years. The metric discussed here (the focus of both
 6 the referenced paper and the graphs presented above) is focused solely on first-year kWh
 7 savings, and, therefore, reflects only a fraction of the value inherent in the DSM plan. In future
 8 years it will be important to focus increased attention on the levelized dollar per lifetime kWh,
 9 which enables a closer “apples-to-apples” comparison for benchmarking purposes.