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Request IR-1:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan - Page 21, Line 17:

Please provide:

- (a) the annual amounts spent on advertising by type (i.e. television, print, etc.) in each of 2012 to 2014, inclusive and the budgeted amounts for 2015 to 2018, inclusive; and,
- (b) any studies/analysis in support of the rationale for the above spends by media type and an explanation of how they individually contribute to E1 goals.

Response IR-1:

- a) Please refer to the table below. 2016-2018 DSM implementation budgets, including an advertising budget, will be developed after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan.

Expenditure by Advertising Type - DSM Portion				
	2012 Actual (\$k)	2013 Actual (\$k)	2014 Actual (\$k)	2015 Budget (\$k)
Television	63	238	174	148
Print	179	135	87	68
Online	184	173	150	109
Radio	189	161	54	46
Out of Home (Bus Shelters)	6	-	102	53
Promotional Materials	250	297	258	296
Total	871	1,004	825	720

Note: Expenditures by advertising type does not include production costs or agency fees

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b) The media strategy is developed using research to identify target audiences and understand their media consumption habits. ENS is not able to provide the specific studies as they are subscription-based. Sources include online media consumption statistics from Print Management Bureau (biennial), Numeris (biannual), comScore (biannual) and RTS (biannual). These studies indicate television dominates in recall above radio, online and newspaper and is considered the most influential and persuasive of all media with Atlantic Canadians (Numeris). Television also has the highest percentage of weekly time spent for the target audience. Given these advantages, ENSC gave this channel the most weight in 2013 and 2014, supported by other channels to achieve a consistent top-of-mind awareness. Three general criteria are used to determine media weights:

1. Appropriateness for the sector (BNI versus Residential);
2. Appropriateness for achieving specific marketing goals; and
3. Ability to maintain a consistent level of reach and frequency.

Annual advertising budgets are set to reflect the energy savings required in each program based on the criteria above, as well as the observed historical relationship between advertising and energy savings. Advertising expenditures are then adjusted throughout the year, by program, based on how well programs are tracking in terms of energy savings. If a specific program is exceeding targets, advertising is decreased for that program, and vice versa.

ENS's marketing strategy is working to achieve three goals:

1. Increase awareness of ENS:

Increasing awareness was a priority in 2012 and 2013, which is a standard practice for new brands. To that end, more weight was given to television in 2013 and 2014, due to its effectiveness and reach. Unaided awareness increased from 16 percent in Q4 2012 to 37 percent in Q4 2014. Given the success in achieving adequate awareness levels, less weight will be given to improving awareness in 2015.

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2. Drive program uptake:

ENS monitors the impacts of advertising on program uptake and adjusts accordingly. For example, a 40 percent year-over-year reduction in Appliance Retirement advertising expenditures in the spring of 2013 resulted in a 15 percent downturn in program uptake. Consequently, advertising was increased with radio and print ads, resulting in an increase in participation levels to meet savings targets.

3. Educate the public and change energy usage behaviour:

Education is an important component of behaviour change for energy efficiency. Surveys show that close to 20 percent of Nova Scotians indicated that ENSC influenced a change in their energy consumption behaviour in 2013; up from approximately 5 percent at the beginning of 2013.

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Request IR-2:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan - Pages 18-26:

For each of the categories of “Enabling Strategies” identified, please provide:

- (a) the level of expenditure by year (2012, 2013, 2014);**
- (b) the level of energy and demand savings attributable to that strategy in each year;**
- (c) any other quantifiable benefit specifically attributable to that strategy in each year;
and,**
- (d) any other qualitative benefit specifically attributable to that strategy in each year.**

Please provide items (a) through (d) separately for each of the following enabling strategies:

- Education and Outreach;**
- Development and Research; and**
- Other Enabling Strategies;**
- Advertising;**
- Property-Assessed Clean Energy (PACE) Financing Support;**
- Working with Governments;**
- Capacity Building; and**
- Regulatory Affairs.**

Response IR-2:

- a) Please refer to the table on the following page.**

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1

Enabling Strategies - DSM Portion			
	2012 (\$k)	2013 (\$k)	2014 (\$k)
Development and Research	2,848	1,889	1,635
Education and Outreach *	1,647	1,638	1,712
Other			
Codes and Standards	167	132	61
Innovative Financing	51	67	-
Other	263	468	216
Total Other	481	667	277
Total Enabling Strategies	4,976	4,194	3,624

*Education and Outreach includes corporate advertising. Total spend was \$62k in 2012, \$87k in 2013, and \$91k in 2014.

2

3 b) An objective of Enabling Strategies is to drive increased participation in ENS's programs
4 and services through activities such as awareness and education. Enabling Strategies also
5 drive market transformation for energy-efficient products and advance energy efficiency
6 standards and industry practices. They support and help to facilitate the achievement of
7 energy savings and demand reduction within programs, where the savings are accounted
8 for. For this reason, there are no energy or demand savings directly attributable to
9 Enabling Strategies over 2016-2018, with the exception of the energy savings from the
10 Holiday Light Exchange program.

11

12 However, program energy savings can be achieved as an indirect result of Enabling
13 Strategies activities. For example, primary research enabled the Home Energy
14 Assessment program component to achieve 0.42 GWh in additional energy savings in
15 2011 and 2012, and 1.66 GWh of energy savings in 2013. Similarly, DSM consultants
16 conduct research into new programs and services, which enables ENS to achieve energy
17 and peak demand savings through these offerings. For example, the research and pilot

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1 conducted for the development of Fuel Substitution and Green Heat program component
2 have enabled energy savings of 4.5 GWh from 2012 through 2014.

3
4 The advancement of energy efficiency standards for devices and equipment, which ENS
5 contributes to through its Enabling Strategies work, enables energy and demand savings.
6 ENSC's third-party evaluator conducted evaluations of the impact of new energy
7 efficiency codes and standards affecting Nova Scotia in 2012, 2013 and 2014. These are
8 reported as savings outside of DSM programs.

9
10 c) **Development and Research**

11 Research over the period of the 2016-2018 Plan could aid in the identification of new
12 programs and measures, and could increase the efficiencies of ENS's services. For
13 example, research conducted in 2012 and 2013 led to a pilot program to assess the impact
14 of a "wash in cold water" program. Results of the pilot showed a 60 percent reduction in
15 warm water usage among participants.

16
17 Activities included in the 2016-2018 Regulatory Affairs component of Other Enabling
18 Strategies were included under Development and Research in 2012 through 2014.
19 Regulatory Affairs, including engagement with regulatory stakeholders and the DSM
20 Advisory Group, ENS's annual UARB assessment, UARB-appointed consultant cost
21 recovery, and legal costs specifically related to regulatory work, ensures ENS meets its
22 regulatory requirements.

23
24 **Education and Outreach**

25 Quantifiable benefits for Education and Outreach over 2016 to 2018 would build on
26 benefits in earlier years. For example, at the end of 2014, there were 132 schools
27 participating in the Green Schools Nova Scotia program, up from 87 in 2013 and 49 in
28 2012. Additionally, there were approximately 30,000 students reached through Green
29 Schools in 2014, and more than 2,000 of those students directly participated on a "Green
30 Team." Relatedly, quantifiable benefits for the Green Schools Nova Scotia program in

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1 2016, 2017 and 2018 would include the number of schools participating in the Green
2 Schools Nova Scotia program, the number of students participating in Green Teams and
3 the number of students affected by the program, both directly and indirectly. Other
4 quantifiable benefits over 2016 to 2018 could include participants' satisfaction with the
5 program, their awareness of energy efficiency, and the adoption of energy efficient
6 practices by participating schools.

7
8 Quantifiable benefits in 2016 to 2018 specifically attributable to community events and
9 other public speaking and presentations on energy efficiency would build on benefits
10 from earlier years. For example, in 2014 ENSC visited 26 communities during its
11 Summer Tour, up from 24 in 2013 and 20 in 2012. Sixty-one percent of respondents to a
12 2014 survey administered by Corporate Research Associates (CRA) rated their overall
13 experience at ENSC booth as *very worthwhile*, compared to 44 per cent in 2012. As a
14 result of visiting ENSC's booth, 58 percent of visitors learned useful tips on how to better
15 use energy, up from 47 percent in 2012. The proportion of visitors who said they
16 implemented some form of energy saving behaviour as a result of their visit to the booth
17 also increased over 2012. Relatedly, quantifiable benefits in 2016 to 2018 would include
18 the number of communities visited, the number of Nova Scotians attending the event
19 and/or presentation, the proportion of attendees who increase their energy efficiency
20 knowledge and/or implement energy efficient behaviour.

21
22 Quantifiable benefits in 2016 to 2018 specifically attributable to the use of social media
23 as an education and outreach tool would build on benefits from earlier years. ENS uses
24 various metrics to monitor the effectiveness of its social media efforts. For example, in
25 2014, ENSC experienced a seven percent increase in Facebook 'likes' and a 40 percent
26 increase in Twitter followers compared to 2013. Quantifiable benefits in 2016 to 2018
27 would include an increase in the number of 'likes' and followers across social media
28 channels like Facebook, Twitter and LinkedIn, along with measures of 'engagement'
29 with ENS' social media content.

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Also included under Education and Outreach are expenditures associated with advertising and the Efficiency Nova Scotia website. Quantitative benefits have not been directly linked to corporate advertising or the ENS website, although EfficiencyOne tracks quantitative measures to monitor the effectiveness of each. Advertising recall is a standard marketing metric to assess ad breakthrough, a measure of how effective ENS ads are in breaking through all other advertisements and reaching the public. While advertising recall is not broken out into corporate and program-specific recall, ENS advertising recall increased from 57 percent in Q4 2012 to 74 percent in Q4 2014.

Numerous website metrics are tracked to provide insight into website usage, including traffic and activity on the website. Total website visits for the July-December period increased by 15 percent in 2014, with over 180,000 visits during that time. Over 25 percent of Nova Scotians visited the ENS website in 2013 and 2014.

Additionally, quantifiable benefits in 2016 to 2018 would build on awareness of ENSC from earlier years. For example, unaided awareness increased from 16 percent in Q4 2012 to 37 percent in Q4 2014. Total awareness (aided and unaided) was 85 percent in Q4 2014.

Other Enabling Strategies

Quantifiable benefits associated with Property Assessed Clean Energy (PACE) financing support, which is offered by municipalities, include uptake of ENS Residential services from 2016 to 2018. Another quantifiable benefit includes the cost of energy savings achieved through the PACE offering in comparison to other financing and rebate models.

Quantifiable benefits associated with Capacity Building include improved engagement with partners as a result of referrals from the ENS contractor list. Statistics show that referrals from the ENS contractor list have significantly lower bounce rates (the percentage of visitors who enter ENS's website and leave without viewing other pages), spend more time on the website, and view more pages than other traffic.

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ENS's involvement in Codes and Standards (described in the 2016-2018 DSM Resource Plan as Working with Governments) helps to improve the efficiency of electricity-consuming devices and equipment, through either voluntary manufacturer adoption or regulation. ENS's involvement helps to develop and advance these standards in energy efficiency regulation and policy at the national and provincial levels.

d) Development and Research

The primary qualitative benefit of research in each year is the direction it provides for DSM Resource Plans and program delivery and development. For example, a rigorous study of retail product rebate levels in 2014 provided insight into the development of optimum rebate levels. Another outcome of the study led to the development of evaluation criteria for calculating energy savings associated with the reductions in warm water usage. Research into motivations and barriers to program participation were conducted in 2013 and 2014 for several programs, providing information about customer perceptions and intentions which, guided business decisions about ways to evolve programs.

Education and Outreach

Qualitative benefits in 2016 to 2018 would include the expansion of a culture of energy efficiency within Nova Scotia. Another qualitative benefit specifically attributable to the Bright Business Conference in each year is the awareness of the success and leadership of Nova Scotia's energy efficiency industry and the opportunity for industry participation, networking and collaboration.

In regards to the qualitative benefits of advertising, ad recall measures illustrate that ENSC and ENS messages are reaching the public, which means a strong likelihood that ENS will be top of mind for Nova Scotians looking to take energy efficiency action. This in turn drives program uptake.

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In regards to the ENS website, the large percentage of Nova Scotians who use it annually qualitatively illustrates the importance of this channel to Nova Scotians.

Other Enabling Strategies

Qualitative benefits associated with Property Assessed Clean Energy (PACE) financing support for 2016 to 2018 include an additional channel that enables homeowners to participate in efficiency programs, providing more choice in financing options for efficiency upgrades.

The advancement of energy efficiency Codes and Standards, included under Working with Governments, provides qualitative benefits, such as increased performance and design of products and equipment as a result of improved energy performance, in addition to non-energy benefits that result directly from increases in energy efficiency (e.g. avoided emissions). In addition, participation in energy efficiency standards development allows a valuable opportunity for collaboration and discussion between various organizations in the industry. These include manufacturers, electricity utilities, energy efficiency organizations, and governments.

Qualitative benefits of Capacity Building include the increased awareness and knowledge of energy efficiency practices among ENS's trade partners as a result of ENS-sponsored training. This strategy also builds awareness among industry organizations such as the Building Owners & Managers Association of Nova Scotia and the Investment Property Owners Association of Nova Scotia. ENS also expects to continue partnering with the Nova Scotia Home Builders' Association to support energy efficiency practices within their member base.

Qualitative benefits of Regulatory Affairs include providing a fair and transparent process for stakeholders and Nova Scotians to offer input into DSM Resource Plans, programs, and investments.

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Request IR-3:

Reference: EfficiencyOne, Evidence - Page 46, Lines 18-20:

E1 states:

Dunsky's scan of North American jurisdictions revealed that over 80 percent have restricted their Performance Targets to include the metrics of energy savings and peak demand savings.

Please indicate which of these DSM providers operate under multi-year approval periods, and of those, which have mandatory performance requirements at the multi-year contract level rather than on an annual performance basis.

Response IR-3:

Mr. Dunsky provided the following response:

EfficiencyOne's Evidence references our Conclusion. The statement is based on the part of our report that included a high-level review of the 28 U.S. jurisdictions that have a performance incentive mechanism in place, as documented in a publicly-available report by the Edison Foundation

(see http://www.edisonfoundation.net/iei/Documents/IEE_StateRegulatoryFrame_0713.pdf).

The Edison report does not provide further information on whether those states operate under single or multi-year approval periods.

For the ten jurisdictions included in our detailed, case-by-case assessment, the following table indicates those that operate under an annual or multi-year Plan approval process, as well as, to the best of our knowledge, whether their performance indicators are evaluated at the multi-year contract level or on an annual basis.

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1

	APPROVAL TIMEFRAME		PERFORMANCE TIMEFRAME	
Jurisdiction	Annual Approval	Multi-year Approval	Annual Performance Target	Multi-year Performance Target
Vermont		✓		✓
District of Columbia	✓		✓	
Massachusetts		✓	✓	
Hawaii	✓		✓	
Oregon	✓		✓	
Ontario		✓		✓
Ohio		✓		✓
California		✓		
New York		✓	✓	
Wisconsin		✓		✓

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Request IR-4:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan – Page 13:

E1 has proposed a DSM plan for the 2016-2018 contract period on the basis that these investments are needed today to transform the market and yield long term savings.

(a) Please explain E1's definition of market transformation.

(b) Please provide the indicators E1 is planning to use to track the progress of market transformation.

(c) On what basis does E1 assert that the Nova Scotia market is large enough to be a factor in transforming the market for higher-risk measures?

Response IR-4:

a) As market transformation is a standard industry term, ENS does not have its own definition. According to the American Council for an Energy Efficient Economy (ACEEE):

The term *market transformation* is the strategic process of intervening in a market to create lasting change in market behavior by removing identified barriers or exploiting opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice.¹

¹ *Market Transformation*. Retrieved from ACEEE website: <http://aceee.org/portal/market-transformation>. Retrieved March 21, 2015.

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1 b) ENS gathers insights on the status of market transformation from a variety of activities.

2 These include:

3 • Research, such as:

4 ○ Residential and BNI customer motivations and barriers;

5 ○ Socket studies;

6 ○ Technology assessments.

7 • Process and impact evaluations, which include:

8 ○ Lighting replacement behaviours;

9 ○ Surveys of customer motivations and behaviours;

10 ○ Free ridership surveys;

11 • Tracking of the uptake of emerging technologies, such as LED lighting, through
12 programs.

13 • Interaction between ENS and the industry, such as:

14 ○ The electrical distribution community, through programs such as Business Energy
15 Rebates and Business Energy Solutions;

16 ○ Retailers, through the Instant Savings program;

17 ○ The Nova Scotia Home Builders' Association, through the New Home
18 Construction program;

19 ○ Associations and other entities developing Codes and Standards at the provincial
20 and national levels.

22 c) Market size is not a determining factor in assessing the need for market transformation.

23 ENS does not assert any of its measures are high-risk.

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Request IR-5:

Reference: EfficiencyOne, Evidence – Page 39, Lines 14-15:

E1 states:

The 2016-2018 DSM Resource Plan is cost effective, per legislative and UARB requirements for DSM.

(a) Does E1’s definition of DSM being “cost-effective” include analysis of the RIM test?

(b) Does E1 calculate the RIM test ratios for its programs?

(c) Please reproduce Figures 3.1 through 3.4 by adding a column with RIM test results.

Response IR-5:

a) No. The UARB has approved that DSM programs pass cost-effectiveness screening when they have a Total Resource Cost test ratio of 1.0 or greater.

b) Navigant’s DSM model has that capability.

c) Please refer to Figures 1 to 4 on the following page.

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1 Figure 1 - 2016-2018 DSM Resource Plan Investment and Savings

Year	Investment (\$ million)	Lifetime Benefits (\$ million) ^a	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Total Resource Cost Test (TRC) ^b	Program Administrator Cost Test (PAC) ^c	Ratepayer Impact Measure Test (RIM) ^d
2016	38.5	127.3	133.1	20.4	1.9	3.6	0.5
2017	40.3	139.8	136.5	21.0	2.0	3.8	0.5
2018	42.6	150.5	136.3	21.0	2.1	3.9	0.5
Total	121.5	417.5	405.9	62.5	2.0	3.8	0.5

Currency is expressed in 2016 dollars. Columns may not add correctly, due to rounding.

Annual avoided costs, calculated using ENSC's DSM Potential Study at the Base Level, were provided by NS Power. They include the cost of energy and capacity.

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

b TRC is a benefit/cost ratio comparing lifetime benefits to the sum of ENS's and participants' costs.

c PAC is a benefit/cost ratio comparing lifetime benefits to ENS's costs.

d RIM is a benefit/cost ratio comparing lifetime benefits to ENS's costs and NSPI lost revenues.

2

3 Figure 2 - 2016 DSM Resource Plan Investment and Savings

2016	Investment (\$ million)	Lifetime Benefits (\$ million) ^a	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Total Resource Cost Test (TRC) ^b	Program Administrator Cost Test (PAC) ^c	Ratepayer Impact Measure Test (RIM) ^d
Residential DSM Programs							
Efficient Product Rebates	2.5	6.6	11.0	1.1	1.6	2.7	0.4
Existing Residential	12.0	50.9	41.0	7.5	1.8	4.3	0.5
Low Income Participation ^e	2.0		7.8	1.0			
New Residential	1.7	6.7	3.5	1.0	2.5	3.9	0.5
Business, Nonprofit and Institutional Programs							
Efficient Product Rebates	6.7	23.8	34.1	5.3	2.0	3.5	0.5
Custom Incentives	8.2	32.0	34.0	4.2	2.5	3.9	0.5
Direct Installation	4.2	7.3	9.5	1.3	1.0	1.8	0.4
Enabling Strategies							
Education and Outreach	1.6						
Development and Research	1.1						
Other Enabling Strategies	0.6						
Total	38.5	127.3	133.1	20.4	1.9	3.6	0.5

Currency is expressed in 2016 dollars. Columns may not add correctly, due to rounding.

Annual avoided costs, calculated using ENSC's DSM Potential Study at the Base Level, were provided by NS Power. They include the cost of energy and capacity.

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

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b TRC is a benefit/cost ratio comparing lifetime benefits to the sum of ENS's and participants' costs.

c PAC is a benefit/cost ratio comparing lifetime benefits to ENS's costs.

d RIM is a benefit/cost ratio comparing lifetime benefits to ENS's costs and NSPI lost revenues.

e Reflects ENS's planned participation by low income customers, per the 2015 DSM Resource Plan Settlement Agreement.

Numbers are a subset of Existing Residential.

1

2 **Figure 3 - 2017 DSM Resource Plan Investment and Savings**

2017	Investment (\$ million)	Lifetime Benefits (\$ million) ^a	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Total Resource Cost Test (TRC) ^b	Program Administrator Cost Test (PAC) ^c	Ratepayer Impact Measure Test (RIM) ^d
Residential DSM Programs							
Efficient Product Rebates	2.7	7.3	12.0	1.1	1.7	2.8	0.4
Existing Residential	13.6	58.3	44.2	8.0	1.9	4.3	0.5
Low Income Participation ^e	2.3		8.2	1.1			
New Residential	1.8	7.2	3.6	1.0	2.6	4.1	0.5
Business, Nonprofit and Institutional Programs							
Efficient Product Rebates	6.5	25.4	33.6	5.4	2.2	3.9	0.5
Custom Incentives	8.2	33.9	34.1	4.3	2.7	4.1	0.5
Direct Installation	4.0	7.5	9.0	1.2	1.1	1.9	0.4
Enabling Strategies							
Education and Outreach	1.7						
Development and Research	1.2						
Other Enabling Strategies	0.7						
Total	40.3	139.8	136.5	21.0	2.0	3.8	0.5

Currency is expressed in 2016 dollars. Columns may not add correctly, due to rounding.

Annual avoided costs, calculated using ENSC's DSM Potential Study at the Base Level, were provided by NS Power. They include the cost of energy and capacity.

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

b TRC is a benefit/cost ratio comparing lifetime benefits to the sum of ENS's and participants' costs.

c PAC is a benefit/cost ratio comparing lifetime benefits to ENS's costs.

d RIM is a benefit/cost ratio comparing lifetime benefits to ENS's costs and NSPI lost revenues.

e Reflects ENS's planned participation by low income customers, per the 2015 DSM Resource Plan Settlement Agreement.

Numbers are a subset of Existing Residential.

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Figure 4 - 2018 DSM Resource Plan Investment and Saving

2018	Investment (\$ million)	Lifetime Benefits (\$ million) ^a	Incremental Annual Net Energy Savings at Generator (GWh)	Incremental Annual Net Demand Savings at Generator (MW)	Total Resource Cost Test (TRC) ^b	Program Administrator Cost Test (PAC) ^c	Ratepayer Impact Measure Test (RIM) ^d
Residential DSM Programs							
Efficient Product Rebates	2.7	7.9	12.2	1.1	1.8	2.9	0.4
Existing Residential	14.8	61.8	43.6	8.0	1.9	4.2	0.5
Low Income Participation ^e	2.6		7.7	1.0			
New Residential	1.8	7.8	3.7	1.1	2.8	4.3	0.5
Business, Nonprofit and Institutional Programs							
Efficient Product Rebates	7.0	28.9	33.6	5.3	2.2	4.1	0.5
Custom Incentives	8.3	36.4	34.4	4.3	2.9	4.4	0.5
Direct Installation	3.9	7.7	8.6	1.2	1.1	2.0	0.4
Enabling Strategies							
Education and Outreach	1.8						
Development and Research	1.3						
Other Enabling Strategies	0.9						
Total	42.6	150.5	136.3	21.0	2.1	3.9	0.5

Currency is expressed in 2016 dollars. Columns may not add correctly, due to rounding.

Annual avoided costs, calculated using ENSC's DSM Potential Study at the Base Level, were provided by NS Power. They include the cost of energy and capacity.

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

b TRC is a benefit/cost ratio comparing lifetime benefits to the sum of ENS's and participants' costs.

c PAC is a benefit/cost ratio comparing lifetime benefits to ENS's costs.

d RIM is a benefit/cost ratio comparing lifetime benefits to ENS's costs and NSPI lost revenues.

e Reflects ENS's planned participation by low income customers, per the 2015 DSM Resource Plan Settlement Agreement. Numbers are a subset of Existing Residential.

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Request IR-6:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan – Page 14, Lines 5-8 (Custom Program):

E1 states:

The program is designed to accommodate a wide range of customer requirements. Delivery of the program is structured so customers may participate by incorporating energy-efficient options or designs at any phase of their project, regardless of their current level of energy management expertise.

(a) Given such program design, please explain how you screen for free ridership.

(b) Please explain the breadth of the program and how it compares to the programs being carried out in other jurisdictions in Canada, citing the specific jurisdictions.

Response IR-6:

a) The Custom program allows participants to enter at any phase of a project prior to completion. For example, a customer may have had a feasibility study completed outside of the program, but cannot proceed with the energy efficiency portion of the project because of a financial barrier, such as insufficient capital. As this barrier prevents implementation of the energy-efficient upgrades, the customer could become a participant partway through the project and would not be considered a free rider.

Free-ridership screening for the Custom program is completed by EfficiencyOne's staff on a project-by-project basis. Prior to receiving support from the program, potential

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participants provide responses to a series of questions designed to screen for free-ridership. These questions focus on topics such as:

- Impact of potential incentives on the decision-making process, by identifying the required simple payback or internal rate of return for energy efficiency investments;
- Declaration of financial support for the project from other sources (e.g., tax incentives);
- Planned timelines for upgrades and/or retirement of the affected equipment;
- Impact of ENS's technical support or partnership on the decision to implement the project; and
- Whether the project would have proceeded without feasibility study funding.

The third party evaluator also conducts interviews with a sample of participants to assess free-ridership. During the impact evaluation, the assessed level of free-ridership is applied across the program or the selected measure/participant category.

b) By design, the Custom program supports a broad range of non-prescriptive measures and complex projects that are not typically supported through other programs. This is typical of the approach used in other jurisdictions. Due to the inherent flexibility of the Custom program, participants from all BNI rate classes could be eligible to participate, provided the measures will achieve cost effective electrical energy savings. Examples of Custom programs offered in other Canadian jurisdictions include the following:

- Newfoundland & Labrador: takeCharge Custom Program
(<http://takechargenl.ca/business/custom/>)
- Ontario: SaveonEnergy Custom Incentives
(<https://www.saveonenergy.ca/Business/Program-Overviews/Retrofit-for-Commercial/Available-Incentives/Custom.aspx>)
- Manitoba: Manitoba Hydro Commercial Custom Measures
(https://www.hydro.mb.ca/your_business/custom_measures/index.shtml)
- British Columbia: BCHydro Power Smart Partner Program
(<http://www.bchydro.com/powersmart/business/programs/partners.html>)

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- 1 • Northwest Territories: Arctic Energy Alliance Commercial Energy Conservation and
- 2 Efficiency Program
- 3 (<http://aea.nt.ca/programs/commercial-energy-conservation-and-efficiency-program>)

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Request IR-7:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan - Page 24, Lines 7-8:

E1 states:

ENS recognizes a lack of upfront capital can be a barrier to customers adopting energy efficiency measures.

(a) Please provide statistics for the most recent historical year available for each of E1's residential programs, which provides the number of participants and savings levels broken out by income level categories.

(b) Does E1 verify household income levels prior to awarding subsidies? If not, why not.

Response IR-7:

a) Aside from the Low Income Homeowner Service offered by ENSC prior to 2015, ENS does not collect income levels for households participating in its DSM programs.

b) No. Independent evaluation of free ridership quantifies the effectiveness of incentives, rebates and other program support in overcoming all participation barriers, including financial. Because free ridership is independently evaluated for all DSM programs administered by ENS, knowledge of participants' income levels is not required in order to confirm cost effectiveness and impact.

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Request IR-8:

Reference: EfficiencyOne, Evidence - Page 39, Line 19:

E1 states that it has proposed a plan that is based on lower unit costs than prior proposed plans, and that it has done so for “multiple reasons.” Please provide and elaborate on these “multiple reasons”, providing comparisons in a table with the reason(s) cited for each.

Response IR-8:

The table below compares the first-year unit costs of each DSM Plan filed by ENSC or EfficiencyOne.

Plan Year	2012	2013	2014	2015	2016	2017	2018	2016-2018 Average
Proposed Unit Cost	\$0.35	\$0.34	\$0.35	\$0.32	\$0.29	\$0.30	\$0.31	\$0.30

The 2016-2018 DSM Resource Plan has lower unit costs for the following reasons:

- **Short-Term Affordability:** The proposed 2016-2018 DSM Resource Plan incorporates the following:
 - Removal of the Home Energy Report from the program portfolio, which was the highest lifetime unit-cost program in ENS’s portfolio;
 - Reduction of the total three-year Enabling Strategies investment by \$4.3 million compared to the 2013-2015 DSM Plan;
 - A greater emphasis on lower-unit-cost programs than in the 2015 Plan:
 - The Existing Residential program makes up a greater percentage of the Residential energy-savings target in 2016-2018 than was proposed in 2015.
 - In 2016-2018, Efficient Products (BNI) and Custom Incentives make up a greater percentage of the BNI energy-savings target than was proposed in 2015.

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- The Direct Installation program makes up a lower percentage of the BNI energy-savings target in 2016-2018 than was proposed in 2015.

- **Additional Experience Built into Modeling Assumptions:** The proposed 2016-2018 DSM Resource Plan incorporates an investment level equivalent to the Low-DSM scenario of ENSC's DSM Potential Study, reducing short-term costs to ratepayers by \$27.9 million compared to ENS's initial modeling, while achieving 405.9 GWh over three years. The last modeled Plan proposed by ENSC (2013-2015) was built in 2011: ENSC had not yet completed one full year of DSM administration. With full-year results for 2011-2013 and partial results for 2014, this experience of achievable unit costs and cost efficiencies were applied in the development of the 2016-2018 DSM Resource Plan.
- **Low Income Homeowner program removed:** NS Power's charitable contribution commitment to provide free energy efficiency improvements for low income electric-heat homeowners has resulted in the removal of a high unit cost program from the DSM portfolio.

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Request IR-9:

Reference: EfficiencyOne, Evidence - Page 56, Lines 12-15:

(a) Please provide in list form the measures and their associated TRCs for measures having a TRC<1.5. Please group by program and by sub-component.

(b) Describe by measure the “strategic or long-term benefits” including “economies of scale” that E1 anticipates would ensue from the inclusion of measures with a TRC<1 in the proposed 2016-2018 DSM Resource Plan.

Response IR-9:

a) ENS is providing all measures included in its proposed Plan, organized within program component grouping by TRC results, for the following reasons:

- DSM offerings are screened at the program level;
- Programs are considered to have passed cost-effectiveness screening tests with a minimum TRC value of 1.0, not 1.5; and
- By UARB approval, as long as the overall program passes, programs may include individual measures with a TRC value below 1.0.

Please refer to EfficiencyOne’s response to NSPI IR-10 Attachment 1, filed electronically, which includes the requested information in the following columns:

- **Measure Name:** Column A
- **TRC Test Ratio:** Column O
- **Program:** Column U
- **Program Component:** Column V

b) Please refer to Attachment 1. Measure counts are outputs from 2016-2018 DSM Resource Plan modelling; they are not “anticipated” counts of measure uptake. ENS

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1 offers DSM programs, each of which includes measure options from which participants
2 are able to select the options that meet their needs or preferences. ENS does not forecast
3 specific measure numbers to be implemented in each year.

Measure Data for Measures Having a TRC Less Than One			
Measure	Description/Rationale	Program	EL-RAM 2016-2018 Measure Count
Daylighting Controls	Daylighting controls are an emerging market for retrofit opportunities within existing commercial buildings. As Nova Scotia installers gain experience with installation, installation costs are expected to decrease.	Efficient Product Rebates (BNI)	2,320
ENERGY STAR® Self Contained Ice Maker	ENERGY STAR® appliances, such as self-contained ice makers, for restaurants and commercial foodservice provide an entry-point for these clients to be introduced to a recognizable energy efficiency brand, which is important for gaining subsequent participation. ENS offers a full suite of commercial ENERGY STAR® electric appliances, which is a strategic advantage for garnering market interest. Altering this full suite would result in a strategic disadvantage in the market.	Efficient Product Rebates (BNI)	8
LED Low Bay Fixture	Purpose-built LED Low Bay fixtures are in their infancy in the North American market. Material costs are decreasing over time. Some of this decrease can be attributed to the efforts of North American DSM jurisdictions supporting these products as a standard offering. ENS is one such jurisdiction.	Efficient Product Rebates (BNI)	48,468
LED Refrigeration Strip Lighting-End of Life Replacement	This measure serves to augment other energy efficiency measures offered for grocers. Grocers have expressed interest in ENS supporting this measure for supermarkets. It provides a strategic advantage for garnering market interest from this industry segment.	Efficient Product Rebates (BNI)	1,576
Ground Source Heat Pump	Ground source heat pumps have varying capital costs depending on installation site. Installation capacity and skills in Nova Scotia for ground source heat pumps are low, driving higher installation costs, which are a large percentage of total capital costs for these systems. ENS expects that by supporting and promoting these technologies, installation costs will decrease and make more systems cost-effective. Increased competition in the installation market, as well as reduced labour costs are expected to enable this. It should be noted that installation costs are regionally dependent, making such a decrease feasible.	Direct Installation (BNI)	848
		Existing Residential	261
Night Covers for 3' Refrigerated Display Cases-BES	This measure augments other energy efficiency measures offered for grocers. Grocers have expressed interest in ENS supporting this measure for supermarkets. It provides a strategic advantage for garnering market interest from this industry segment.	Direct Installation (BNI)	1,278
Room A/C Retirement	Room air conditioner retirements complement refrigerator retirements and achieve economies of scale through multiple appliance pickups. Room air conditioner units are only retired in combination with an eligible fridge or freezer. Excluding these measures from Appliance Retirement would result in lost opportunity for non-discretionary retirements (e.g. new appliance purchases).	Efficient Product Rebates (Residential)	38
Freezer Retirement	Freezer retirements complement refrigerator retirements and achieve economies of scale through multiple appliance pickups for a single truck deployment. Excluding these measures from Appliance Retirement would result in lost opportunity for non-discretionary retirements (e.g. new appliance purchases).	Efficient Product Rebates (Residential)	10,485
Hardwired Dimmer Switch	This product broadens Efficient Products offerings for consumers. As more of these products are purchased by Instant Savings participants, it is expected that TRC ratios will improve due to fixed costs, such as marketing and signage, being better distributed.	Efficient Product Rebates (Residential)	29,675
ENERGY STAR® Door	Doors are a highly desired retrofit option for Nova Scotian homeowners, despite having lower TRC values than other residential building envelope improvements. These measures are supported to leverage customer demand, allowing ENS to cross-promote other building envelope measures during the same retrofit cycle.	Existing Residential	4,510

Measure Data for Measures Having a TRC Less Than One			
Measure	Description/Rationale	Program	EL-RAM 2016-2018 Measure Count
ENERGY STAR® Windows (300 ft2) (Replace Double Pane)	Windows are a highly desired retrofit option for Nova Scotian homeowners, despite having lower TRC values than other residential building envelope improvements. These measures are supported to leverage customer demand, allowing ENS to cross-promote other building envelope measures during the same retrofit cycle.	Existing Residential	1,975
ENERGY STAR® Air Source Heat Pump	Inclusion of this measure supports a full suite of offerings for the Green Heat program component. This energy efficiency option is the one of the few available for customers with electric furnaces.	Existing Residential	296
Programmable Electronic Thermostat (Baseboard)	Thermostat options are important for obtaining energy savings for the hard-to-reach market of rental tenants. This measure complements other Multi-Unit Residential Building offerings.	Existing Residential	47
12 W LED (MURB only)	LED options assist in achieving energy savings for the hard-to-reach market of rental tenants. This measure complements other Multi-Unit Residential Building offerings.	Existing Residential	2,179
Solar DHW	Solar domestic hot water technologies have significant material and installation capital costs. Local production and installers provide the potential for reduced costs with increased installation rates in the medium to long term. This is expected to occur via increased competition in the market, as well as reduced labour costs, as Nova Scotia represents a significant portion of the local market.	Existing Residential	1,876
		New Residential	1
Solar Space and Water Heat (Supplement Electricity)	Solar hot water technologies have both significant material and installation capital costs. Local production and installers provide the potential for reduced costs with increased installation rates in the medium to long term. This is expected to occur via increased competition in the market, as well as reduced labour costs, as Nova Scotia represents a significant portion of the local market.	Existing Residential	449
		New Residential	1
Intelligent Thermostat	Thermostat options are important for obtaining energy savings for the hard-to-reach market of rental tenants. This measure complements other Multi-Unit Residential Building offerings.	Existing Residential	73
Solar Space Heating (Displacing Electricity)	Solar technologies have both significant material and installation capital costs. Local production and installers provide the potential for reduced costs with increased installation rates in the medium to long term. This is expected to occur via increased competition in the market, as well as reduced labour costs, as Nova Scotia represents a significant portion of the local market.	New Residential	465
Indoor Motion Sensor	This product broadens Efficient Products offerings for consumers. As more of these products are purchased by Instant Savings participants, it is expected that TRC ratios will improve due to greater distribution of fixed costs such as marketing and signage.	Efficient Product Rebates (Residential)	24,990
Smartstrip	This product broadens Efficient Products offerings for consumers. As more of these products are purchased by Instant Savings participants, it is expected that TRC ratios will improve due to greater distribution of fixed costs such as marketing and signage.	Efficient Product Rebates (Residential)	20,578

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Request IR-10:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan:

Please provide, with formulas intact, in the form outlined in the spreadsheet attached hereto as Attachment 1, the technical tables, at the measure level, for the proposed 2016-18 DSM Resource Plan attached as Appendix “A.”

Response IR-10:

Please refer to Attachment 1, filed electronically. ENS added one column (BK) to the end of NSPI’s spreadsheet to provide a response to NSPI IR-12 g) iv) in a consolidated form.

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Request IR-11:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan - Page 1, Lines 23-24:

E1 states:

The Plan addresses affordability by balancing multiple short- and long-term considerations, including bill impacts, rate impacts, and long-term planning analyses.

Please provide a detailed description and any supporting analyses that demonstrated how this balancing was conducted, including, but not limited to:

- (a) Identification of different levels of short-term and long-term cost that were considered;**
- (b) Identification of different bill impacts that were considered;**
- (c) Identification of different rate impacts that were considered;**
- (d) The use of any long-term planning analyses that were considered; and,**
- (e) The relative weights of items (a) through (d) in the balancing process.**

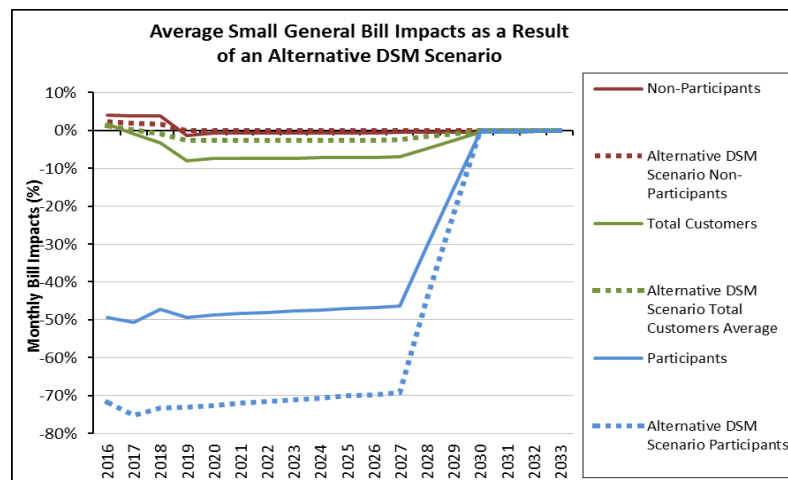
Response IR-11:

- a) Please refer to EfficiencyOne's Application Evidence, pages 31-37.**

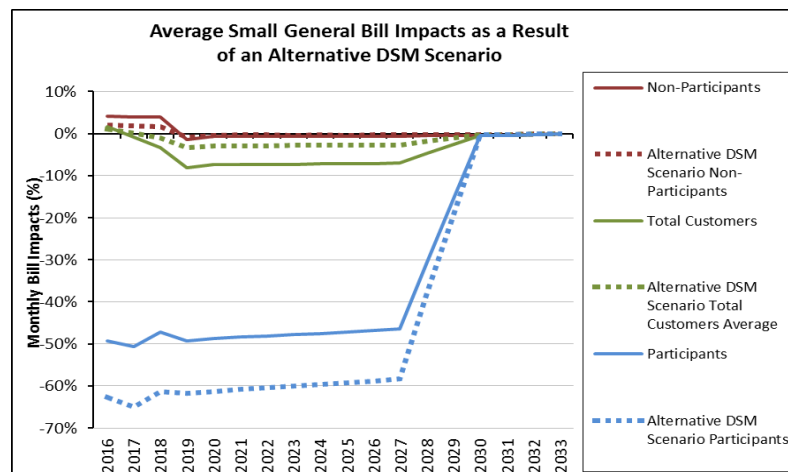
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b) As shown in ENS's rate and bill impact analysis, for total customers in every rate class, average bills are increased in a 50% Low and Low-DSM Scenario and are decreased in a Mid-DSM Scenario when compared against ENS's proposed Plan. In other words, greater investment in DSM reduces bills for Nova Scotians on average, and less investment in DSM increases them. An example from the Small General rate class tables is provided below: total customers results are indicated by the green lines.

50% Low DSM Scenario

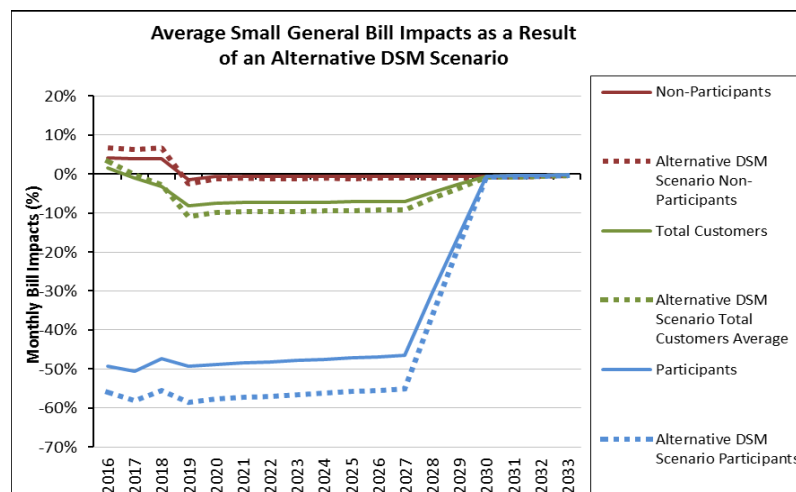


Low-DSM Scenario



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Mid-DSM Scenario



For clarification, the reason that participants' (the blue lines) bills are reduced in all scenarios is because of the assumptions used in ENS's rate and bill impact model. The model incorporates an assumption that 75 percent of a change in energy savings resulting from alternative scenarios is due to a change in the number of participants, and 25 percent is due to a change in energy savings by existing participants. For example, when investment is increased, as it is in the Mid-DSM Scenario, the model's assumption is that 75 percent of the increase in energy savings is attributed to an increase in the number of participants and 25 percent of the increase in energy savings is attributed to more energy savings by existing participants. When investment is reduced, the number of participants is reduced to a greater extent than the energy savings per participant. For example, in the 50% Low-DSM Scenario, there are 72 percent fewer participants than in the Base Scenario, but energy savings are only reduced by 62 percent. This means there is "leftover" energy savings achieved that cannot be allocated to new participants. They are therefore allocated to the remaining participants, resulting in additional energy savings per participant.

Since NSPI has not filed its proposed cost allocation methodology, the existing UARB-approved cost allocation methodology has been used; if the methodology changes, the

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1 general trends would be expected to remain the same but specific values or percentages
2 may change.

3
4 For all rate-class specific results, please refer to the Application, Appendix D,
5 Attachment 3. The third set of tables for each rate class includes “Rate and Bill Impacts
6 of Alternate DSM Scenarios.”

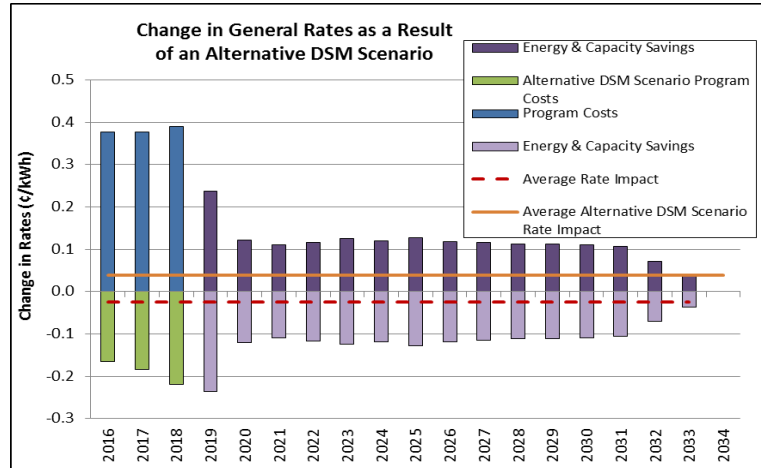
7
8 c) As shown in ENS’s rate and bill impact analysis, in general, rates increase in the near
9 term when DSM investment is increased and decrease in the near term when DSM
10 investment is decreased. However, on average, over the lifetime of the DSM program
11 benefits, the results are different:

- 12 • Rates, on average over the lifetime of the energy savings, increase in a 50% Low-
13 DSM Scenario for all analyzed rate classes when compared against ENS’s proposed
14 Plan.
- 15 • Rates, on average over the lifetime of the energy savings, decrease in a Low-DSM
16 Scenario when compared against ENS’s proposed Plan for all rate classes except the
17 General and the three Industrial classes.
- 18 • Rates, on average over the lifetime of the energy savings, decrease in a Mid-DSM
19 Scenario when compared against ENS’s proposed Plan for all rate classes except the
20 Small General and the Municipal classes.

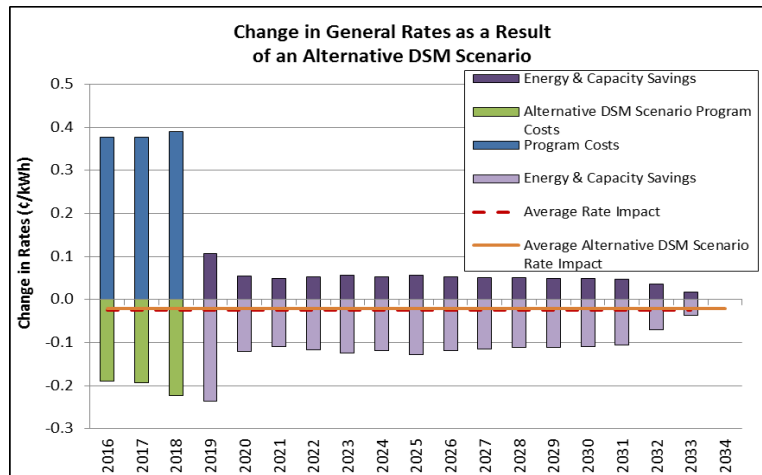
21
22 An example from the General rate class tables is provided below. The orange line is the
23 average rate impact of the alternative scenario; the red dashed line is the impact of ENS’s
24 proposed Plan.

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50% Low DSM Scenario

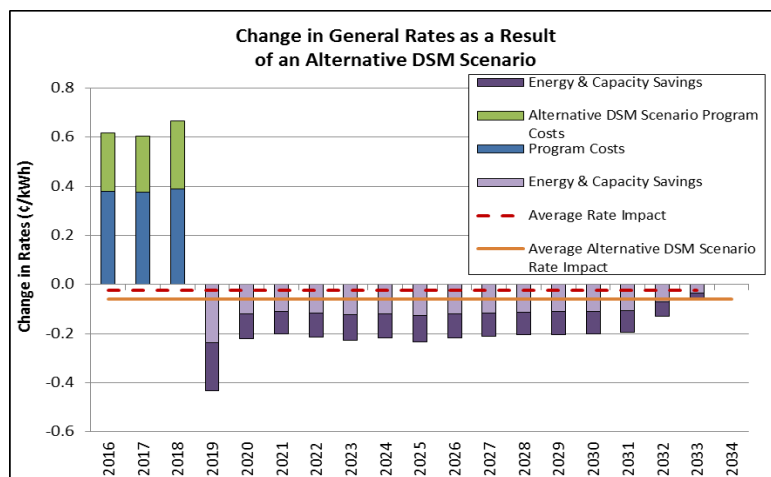


Low-DSM Scenario



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Mid-DSM Scenario



These results are dependent on the cost-allocation methodology approved for the 2016-2018 years. Rate impacts by class are affected to a greater extent than bill impacts, since the additional factor of energy savings is not included in the rates portion of the analysis. Since NSPI has not its proposed cost allocation methodology, the existing UARB-approved cost allocation methodology has been used: if the methodology changes, the results of the analysis would be expected to change.

For all rate-class specific results, please refer to the Application, Appendix D, Attachment 3. The third set of tables for each rate class includes “Rate and Bill Impacts of Alternate DSM Scenarios.”

d) Please refer to the Application Evidence, pages 27-30.

e) ENS has not assigned specific weightings to the considerations outlined in parts a) through d) in the development of its balanced approach. Dunskey Energy Consulting’s memo, “DSM Portfolio Design Principles and Considerations” provides advice by stating:

In other words, as with so many activities, a DSM Program Administrator’s portfolio should seek to balance multiple goals, which form the basis of guiding

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1 principles. This need not imply *equal* weighting of each goal, but explicit
2 *consideration* of each. (Appendix F, page 1)

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Request IR-12:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan, Figures 1.2, 1.3, and 1.4:

Please provide the following:

- (a) A list of all energy efficiency measures considered by E1 but not included in the programs represented by these tables. For any such measure, please provide all analysis conducted with respect to such measure.**
- (b) A list of all energy efficiency programs considered by E1 but not included in the programs represented by these tables. For any such program, please provide all analysis conducted with respect to such program.**
- (c) Any analysis considered by E1 that included different levels of expenditures and/or energy savings for any of the programs, including both those programs listed in these tables and any other programs considered by E1.**
- (d) For each program, please explain why E1 believes that the level of expenditure on that program shown in these tables is more appropriate than other spending levels. Provide all supporting analyses.**
- (e) Please indicate if E1 considered equity between customer classes in the development of its recommended portfolio. If “yes”, please provide a detailed description of how equity between customer classes was considered.**
- (f) Please indicate if E1 considered equity between participants and non-participants in the development of its recommended portfolio. If “yes”, please provide a detailed**

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1 **description of how equity between participants and non-participants was**
2 **considered.**

3
4 **(g) Please identify/provide for each program:**

5
6 **(i) All energy efficiency measures eligible to for inclusion in the program,**
7 **including a statement of the assumed baseline and efficiency level of the**
8 **measure;**

9
10 **(ii) A count of the anticipated participation by measure by year;**

11
12 **(iii) The TRC, PAC and RIM ratios of that measure, using just the measure**
13 **incremental measure cost (i.e., without consideration of program**
14 **implementation costs and net-to-gross ratio);**

15
16 **(iv) The incentive to be paid for that measure, along with the rationale, and**
17 **supporting analysis with respect to the chosen incentive level;**

18
19 **(v) The assumed net-to-gross ratio for that measure;**

20
21 **(vi) If any program includes any measure that has a TRC measure benefit cost**
22 **ratio of less than 1.0, please provide a detailed description of the rationale for**
23 **including that measure, along with a count of the number of such measures**
24 **anticipated to be included in the program over the 2016-2018 time period;**

25
26 **(vii) The assumed net-to-gross ratio for the program, along with any evidence**
27 **supporting the use of that assumed net-to-gross ratio;**

28
29 **(viii) A breakdown of the program implementation budget by year, separately**
30 **identifying incentive and non-incentive costs. Provide any supporting**

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analysis used to help determine the appropriate level of non-incentive program implementation cost by year;

(ix) A detailed breakdown of the program non-incentive budget by year;

(x) A detailed description of the methodology used to estimate participation rates in each year.

Response IR-12:

a) Please refer to the table below.

Measure	Analysis
13 W CFL	Not included due to updated lighting regulations.
14 W Dimmable CFL	Not included due to updated lighting regulations.
23 W CFL	Not included due to updated lighting regulations.
CEE Tier 3 Clothes Washer	Removed due to current expectations of 2016-2018 program planning.
CEE Tier 3 Freezers	Removed due to current expectations of 2016-2018 program planning.
CEE Tier 3 Refrigerator	Removed due to current expectations of 2016-2018 program planning.
Electric Thermal Storage	Part of Demand Response Program. Please refer to part c).
ENERGY STAR® Air to Water Heat Pump	Removed due to current expectations of 2016-2018 program planning.
Energy Star® Regular CFL	Not included due to updated lighting regulations.
Energy Star® Specialty CFL	Not included due to updated lighting regulations.
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	Removed due to current expectations of 2016-2018 program planning.

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Measure	Analysis
Heat & Power Load Control	Part of Demand Response Program. Please refer to part c).
Home Energy Report	Program removed. Please refer to part c).
Nest Thermostat	Removed due to current expectations of 2016-2018 program planning.
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	No strategic rationale for inclusion.
Outside Air Economizer For Walk-In Cooler	Removed due to ENSC history of very low measure uptake.
Outside Air Economizer For Walk-In Cooler-BES	Removed due to ENSC history of very low measure uptake.

b) Please refer to part c).

c) ENS conducts its program-level analyses once assessment of the general direction and parameters of a DSM Resource Plan is complete. For 2016-2018, Plan-level parameters were a balance of short-term and long-term considerations, resulting initially in a high-\$40 million to low-\$50 million plan (this initial plan will be referred to as the \$50 million plan for the remainder of this IR response). Subsequently, based on discussions with NSPI, and in consideration of system requirements and short-term affordability, ENS developed its proposed DSM Resource Plan at a lower investment level.

Ongoing refinement of assumptions and inputs into the EL-RAM (such as achievable potential, market conditions, avoided costs, and historical results) provided variations in program-level investment and/or energy savings within an overall portfolio structure for ENS to analyze. Accordingly, few programs were individually analyzed outside of ENS's portfolio-level analysis, which focused on a balanced portfolio. Programs that received individual analysis are provided below.

Energy Savings Actions: The Home Energy Report, the only component within Energy Savings Actions, was included in ENS's original \$50 million plan. In its consideration of

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1 a lower investment level, ENS removed the program from the Plan, as, based on a one-
2 year measure life, it has the highest lifetime unit cost in ENS's portfolio. Removing this
3 program did not affect local industry capacity, as it is a service offered by a delivery
4 agent based outside of the province.

5
6 **Demand Response (Residential):** At NSPI's request, ENS and Navigant modelled
7 demand response measures in the EL-RAM, using information provided by NSPI.
8 Outputs were included in ENS's original \$50 million plan, which included initial results
9 only. Since ENS has not conducted research into the development of a demand-response
10 program, it did not have data or evidence on which to build assumptions for a program
11 offered by ENS. The data used for the initial modelling was based on NSPI's existing
12 offerings, which could differ if ENS were to administer such a program. First-year unit
13 costs were also high, as demand response measures do not offer energy savings and may
14 not be justified when capacity is not required in the near term.

15
16 In addition to a lack of data on which to build assumptions for a program within a filed
17 DSM Resource Plan, ENS removed this program in its consideration of a lower DSM
18 Resource Plan level as demand response measures do not provide energy savings and do
19 not avoid capacity costs during the Plan period. As stated in the 2016-2018 DSM
20 Resource Plan, ENS expects to conduct research into demand-response and/or demand-
21 control options and pilot feasible options within the Existing Residential or New
22 Residential programs as applicable (Application, Appendix A, page 23, lines 5-7). Any
23 piloted measures would be subject to cost-effectiveness screening.

24
25 **Business Demand Response:** The Business Demand Response program was removed
26 for the same reasons provided for the Demand Response (Residential) program above. In
27 addition, ENS understands that Business Demand Response was a lower-priority focus
28 for NSPI, even if Demand Response was kept as a separate program rather than measures
29 within a program.

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Enabling Strategies: Enabling strategies build demand for, and support the long-term sustainability of, energy savings. When ENS reduced its proposed investment level from the \$50 million plan to the current proposed and filed Plan, it recognized reductions should not be limited to programs, and reduced its Enabling Strategies investment accordingly.

- d) Proposed program-level investments are outputs of the EL-RAM model. As different investments are considered at the plan level, individual program investment levels would be correspondingly different as a result of the EL-RAM model calculating different outputs. Outputs may change based on updated assumptions or inputs related to factors such as achievable potential, market conditions, avoided costs, and historical results. When changes or enhancements to the assumptions or inputs are required, they are incorporated within the EL-RAM to facilitate subsequent plan or Potential Study modelling.

At the portfolio level, ENS is proposing a level of DSM that it asserts to be appropriate given a number of considerations, including that all programs are cost-effective. Other considerations include ENS's ability to meet the IRP Preferred Resource Plan in the mid-to long-term, short-term affordability, and existing industry capacity. Please refer to EfficiencyOne's Application Evidence, pages 31-37 for details. Additional analysis includes the overall balance of ENS's proposed portfolio, provided that individual programs meet cost-effectiveness screening requirements. This analysis is provided in EfficiencyOne's Application Evidence, page 42, lines 17-23 and was informed by Dunskey Energy Consulting's memo, "DSM Portfolio Design Principles and Considerations", provided as Appendix F to EfficiencyOne's Application.

- e) Yes. Please refer to Appendix F, Dunskey Energy Consulting's memo "DSM Portfolio Design Principles and Considerations," which informed ESN's approach to overall portfolio offerings.

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f) Yes. As provided in Appendix F, Dunskey Energy Consulting's memo "DSM Portfolio Design Principles and Considerations," which informed ENS's approach to overall portfolio offerings, maximizing equity, or social license, is important in DSM offerings.

As Mr. Dunskey writes:

In the case of DSM, to which all customers are required to contribute, social license is generally obtained by ensuring that the vast majority of contributors also have an opportunity to benefit from programs. In other words, social license is viewed through the lens of providing broad, equitable access to program benefits.

In addition, ENS considered the points made by Tim Woolf of Synapse Energy Economics¹:

- DSM administrators should "Promote customer participation, to address equity concerns."
- Doing so is key to "drawing the right balance between rates and bills."
- "Program Administrators should actively pursue the non-participants and those who have not participated in a while."
- DSM administrators should "Increase budgets to increase participation," which "is the exact opposite of the typical response to rate impact concerns."

Please refer to Attachment 1 for Mr. Woolf's complete presentation.

g)

(i) The EL-RAM, which was used to develop Figures 1.2, 1.3, and 1.4 in Appendix A of the Application, incorporates the delta between baseline and efficient energy consumption (energy savings); it does not include separate baseline and efficiency values. Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1,

¹ Woolf, Tim. (2013). *Energy Efficiency: Rate, Bill and Participation Impacts*. Retrieved from <http://www.synapse-energy.com/sites/default/files/SynapsePresentation.2013-09.0.ACEEE-Conference-Impacts.S0074.pdf>

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1 filed electronically, for the energy savings values, which can be found in column
2 E (column 5 in the printed version).

3
4 (ii) ENS does not have estimated measure-level participation rates, and the EL-RAM,
5 which has been used to develop Figures 1.2, 1.3, and 1.4 of Appendix A of the
6 Application, does not include any modelling of participation rates.

7
8 (iii) TRC, PAC, and RIM ratios are screening tests used to evaluate demand-side
9 management measures, programs and portfolios. Removing net-to-gross ratio and
10 program administrator costs would result in ratios that can no longer be
11 considered TRC, PAC, and RIM ratios.

12
13 (iv) Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1, filed
14 electronically, for measure-level incentives modelled in the EL-RAM, which are
15 provided in column BK. The modelled incentive dollars provided reflect actual
16 2014 incentives; actual incentives may vary each year as new research and
17 evaluation results are completed.

18
19 (v) Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1, filed
20 electronically. Net-to-gross ratios are included in column N.

21
22 (vi) Please refer to EfficiencyOne's response to NSPI IR-9 b).

23
24 (vii) Net-to-gross ratios are not calculated at the program level in the EL-RAM, which
25 was used to develop Figures 1.2, 1.3, and 1.4 in Appendix A of the Application.

26
27 (viii) As with prior DSM and DSM Resource Plans, EfficiencyOne has presented a
28 high-level planning proposal in its Application. The 2016-2018 DSM Resource
29 Plan is not an implementation plan; detailed program budgets have not yet been
30 developed.

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1

2 (ix) Please refer to part g) viii).

3

4 (x) Please refer to part g) ii).



Synapse
Energy Economics, Inc.

Energy Efficiency: Rate, Bill and Participation Impacts

**American Council for an Energy Efficient Economy
Energy Efficiency as a Resource Conference**

September 24, 2013

Tim Woolf

Rate Impacts of Energy Efficiency Programs

- Concerns about rate impacts are possibly the biggest barrier to expanding efficiency activities.
- The standard response to rate impact concerns:
 - Rates go up, but average bills go down.
 - On average customers are better off.
- This response is not sufficient.
 - Program participants see higher rates but lower bills.
 - Non-participants see just higher rates.
- There is a widely-held belief that only a small minority of customers participate in efficiency programs.
- Rate & bill impacts are a matter of customer equity.

Addressing Customer Equity

- Program participation rates:
 - Typically not well understood or analyzed.
 - Are the key to drawing the right balance between rates and bills.
 - Can and should be addressed through regulatory policies.
- Big picture recommendations:
 - Analyze rate, bill and participation impacts, in order to fully understand what the impacts are;
 - Manage rate, bill and participation impacts, in order to achieve energy goals and optimize benefits to all customers; and
 - Promote customer participation, to address equity concerns.

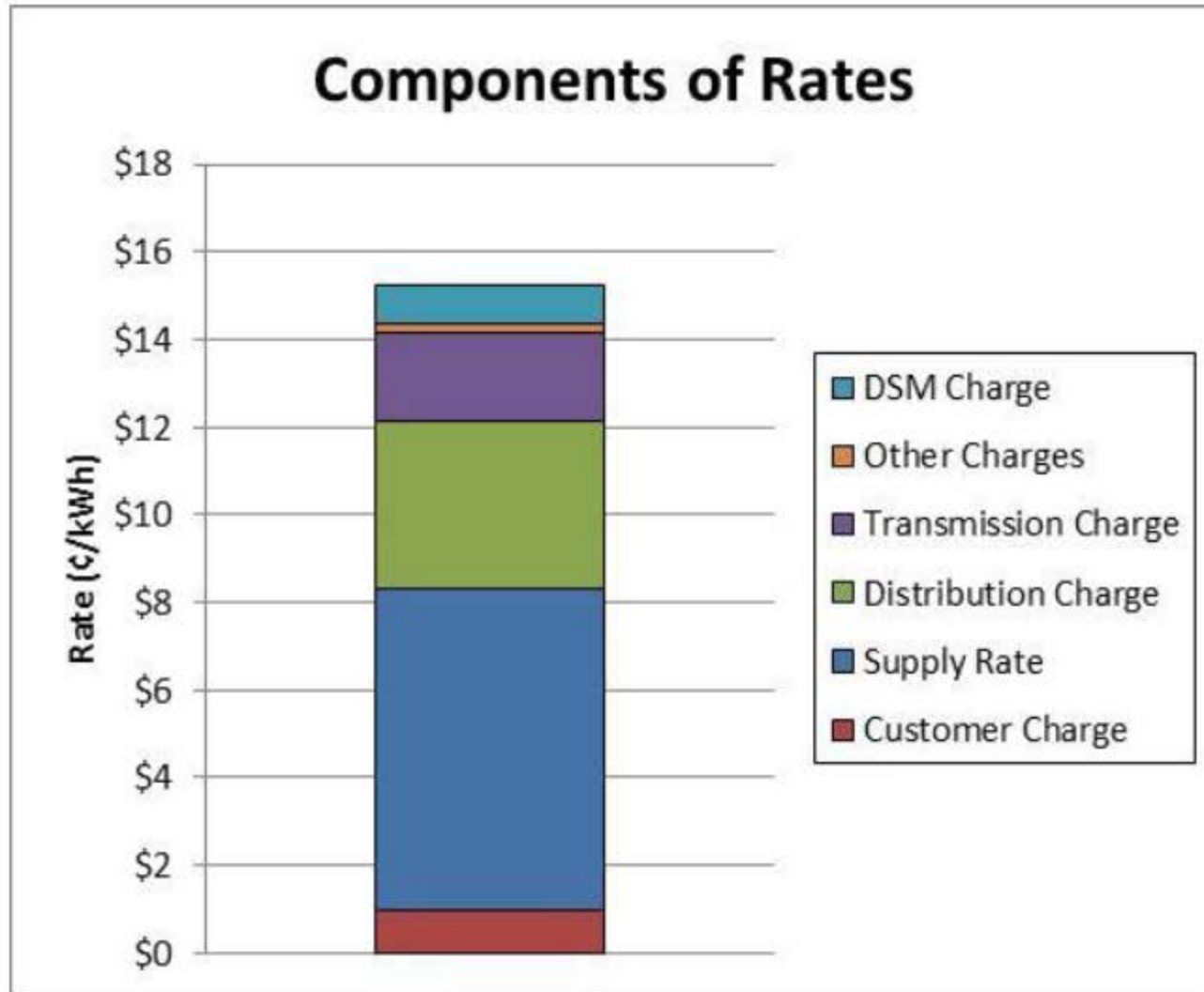
Actual Utility with Aggressive Efficiency Plan

- Analysis here is based on a proposed three-year energy efficiency plan for Rhode Island.
- Program costs recovered through a system benefits charge. Distribution rates are decoupled.
- Standard EE programs, targeted to all customer types:
 - Low-income: audit and retrofit at no cost.
 - Residential: new construction, retrofits, lighting, appliances, HVAC.
 - C&I: new construction, small C&I, large C&I.
- Relatively aggressive programs have been in place for many years.
- Significant ramp-up in efficiency savings in recent years.
- Proposed annual energy savings: 2.4% for 2015-2017.

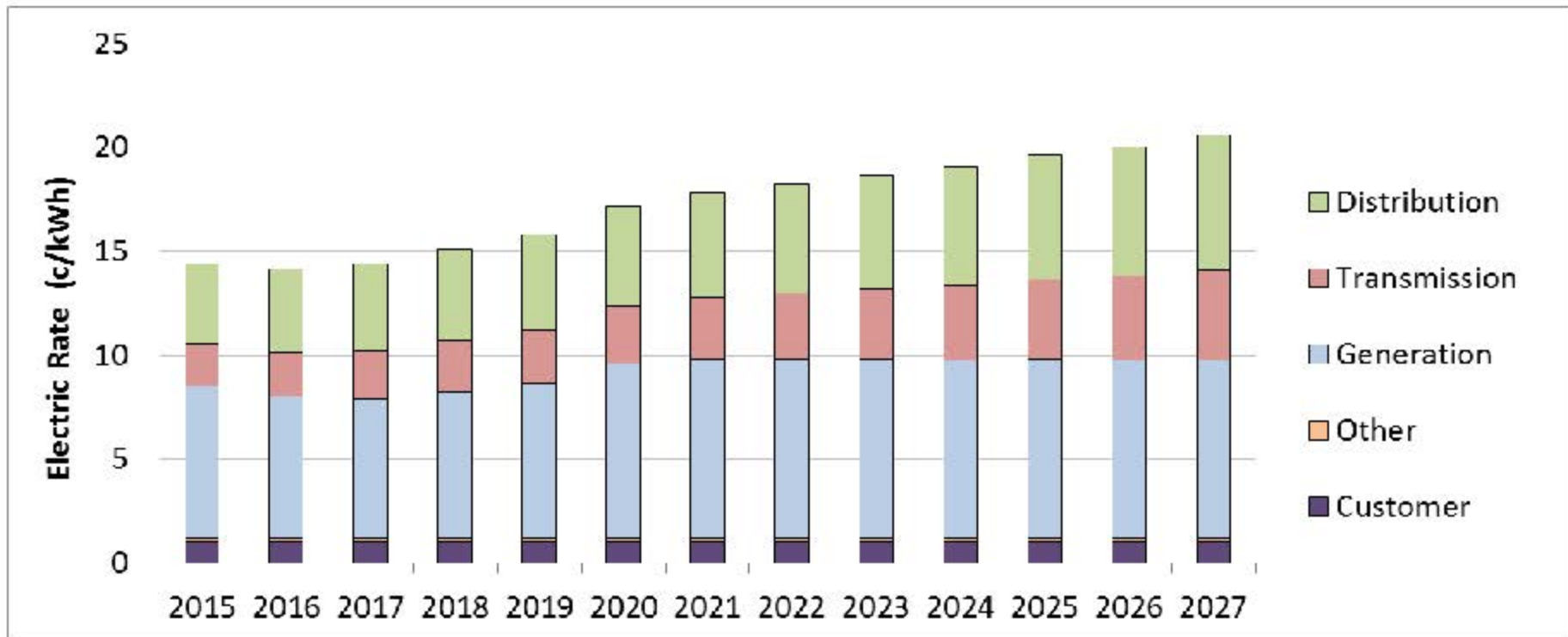
Relatively Cost Effective Programs

- Program average benefit-cost ratios:
 - Low-income: 1.5
 - Residential: 1.6
 - C&I: 2.9
 - Total: 2.3
- Program average cost of saved energy (¢/lifetime kWh):
 - Low-income: 12.9
 - Residential: 7.7
 - C&I: 3.7
 - Total: 4.9

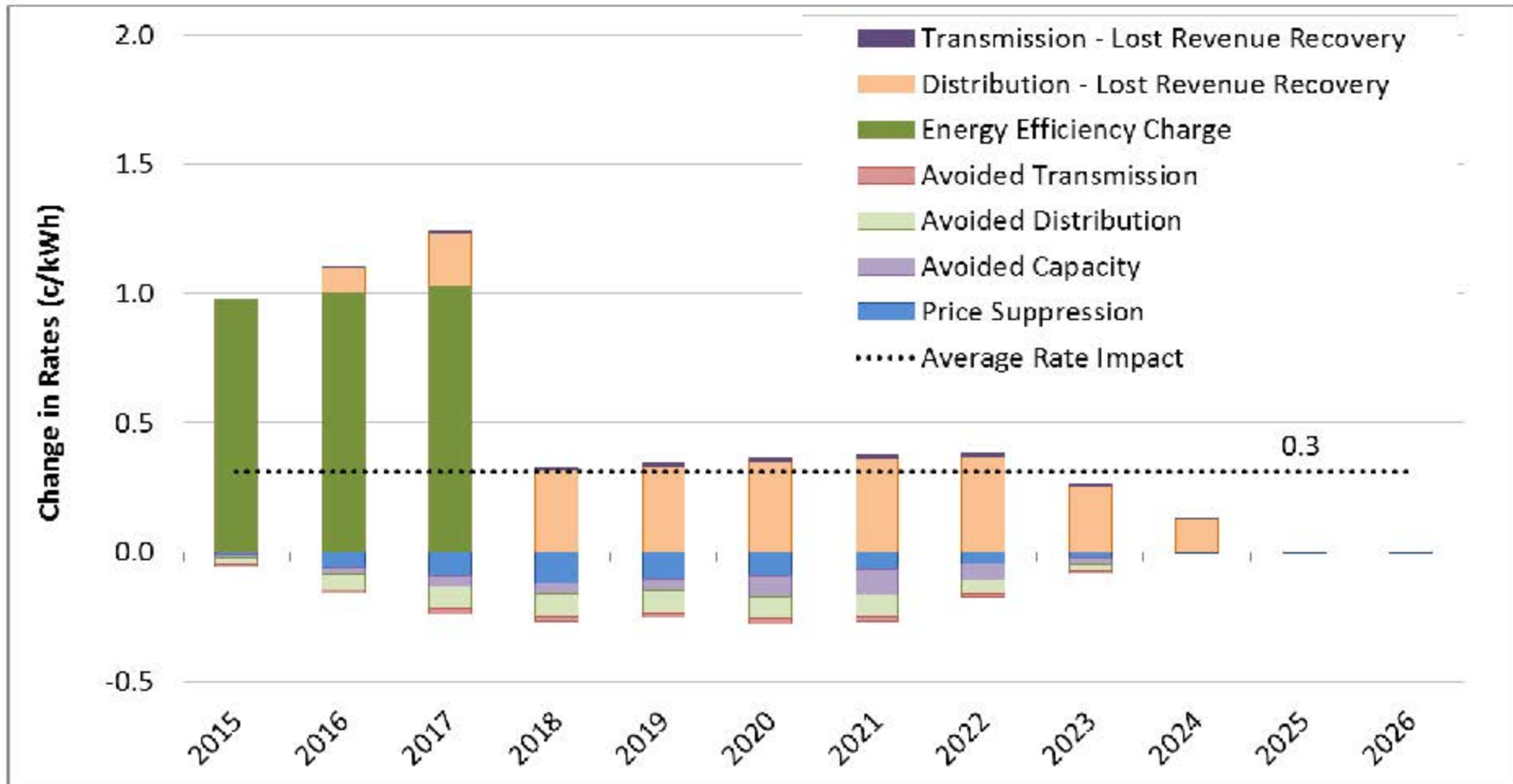
Breakdown of Current Rates



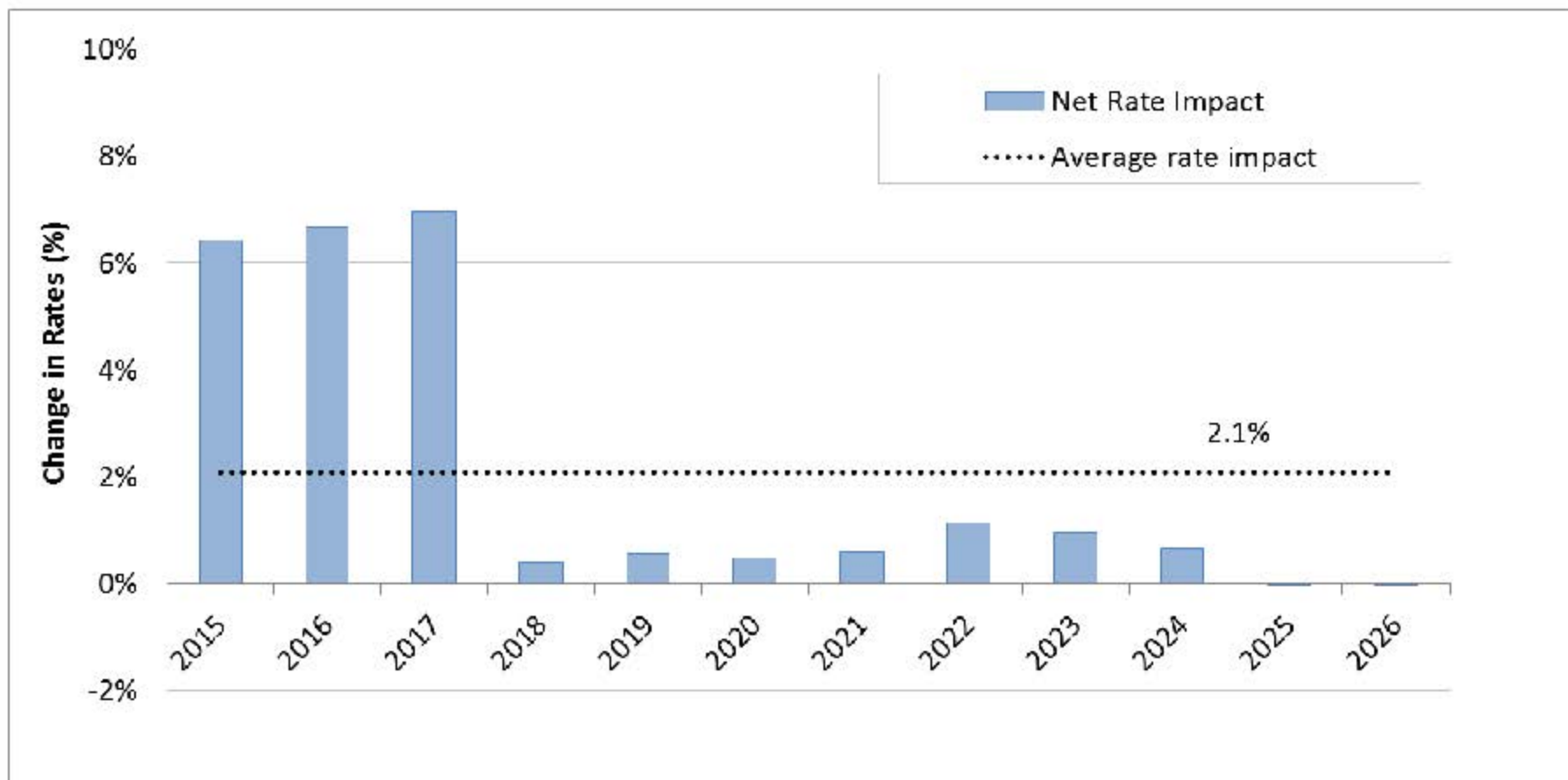
Forecast of Rates – Without Efficiency



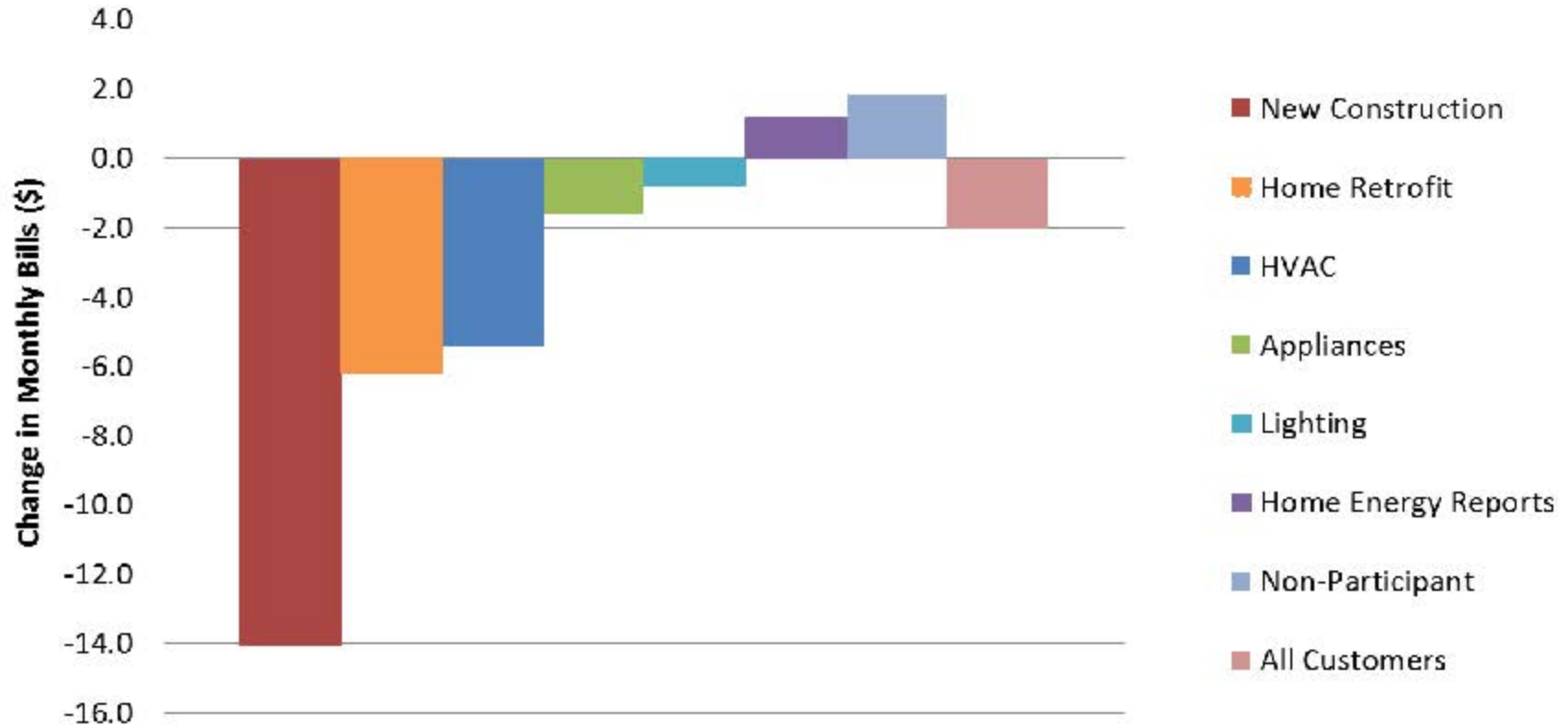
Residential Rate Impacts – by Components



Residential Rate Impacts - Net

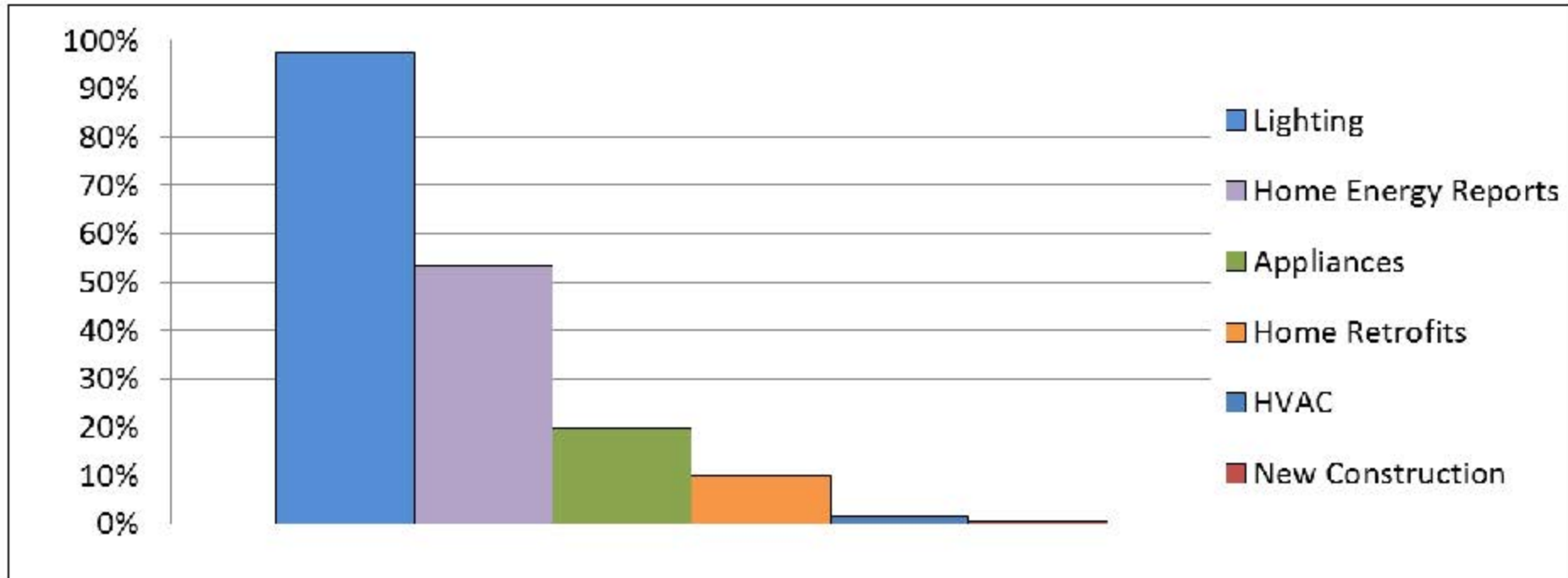


Residential Bill Impacts – by Program



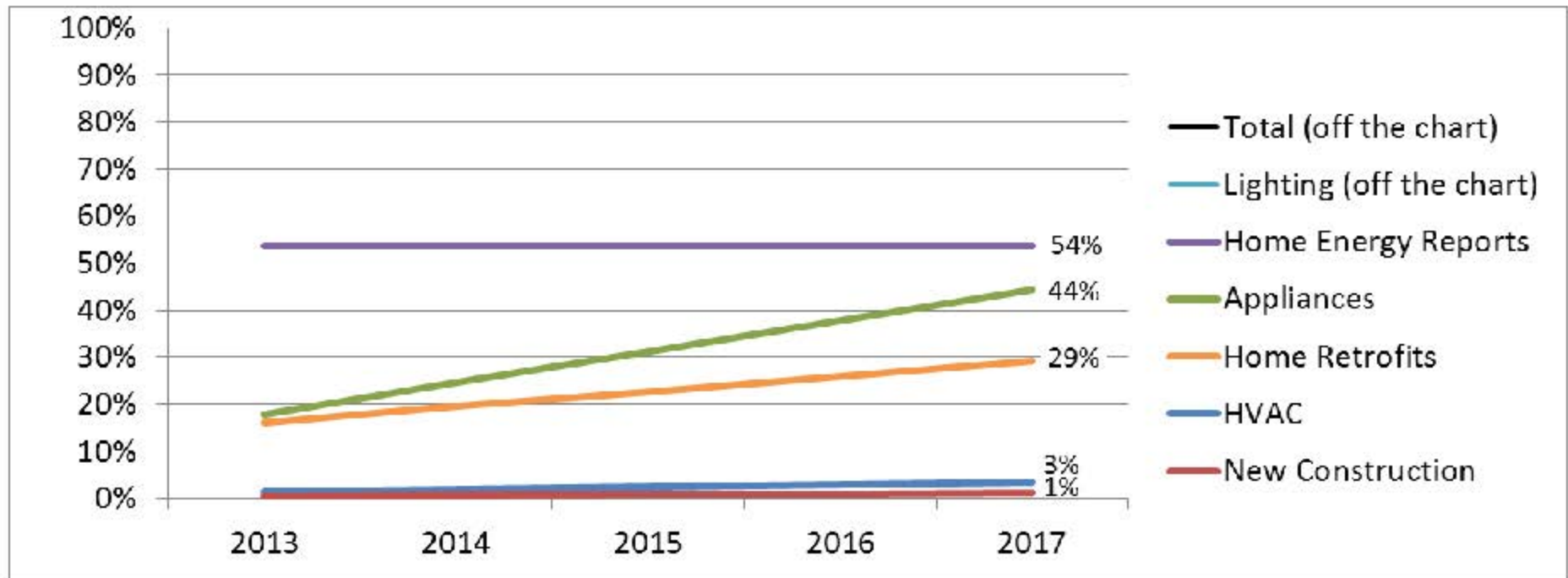
Assumes participation in only one program.

Residential Participation Rates: 2015-2017



Accounts for double participation

Residential Participation Rates: 1998 - 2017



Accounts for double participation

Summary of Results - Residential

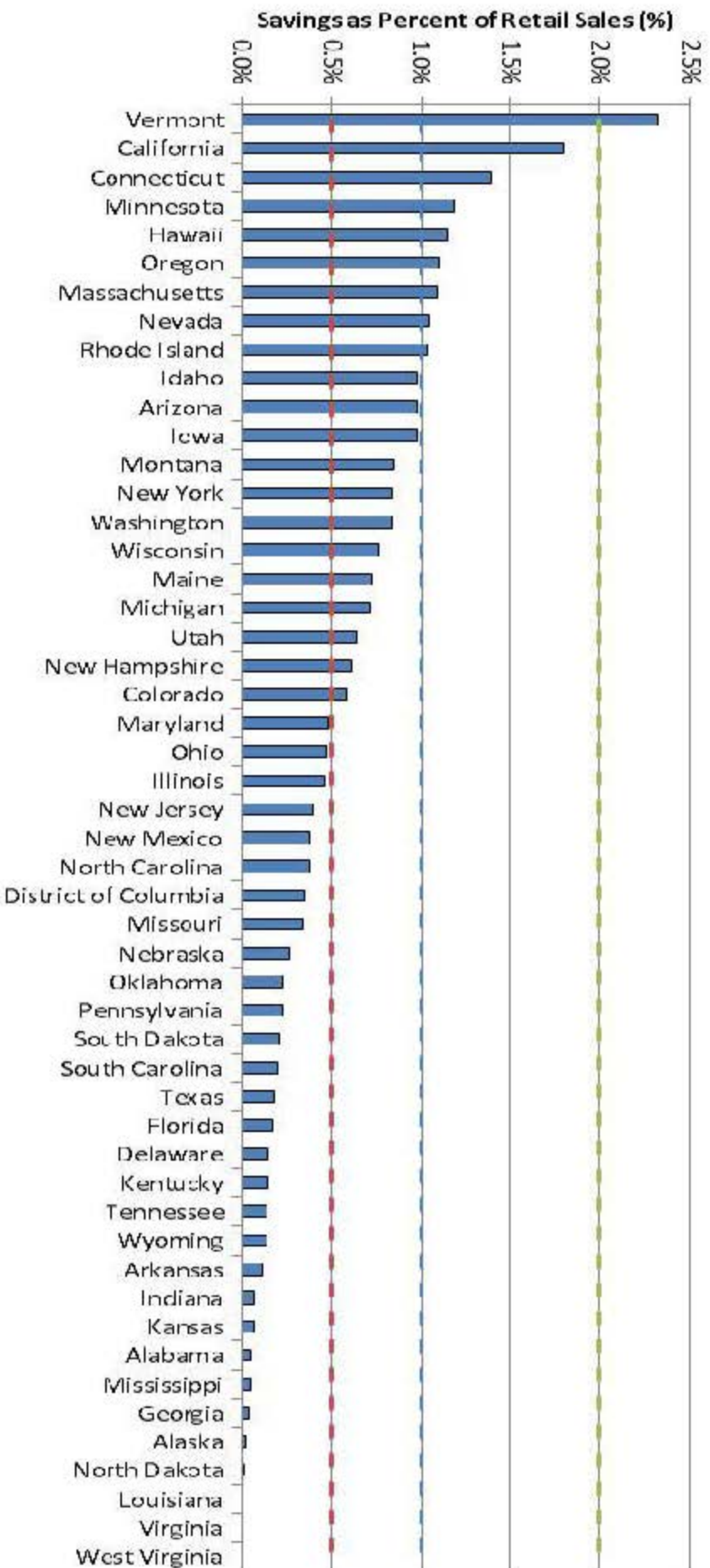
	Rate Impacts	Bill Savings	2015-2017 Participation
	(% of Total Rate)	(% of Total Bill)	(New % of Customers)
New Construction	2.1%	9.3%	0.5%
HVAC	2.1%	5.5%	1.5%
Home Retrofit	2.1%	6.3%	9.8%
Home Energy Reports	2.1%	-1.4%	53.5%
Lighting	2.1%	0.7%	97.5%
Appliances	2.1%	1.5%	19.7%
Non-Participant	2.1%	-2.1%	a minority

Accounts for double participation

Summary of Results – All Sectors

	Highest Single-Year Rate Increase	Average Long-Term Rate Increase	Range of Bill Savings	General Participation Conclusion For Cumulative Participation 1998-2017
Residential	7%	2%	-1% to 9%	Vast majority of customers participate.
Low-Income	8%	2%	-2% to 12%	Large majority of LI dwellings get retrofits.
Small C&I	6%	1%	37% to 47%	Roughly 30% of customers participate.
Large C&I	9%	0%	2% to 3%	Majority of customers participate.

2010 Electricity Savings by State (% of Sales)



Source: ACEEE 2012 Energy Efficiency Scorecard

What Does This Mean for Other States?

- This analysis is not directly transferable to other states.
 - However, some general conclusions can be drawn.
- States where efficiency savings is 0.5% or less:
 - Rate impacts probably in the noise.
 - Participation rates probably very low.
- States where efficiency savings is 1.0%-0.5%:
 - Rate impacts probably small.
 - Participation rates probably low to moderate.
- States where efficiency savings is 2.0% or greater.
 - Rate impacts: short-term probably acceptable, long-term probably modest.
 - Participation rates probably high to very high.
 - Participation rates nearly offset the rate impacts.

Program Designs to Increase Participation

- EE programs should address all end-uses.
- EE programs should address all customer types.
- All customers should have an opportunity to participate.
- Customer incentives and support should be tailored to assist all customers in overcoming barriers to energy efficiency.
- Program Administrators should actively pursue the non-participants and those who have not participated in a while.

Policy Options to Increase Participation

- Increase budgets to increase participation.
 - This is the exact opposite of the typical response to rate impact concerns.
- Require program administrators to gather better data on participation; annual & cumulative.
- Require program administrators to analyze participation rates when designing programs.
- Include participation requirements in efficiency plans and goals.
- Incorporate participation rates in utility shareholder incentives.
- Make the participation goal explicit:
 - Achieving all cost-effective energy efficiency means serving all customers.

Appendix

Appendix

Benefits of EE that Flow to All Customers - I

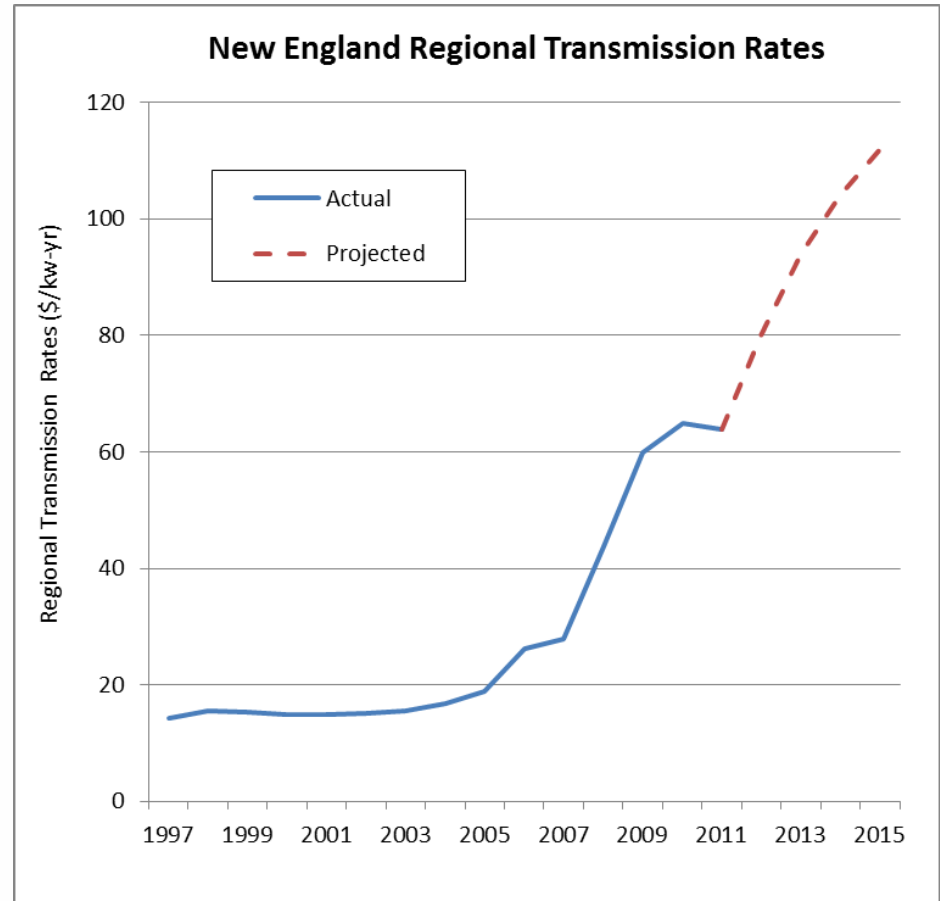
- Increased system reliability.
- Reduced risk and exposure to volatile fossil fuel prices.
- Reduced cost of compliance with environmental regulations.
- Reduced consumption of fossil fuels.
- Reduced reliance upon imported fuels.
- Reduced environmental impacts, including reduced greenhouse gases.

Benefits of EE that Flow to All Customers - II

- EE will reduce the price of the wholesale energy and capacity markets in New England.
 - Lower peak and energy demands means that marginal supply-side resources are dispatched less.
 - This results in a lower market clearing price.
- This benefit flows to all customers in New England, regardless of whether they participate in EE programs.
- The MA Three-Year Plans were estimated to save over \$700 million for all MA customers.
 - This is in addition to the bill savings to participants.

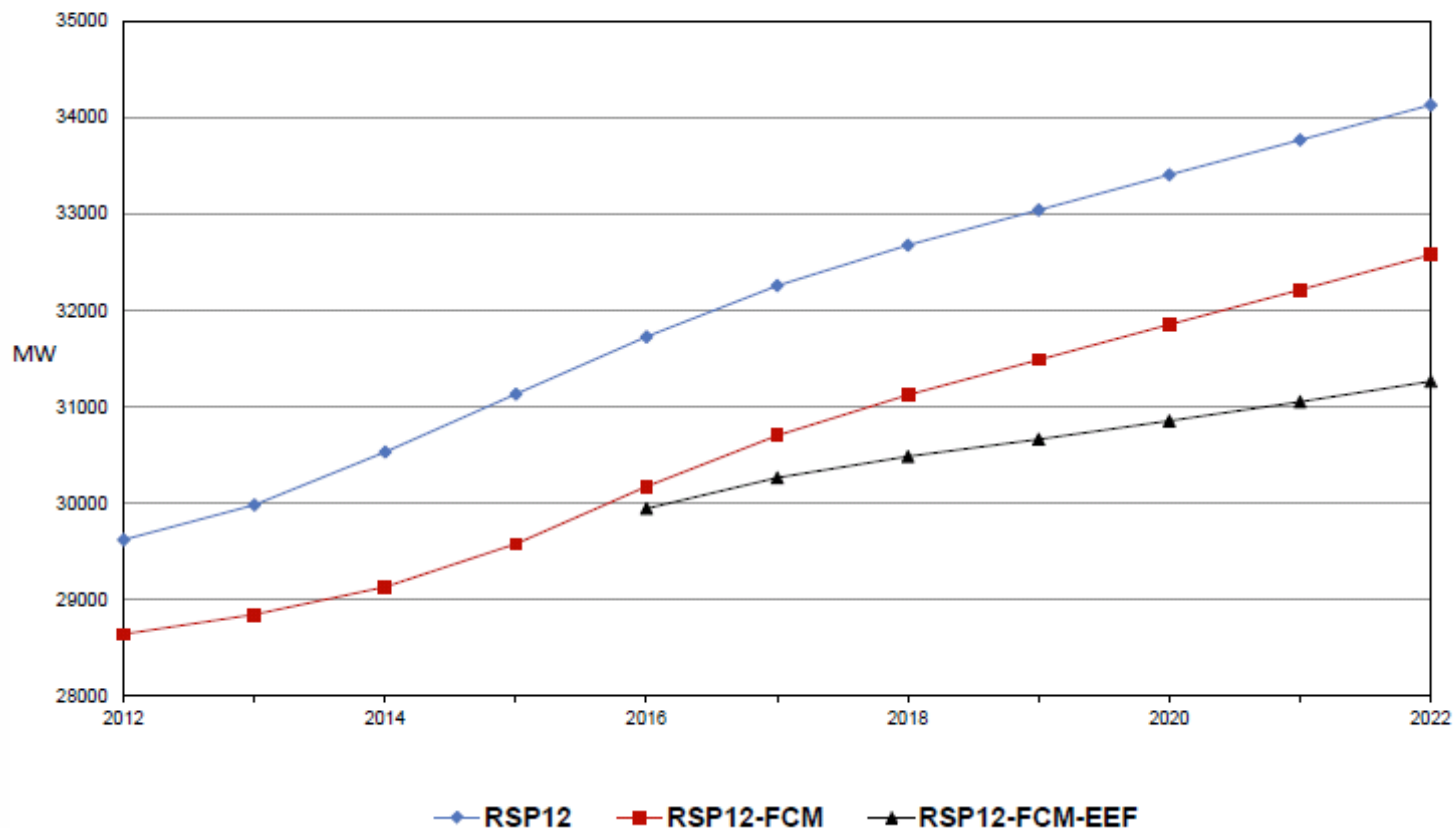
Benefits of EE that Flow to All Customers - III

- Energy efficiency will avoid costs of transmission and distribution lines.
- MA Three-Year Plans were estimated to save roughly \$423 million in avoided T&D costs.
 - This is in addition to the bill savings to participants.
- Transmission costs in New England are expected to increase dramatically.



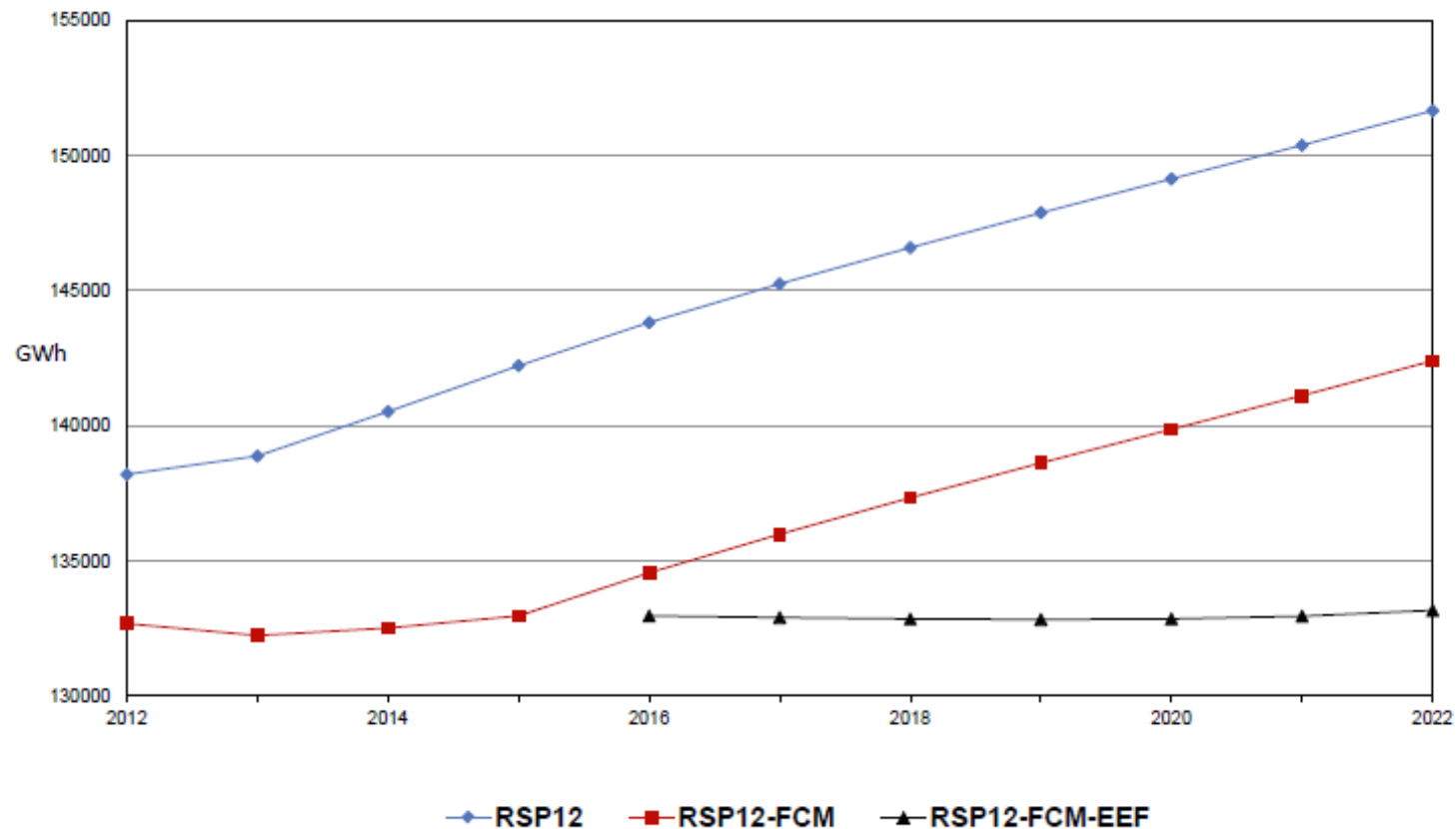
Impact of EE on New England Peak Demand

ISONE Summer Peak (90/10) Forecast

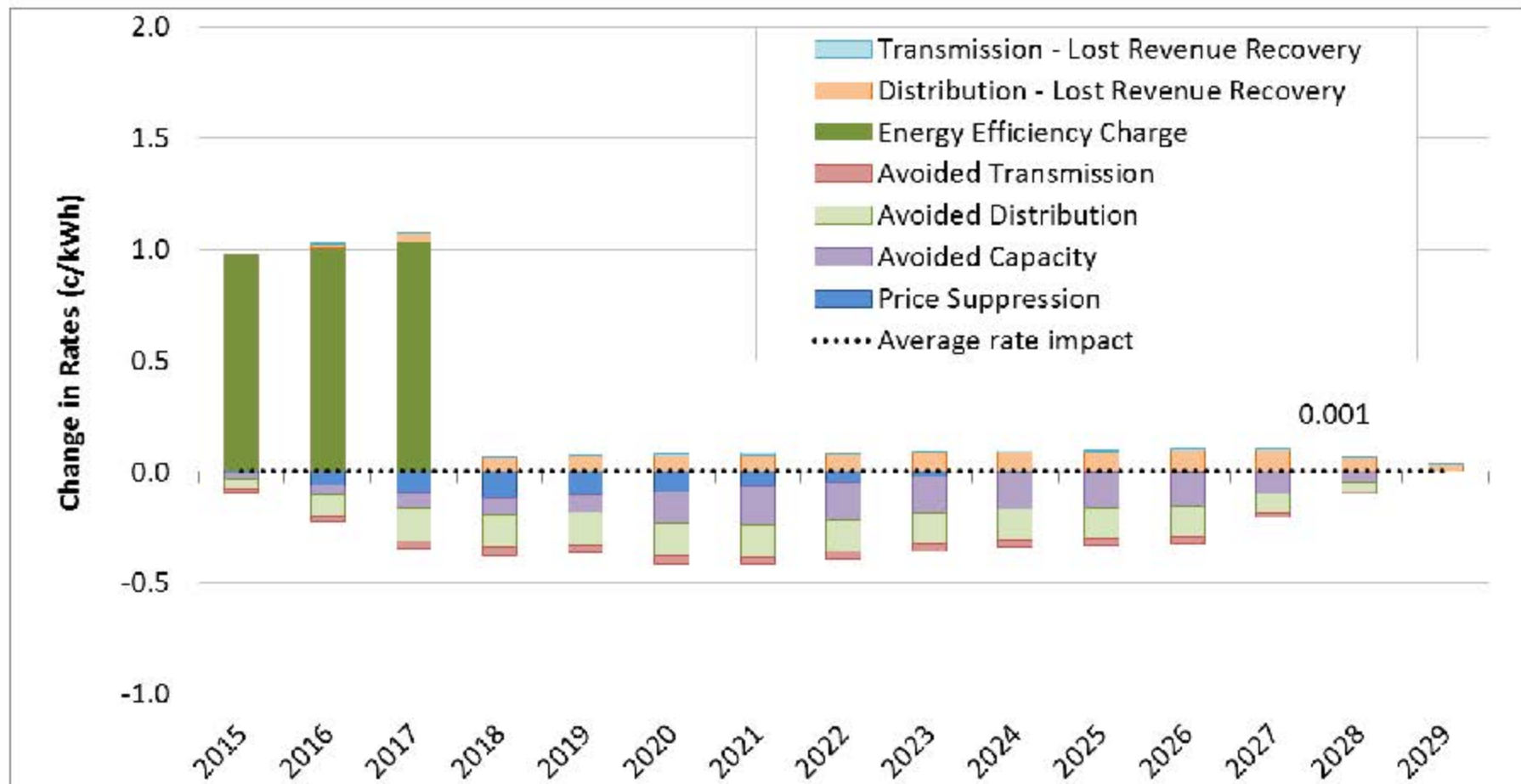


Impact of EE on New England Energy Demand

ISONE Annual Energy Forecast



Large C&I Rate Impacts – by Components



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Request IR-13:

Please provide the range of achievable potential available for the 2016-2018 period and associated costs (please provide in electronic format):

(a) for each program proposed by E1;

(b) for each end use category (e.g. residential lighting); and

(c) by measure.

Response IR-13:

The EL-RAM used to calculate the Plan did not calculate achievable potential; it calculated targets and investments. ENSC's DSM Potential Study did calculate achievable potential, so ENS is providing this information for each modelled DSM Scenario. Please refer to Attachment 1.

Achievable Potential and Associated Investment for the 2016-2018 Period

Program	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Efficient Products	61,957	9.0	17.8	18,036	1.9	7.7	72,891	10.4	18.6	76,859	11.0	19.6
Existing Homes	68,840	25.2	37.3	60,396	23.3	28.5	91,261	34.5	50.7	130,329	54.6	152.3
Energy Savings Actions	45,000	11.8	4.4	45,000	11.8	4.4	45,000	11.8	4.4	45,000	11.8	4.4
New Construction	24,629	7.3	18.7	24,539	7.3	14.8	24,847	7.3	18.9	25,328	7.4	19.4
Business Energy Rebates	80,910	17.0	23.4	43,872	8.6	15.9	111,880	23.7	31.8	127,526	27.1	42.2
Custom	116,819	17.0	27.0	104,241	15.2	31.1	148,474	21.6	32.5	159,208	23.2	39.1
Business Energy Solutions	19,672	5.0	8.1	16,162	4.2	8.1	24,420	6.3	9.3	26,398	6.8	10.7
Program Total	417,828	92.4	136.7	312,246	72.2	110.7	518,775	115.6	166.3	590,647	141.8	287.7
Enabling Strategies			16.3			16.3			16.3			16.3
Total	417,828	92.4	153.0	312,246	72.2	126.9	518,775	115.6	182.5	590,647	141.8	304.0

End-Use Category	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
RES-Appliance	34,392	6.6	19.4	19,213	4.0	16.6	40,022	7.4	19.6	42,397	7.8	19.9
RES-Behaviour	46,559	11.8	4.4	46,540	11.8	4.4	46,561	11.8	4.4	46,568	11.8	4.4
RES-HVAC/Shell	52,176	21.5	15.2	44,745	19.6	13.4	71,850	29.2	18.7	78,055	31.5	22.8
RES-Lighting	26,238	3.0	8.7	8,056	0.9	3.7	30,520	3.5	9.2	31,031	3.6	9.3
RES-Plug Load	6,532	0.9	2.1	4,809	0.7	2.4	7,241	1.0	2.3	8,186	1.2	2.7
RES-Water Heat	6,653	2.0	2.2	67	0.0	0.1	6,740	2.1	2.3	6,864	2.1	2.3
RES-Packaging	27,818	7.4	26.2	24,540	7.3	14.8	30,851	9.0	36.0	63,809	26.8	133.7
COM-Lighting	48,192	12.5	16.4	26,114	6.8	11.7	68,058	17.6	22.5	77,678	20.1	30.1
COM-Other	66,297	10.6	16.2	58,405	9.3	17.9	82,908	13.0	19.2	88,930	13.8	22.9
COM-HVAC	15,425	0.7	3.9	12,506	0.6	4.1	19,936	0.9	4.8	21,965	1.0	6.0
COM-Motors	6,902	1.1	1.9	3,715	0.6	1.3	9,529	1.5	2.6	11,344	1.8	3.6
COM-Refrigeration	3,982	0.8	1.6	1,726	0.3	0.8	4,815	0.9	1.8	5,134	1.0	1.9
COM-Process	1,597	0.4	0.3	1,396	0.4	0.4	1,794	0.5	0.3	1,951	0.5	0.4
IND-Motors	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
IND-Refrigeration	31	0.0	0.0	9	0.0	0.0	45	0.0	0.0	52	0.0	0.0
IND-Lighting	16,608	4.3	4.7	8,035	2.1	3.3	23,989	6.2	6.2	27,447	7.1	8.0
IND-HVAC	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
IND-Process	58,232	8.7	13.4	52,176	7.8	15.5	73,720	10.9	16.1	79,040	11.7	19.3
IND-Other	194	0.0	0.1	193	0.0	0.1	195	0.0	0.1	196	0.1	0.1
IND-Agriculture	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
IND-Custom	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
End-Use Total	417,828	92.4	136.7	312,246	72.2	110.7	518,775	115.6	166.3	590,647	141.8	287.7
Enabling Strategies			16.3			16.3			16.3			16.3
Total	417,828	92.4	153.0	312,246	72.2	126.9	518,775	115.6	182.5	590,647	141.8	304.0

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Refrigerator Retirement	5,766	1.0	1.2	400	0.1	0.1	7,480	1.3	1.2	8,402	1.5	1.2
Freezer Retirement	10,092	1.8	2.1	847	0.2	0.3	12,520	2.2	2.0	13,604	2.4	2.0
Room A/C Retirement	0	0.0	0.0	0	0.0	0.0	24	0.0	0.0	25	0.0	0.0
13 W CFL	3,083	0.3	1.0	22	0.0	0.0	3,083	0.3	1.0	3,083	0.3	1.0
23 W CFL	2,176	0.2	0.6	24	0.0	0.0	2,176	0.2	0.6	2,176	0.2	0.6
14 W Dimmable CFL	476	0.1	0.4	3	0.0	0.0	476	0.1	0.4	476	0.1	0.4
8 W LED	736	0.1	0.5	5	0.0	0.0	738	0.1	0.5	742	0.1	0.5
8 W LED	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
12 W LED	541	0.1	0.3	4	0.0	0.0	542	0.1	0.3	546	0.1	0.3
12 W LED	46	0.0	0.1	0	0.0	0.0	46	0.0	0.1	46	0.0	0.1
5W Chandelier LED bulb	563	0.1	0.3	4	0.0	0.0	564	0.1	0.3	567	0.1	0.3
1W LED Nightlight	470	0.1	0.2	3	0.0	0.0	471	0.1	0.2	474	0.1	0.2
Low Flow Faucet Aerator, 1.5 GPM	2,574	0.8	0.7	16	0.0	0.0	2,588	0.8	0.7	2,624	0.8	0.7
Low Flow (1.25 GPM) showerhead	1,853	0.6	0.7	12	0.0	0.0	1,863	0.6	0.7	1,889	0.6	0.7
DHW Pipe Insulation	406	0.1	0.2	3	0.0	0.0	408	0.1	0.2	414	0.1	0.2
DHW Tank Wrap	1,204	0.4	0.5	7	0.0	0.0	1,210	0.4	0.5	1,226	0.4	0.5
Energuide 83 New Home	2,729	0.8	2.0	2,727	0.8	1.6	2,732	0.8	2.0	2,741	0.8	2.0
Energuide 84 New Home	3,274	1.0	2.1	3,272	1.0	1.8	3,279	1.0	2.1	3,290	1.0	2.1
Energuide 85 New Home	3,820	1.1	3.2	3,817	1.1	2.5	3,825	1.1	3.2	3,838	1.1	3.3
Energuide 86 New Home	4,366	1.3	3.3	4,362	1.3	2.6	4,371	1.3	3.3	4,386	1.3	3.3
Energuide 87 New Home	4,912	1.5	3.4	4,908	1.5	2.8	4,918	1.5	3.4	4,934	1.5	3.4
Energuide 88 New Home	5,457	1.6	4.6	5,453	1.6	3.5	5,464	1.6	4.6	5,483	1.6	4.6
Energy Star® Regular CFL	9,006	1.0	2.7	85	0.0	0.1	12,860	1.4	3.4	12,860	1.4	3.4
Energy Star® Specialty CFL	490	0.1	0.2	3	0.0	0.0	490	0.1	0.2	490	0.1	0.2
Energy Star® LED Lamps	1,655	0.2	0.6	1,102	0.1	0.5	1,889	0.2	0.7	2,164	0.2	1.0
Hardwired Dimmer Switch	625	0.1	0.2	574	0.1	0.3	660	0.1	0.2	700	0.1	0.2
Indoor Motion Sensor	1,689	0.2	0.4	1,660	0.2	0.7	1,719	0.2	0.4	1,757	0.2	0.3
Outdoor Motion Sensor	4,682	0.5	1.1	4,566	0.5	2.0	4,805	0.5	0.8	4,949	0.6	0.7
Power bar with integrated timer	1,833	0.3	0.5	1,402	0.2	0.7	2,015	0.3	0.5	2,259	0.4	0.6
Smartstrip	4,395	0.6	1.5	3,175	0.4	1.6	4,892	0.7	1.7	5,556	0.8	2.1
Heavy Duty Outdoor Timer	304	0.0	0.1	232	0.0	0.1	335	0.0	0.1	372	0.0	0.1
CEE Tier 3 Refrigerator	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
CEE Tier 3 Clothes Washer	2,899	0.1	1.1	2,331	0.0	1.1	4,386	0.1	1.4	4,755	0.1	1.7

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
DHW Tank Wrap	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Programmable Electronic Thermostat (Baseboard)	2,835	0.3	0.7	16	0.0	0.0	3,091	0.3	0.6	3,134	0.4	0.6
Outdoor Clothes line	1,559	0.0	0.0	1,540	0.0	0.0	1,561	0.0	0.0	1,568	0.0	0.0
Energy Star Ventilating Fan	137	0.0	5.1	137	0.0	5.1	137	0.0	5.1	137	0.0	5.1
EnergyStar Dehumidifier	3,248	0.8	2.4	3,248	0.8	2.4	3,248	0.8	2.4	3,248	0.8	2.4
EnergyStar Dehumidifier	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
EnergyStar Refrigerator	6,967	1.7	6.7	6,967	1.7	6.7	6,967	1.7	6.7	6,967	1.7	6.7
EnergyStar Freezer	5,421	1.3	6.0	5,421	1.3	6.0	5,421	1.3	6.0	5,421	1.3	6.0
Certified Wood Stove	4,399	2.1	0.4	4,215	2.1	0.5	6,569	3.2	0.5	7,029	3.4	0.6
Certified Wood Boiler or Furnace	8,763	3.2	1.5	9,369	3.4	1.4	12,015	4.4	2.0	13,393	4.9	2.6
Certified Pellet Stove	4,021	2.1	0.6	3,853	2.1	0.6	6,005	3.2	0.8	6,426	3.4	1.1
Certified Pellet Boiler or Furnace Supplemented by Baseboard Heat (Whole Home)	8,742	3.9	1.5	8,042	3.6	1.3	13,159	5.9	2.1	14,196	6.4	2.8
Advanced Automatic Pellet Combo Boiler	11,813	3.5	2.3	8,099	2.4	1.6	18,764	5.5	3.6	21,371	6.3	5.0
Ground Source Heat Pump	422	0.2	0.1	425	0.2	0.1	422	0.2	0.2	438	0.2	0.2
Energy Star Air Source Heat Pump	8,074	4.3	2.1	7,687	4.1	1.6	8,505	4.5	2.9	9,095	4.8	3.9
Solar DHW	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Solar Space and Water Heat (Supplement Electricity)	61	0.0	0.1	1	0.0	0.0	2,990	1.6	6.4	35,747	19.4	100.1
Solar Space Heating (Displacing Electricity)	2,632	1.6	0.8	2,592	1.5	1.1	2,664	1.6	0.8	2,276	1.3	0.7
Residential Solar PV	3,186	0.1	7.5	0	0.0	0.0	3,228	0.1	10.9	3,343	0.1	14.8
Solar DHW	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	3	0.0	0.0
Solar Space and Water Heat (Supplement Electricity)	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Solar Space Heating (Displacing Electricity)	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Residential Solar PV	13	0.0	0.0	0	0.0	0.0	44	0.0	0.1	47	0.0	0.1
Energy Star Windows (Replace Single Pane)	335	0.2	0.1	310	0.2	0.1	491	0.3	0.2	524	0.3	0.2
Energy Star Windows (300 ft2) (Replace Double Pane)	3	0.0	0.0	1	0.0	0.0	6	0.0	0.0	10	0.0	0.0
Energy Star Door	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Home Energy Report	45,000	11.8	4.4	45,000	11.8	4.4	45,000	11.8	4.4	45,000	11.8	4.4
DHW Tank Wrap	109	0.0	0.0	29	0.0	0.0	162	0.0	0.1	190	0.1	0.1
Low Flow Faucet Aerator, 1.5 GPM	278	0.1	0.1	1	0.0	0.0	279	0.1	0.1	283	0.1	0.1
DHW Pipe Insulation	24	0.0	0.0	0	0.0	0.0	24	0.0	0.0	25	0.0	0.0
Low Flow (1.25 GPM) showerhead	205	0.1	0.1	0	0.0	0.0	206	0.1	0.1	209	0.1	0.1
Unidentified Residential Future ET	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Under Counter Commercial Dishwasher (Low Temp)	292	0.1	0.1	292	0.1	0.1	293	0.1	0.1	295	0.1	0.1
Multi-Tank Conveyor Commercial Dish Washer (Low Temp)	448	0.2	0.1	447	0.2	0.1	449	0.2	0.1	452	0.2	0.1
Under Counter Dishwasher with Booster (High Temp)	347	0.1	0.1	3	0.0	0.0	348	0.1	0.1	351	0.1	0.1
Single Tank Door Dishwasher with Booster (High Temp)	468	0.2	0.1	468	0.2	0.1	470	0.2	0.1	473	0.2	0.1
Single Tank Conveyor Dishwasher with Booster (High Temp)	493	0.2	0.1	493	0.2	0.1	495	0.2	0.1	498	0.2	0.1
Multi Tank Conveyor Dishwasher with Booster (High Temp)	876	0.3	0.2	875	0.3	0.2	878	0.3	0.2	884	0.3	0.2
Standard Capacity Commercial Electric Fryers	252	0.1	0.2	2	0.0	0.0	253	0.1	0.2	254	0.1	0.2
Full Size Commercial Hot Food Holding Cabinet	518	0.1	0.1	4	0.0	0.0	519	0.1	0.1	523	0.1	0.1
Three Quarter Size Commercial Hot Food Holding Cabinet	236	0.0	0.1	204	0.0	0.1	301	0.1	0.1	323	0.1	0.1
Half Size Commercial Hot Food Holding Cabinet	157	0.0	0.0	148	0.0	0.0	197	0.0	0.0	208	0.0	0.1
Commercial Electric Griddle	347	0.1	0.1	346	0.1	0.1	347	0.1	0.1	350	0.1	0.1
Solid Door Commercial Refrigerator	21	0.0	0.0	0	0.0	0.0	21	0.0	0.0	21	0.0	0.0
Glass Door Commercial Refrigerator	148	0.0	0.0	1	0.0	0.0	149	0.0	0.0	150	0.0	0.0
Solid Door Commercial Freezer	21	0.0	0.0	0	0.0	0.0	36	0.0	0.0	36	0.0	0.0

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Glass Door Commercial Freezer	46	0.0	0.0	0	0.0	0.0	46	0.0	0.0	47	0.0	0.0
EStar Ice Making Head	297	0.1	0.1	2	0.0	0.0	298	0.1	0.1	300	0.1	0.1
Energy Star Remote Condensing Head/Split System Ice Maker	349	0.1	0.1	3	0.0	0.0	350	0.1	0.1	352	0.1	0.1
Energy Star Self Contained Ice Maker	86	0.0	0.0	1	0.0	0.0	86	0.0	0.0	87	0.0	0.0
Energy Star Commercial Electric Convection Oven	201	0.0	0.1	200	0.0	0.1	201	0.0	0.1	203	0.0	0.1
Variable Speed Drive for Kitchen exhaust fans (Demand Controlled Ventilation)	1,702	0.3	0.3	1,230	0.0	0.3	2,255	0.4	0.4	2,578	0.4	0.5
Variable Speed Drive for Kitchen exhaust fans (Demand Controlled Ventilation)	631	0.1	0.2	649	0.2	0.2	788	0.1	0.2	850	0.1	0.3
Energy Star, CEE Tier 2 or CEE Tier 3 Commercial Clothes Washer	229	0.1	0.1	229	0.1	0.1	230	0.1	0.1	231	0.1	0.1
Night Covers for 3' Refrigerated Display Cases	38	0.0	0.0	0	0.1	0.0	61	0.0	0.0	62	0.0	0.0
Night Covers for 3' Refrigerated Display Cases	42	0.0	0.0	0	0.0	0.0	69	0.0	0.0	70	0.0	0.0
Night Covers for 3' Refrigerated Display Cases	47	0.0	0.0	0	0.0	0.0	73	0.0	0.0	75	0.0	0.0
Night Covers for 3' Refrigerated Display Cases-BES	15	0.0	0.0	0	0.0	0.0	15	0.0	0.0	15	0.0	0.0
Night Covers for 3' Refrigerated Display Cases-BES	18	0.0	0.0	0	0.0	0.0	29	0.0	0.0	29	0.0	0.0
Night Covers for 3' Refrigerated Display Cases-BES	18	0.0	0.0	0	0.0	0.0	18	0.0	0.0	19	0.0	0.0
Zero Energy Doors for Reach-In Coolers and Freezers	106	0.0	0.0	103	0.0	0.0	133	0.0	0.0	141	0.0	0.0
Zero Energy Doors for Reach-In Coolers and Freezers	152	0.0	0.0	147	0.0	0.0	190	0.0	0.0	202	0.0	0.0
Zero Energy Doors for Reach-In Coolers and Freezers	151	0.0	0.0	146	0.0	0.0	189	0.0	0.0	201	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers	57	0.0	0.0	52	0.0	0.0	72	0.0	0.0	78	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers	82	0.0	0.0	75	0.0	0.0	103	0.0	0.0	111	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers	81	0.0	0.0	75	0.0	0.0	103	0.0	0.0	111	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers-BES	22	0.0	0.0	0	0.0	0.0	22	0.0	0.0	23	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers-BES	32	0.0	0.0	0	0.0	0.0	32	0.0	0.0	33	0.0	0.0
Humidity-Based Door Heater Controls for Reach-In Coolers and Freezers-BES	31	0.0	0.0	0	0.0	0.0	32	0.0	0.0	33	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers	13	0.0	0.0	7	0.0	0.0	18	0.0	0.0	21	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers	19	0.0	0.0	10	0.0	0.0	25	0.0	0.0	29	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers	19	0.0	0.0	10	0.0	0.0	25	0.0	0.0	29	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers-BES	5	0.0	0.0	5	0.0	0.0	7	0.0	0.0	8	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers-BES	8	0.0	0.0	7	0.0	0.0	10	0.0	0.0	11	0.0	0.0
Evaporator Fan Motor Controls for Walk-In Freezers and Coolers-BES	8	0.0	0.0	7	0.0	0.0	10	0.0	0.0	11	0.0	0.0
Intelligent (Electronic) Defrost Control For Freezer Display Cases	12	0.0	0.0	5	0.0	0.0	16	0.0	0.0	19	0.0	0.0
Intelligent (Electronic) Defrost Control For Freezer Display Cases	17	0.0	0.0	7	0.0	0.0	23	0.0	0.0	28	0.0	0.0
Intelligent (Electronic) Defrost Control For Freezer Display Cases	17	0.0	0.0	7	0.0	0.0	23	0.0	0.0	28	0.0	0.0
Intelligent (Electronic) Defrost Control For Walk-In Freezers	22	0.0	0.0	15	0.0	0.0	30	0.0	0.0	34	0.1	0.0
Intelligent (Electronic) Defrost Control For Walk-In Freezers	32	0.1	0.0	21	0.0	0.0	43	0.1	0.0	48	0.1	0.0
Intelligent (Electronic) Defrost Control For Walk-In Freezers	32	0.1	0.0	21	0.0	0.0	42	0.1	0.0	48	0.1	0.0
Outside Air Economizer For Walk-In Cooler	66	0.0	0.1	66	0.0	0.1	67	0.0	0.1	69	0.0	0.1
Outside Air Economizer For Walk-In Cooler	94	0.0	0.2	94	0.0	0.1	96	0.0	0.2	98	0.0	0.2

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Outside Air Economizer For Walk-In Cooler	94	0.0	0.2	93	0.0	0.1	95	0.0	0.2	98	0.0	0.2
Outside Air Economizer For Walk-In Cooler-BES	27	0.0	0.0	0	0.0	0.0	28	0.0	0.0	29	0.0	0.0
Outside Air Economizer For Walk-In Cooler-BES	39	0.0	0.0	0	0.0	0.0	40	0.0	0.0	41	0.0	0.0
Outside Air Economizer For Walk-In Cooler-BES	39	0.0	0.0	0	0.0	0.0	39	0.0	0.0	41	0.0	0.0
Refrigerated Vending Machine Controller	48	0.0	0.0	40	0.0	0.0	61	0.0	0.0	67	0.0	0.0
Refrigerated Vending Machine Controller	64	0.0	0.0	54	0.0	0.0	83	0.0	0.0	91	0.0	0.0
Refrigerated Vending Machine Controller	92	0.0	0.0	78	0.0	0.0	119	0.0	0.0	130	0.0	0.0
Strip Curtains for 3' Open Refrigerated Display Cases	310	0.0	0.1	136	0.0	0.1	403	0.0	0.1	439	0.0	0.1
Strip Curtains for 3' Open Refrigerated Display Cases	443	0.0	0.1	195	0.0	0.1	576	0.1	0.1	628	0.1	0.1
Strip Curtains for 3' Open Refrigerated Display Cases	442	0.0	0.1	195	0.0	0.1	575	0.1	0.1	626	0.1	0.1
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	28	0.0	0.0	1	0.0	0.0	28	0.0	0.0	29	0.0	0.0
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Open Drip-Proof (ODP) and Totally Enclosed Fan Cooled (TEFC) Motors	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications	22	0.0	0.0	9	0.0	0.0	30	0.0	0.0	36	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications	29	0.0	0.0	12	0.0	0.0	41	0.0	0.0	49	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications	42	0.0	0.0	17	0.0	0.0	59	0.0	0.0	71	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications	42	0.0	0.0	17	0.0	0.0	59	0.0	0.0	70	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications-BES	9	0.0	0.0	0	0.0	0.0	15	0.0	0.0	15	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications-BES	12	0.0	0.0	0	0.0	0.0	20	0.0	0.0	21	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications-BES	17	0.0	0.0	0	0.0	0.0	28	0.0	0.0	29	0.0	0.0
Electronically Commutated (Brushless) DC Motors for Refrigeration Applications-BES	17	0.0	0.0	0	0.0	0.0	28	0.0	0.0	29	0.0	0.0
Variable Frequency Drives	753	0.1	0.2	304	0.0	0.1	1,071	0.2	0.3	1,308	0.2	0.5
Variable Frequency Drives	1,055	0.2	0.3	426	0.1	0.2	1,500	0.2	0.4	1,831	0.3	0.6
Variable Frequency Drives	1,346	0.2	0.4	544	0.1	0.2	1,915	0.3	0.6	2,339	0.4	0.9
Variable Frequency Drives	1,387	0.2	0.4	560	0.1	0.2	1,972	0.3	0.6	2,409	0.4	0.9
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)	2,812	0.7	0.7	1,156	0.3	0.4	4,281	1.1	0.9	4,998	1.3	1.2
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)	734	0.2	0.3	295	0.1	0.2	1,124	0.3	0.4	1,322	0.3	0.6
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)	1,562	0.4	0.4	620	0.2	0.2	2,362	0.6	0.6	2,773	0.7	0.8
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)	1,754	0.5	0.4	673	0.2	0.3	2,565	0.7	0.6	3,008	0.8	0.7
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)	2,184	0.6	0.6	851	0.2	0.3	3,241	0.8	0.8	3,806	1.0	1.1
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	1,284	0.3	0.5	288	0.1	0.2	1,849	0.5	0.6	2,017	0.5	0.7
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	335	0.1	0.1	310	0.1	0.2	418	0.1	0.2	450	0.1	0.2

Achievable Potential and Associated Investment for the 2016-2018 Period												
Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	704	0.2	0.3	458	0.1	0.3	929	0.2	0.4	1,055	0.3	0.5
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	764	0.2	0.3	371	0.1	0.2	1,047	0.3	0.4	1,234	0.3	0.5
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-Retrofit (dual baseline)-BES	970	0.2	0.3	786	0.2	0.4	1,243	0.3	0.4	1,372	0.4	0.5
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life	906	0.2	0.1	417	0.1	0.1	1,226	0.3	0.1	1,262	0.3	0.1
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life	12	0.0	0.0	12	0.0	0.0	12	0.0	0.0	12	0.0	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life	239	0.1	0.0	293	0.1	0.0	281	0.1	0.0	277	0.1	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life	110	0.0	0.0	262	0.1	0.0	252	0.1	0.0	248	0.1	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life	116	0.0	0.0	196	0.1	0.0	188	0.0	0.0	185	0.0	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life-BES	52	0.0	0.0	1	0.0	0.0	98	0.0	0.1	172	0.0	0.1
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life-BES	5	0.0	0.0	5	0.0	0.0	5	0.0	0.0	5	0.0	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life-BES	126	0.0	0.0	127	0.0	0.0	125	0.0	0.0	126	0.0	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life-BES	113	0.0	0.0	114	0.0	0.0	111	0.0	0.0	111	0.0	0.0
Fluorescent T5 and HPT8 Fixtures (4 FT) lamps-End of Life-BES	77	0.0	0.0	1	0.0	0.0	97	0.0	0.0	104	0.0	0.0
Relamp/Reballast-Retrofit (dual baseline)	6,913	1.8	1.9	2,812	0.7	1.1	10,618	2.7	2.8	12,461	3.2	3.8
Relamp/Reballast-Retrofit (dual baseline)	2,927	0.8	1.2	1,170	0.3	0.6	4,503	1.2	1.9	5,293	1.4	2.7
Relamp/Reballast-Retrofit (dual baseline)	6,595	1.7	1.9	2,636	0.7	1.1	10,145	2.6	2.9	11,910	3.1	4.0
Relamp/Reballast-Retrofit (dual baseline)	7,104	1.8	2.5	2,839	0.7	1.4	10,927	2.8	3.8	12,839	3.3	5.4
Relamp/Reballast-Retrofit (dual baseline)	5,344	1.4	2.3	1,303	0.3	0.7	8,221	2.1	3.6	9,665	2.5	5.2
Relamp/Reballast-Retrofit (dual baseline)-BES	3,000	0.8	1.0	2,411	0.6	1.1	3,836	1.0	1.2	4,208	1.1	1.5
Relamp/Reballast-Retrofit (dual baseline)-BES	1,269	0.3	0.4	1,273	0.3	0.6	1,560	0.4	0.5	1,646	0.4	0.6
Relamp/Reballast-Retrofit (dual baseline)-BES	2,858	0.7	1.0	2,422	0.6	1.1	3,621	0.9	1.2	3,936	1.0	1.4
Relamp/Reballast-Retrofit (dual baseline)-BES	3,078	0.8	1.1	2,916	0.8	1.3	3,825	1.0	1.2	4,078	1.0	1.4
Relamp/Reballast-Retrofit (dual baseline)-BES	2,316	0.6	0.8	2,352	0.6	1.1	2,841	0.7	0.9	2,991	0.8	1.1
Relamp/Reballast-End of life replacement	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement-BES	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement-BES	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement-BES	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Relamp/Reballast-End of life replacement-BES	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
T8 Dimmable Stairwell Lighting	56	0.0	0.0	23	0.0	0.0	79	0.0	0.0	94	0.0	0.0
T8 Dimmable Stairwell Lighting	28	0.0	0.0	11	0.0	0.0	40	0.0	0.0	47	0.0	0.0
T8 Dimmable Stairwell Lighting	64	0.0	0.0	26	0.0	0.0	90	0.0	0.0	107	0.0	0.0
T8 Dimmable Stairwell Lighting	85	0.0	0.0	35	0.0	0.0	120	0.0	0.0	143	0.0	0.0
T8 Dimmable Stairwell Lighting	50	0.0	0.0	20	0.0	0.0	70	0.0	0.0	83	0.0	0.0
LED Lamps-Retrofit (dual baseline)	611	0.2	0.1	252	0.1	0.1	794	0.2	0.1	880	0.2	0.2
LED Lamps-Retrofit (dual baseline)	258	0.1	0.1	104	0.0	0.0	336	0.1	0.1	372	0.1	0.1
LED Lamps-Retrofit (dual baseline)	581	0.1	0.1	235	0.1	0.1	756	0.2	0.1	836	0.2	0.2
LED Lamps-Retrofit (dual baseline)	622	0.2	0.1	252	0.1	0.1	809	0.2	0.2	897	0.2	0.2
LED Lamps-Retrofit (dual baseline)	471	0.1	0.1	191	0.0	0.1	613	0.2	0.2	680	0.2	0.2
LED Lamps-Retrofit (dual baseline)-BES	217	0.1	0.1	225	0.1	0.1	222	0.1	0.2	233	0.1	0.2
LED Lamps-Retrofit (dual baseline)-BES	92	0.0	0.1	95	0.0	0.1	92	0.0	0.1	97	0.0	0.1
LED Lamps-Retrofit (dual baseline)-BES	207	0.1	0.1	214	0.1	0.1	211	0.1	0.1	222	0.1	0.2
LED Lamps-Retrofit (dual baseline)-BES	221	0.1	0.2	230	0.1	0.2	226	0.1	0.2	238	0.1	0.2
LED Lamps-Retrofit (dual baseline)-BES	168	0.0	0.1	174	0.0	0.1	166	0.0	0.1	175	0.0	0.1
LED Lamps-End of Life	77	0.0	0.0	1	0.0	0.0	105	0.0	0.0	129	0.0	0.1
LED Lamps-End of Life	38	0.0	0.0	1	0.0	0.0	52	0.0	0.0	63	0.0	0.1
LED Lamps-End of Life	87	0.0	0.0	2	0.0	0.0	119	0.0	0.1	146	0.0	0.1
LED Lamps-End of Life	116	0.0	0.0	2	0.0	0.0	159	0.0	0.1	196	0.1	0.1
LED Lamps-End of Life	67	0.0	0.0	1	0.0	0.0	91	0.0	0.1	112	0.0	0.1
LED Lamps-End of Life-BES	26	0.0	0.1	0	0.0	0.0	26	0.0	0.1	27	0.0	0.1
LED Lamps-End of Life-BES	13	0.0	0.0	0	0.0	0.0	18	0.0	0.0	19	0.0	0.0
LED Lamps-End of Life-BES	29	0.0	0.1	1	0.0	0.0	30	0.0	0.1	31	0.0	0.1
LED Lamps-End of Life-BES	39	0.0	0.1	1	0.0	0.0	40	0.0	0.1	41	0.0	0.1
LED Lamps-End of Life-BES	22	0.0	0.0	0	0.0	0.0	37	0.0	0.1	38	0.0	0.1
LED Refrigeration Strip Lighting-End of Life replacement	211	0.1	0.1	197	0.0	0.1	247	0.1	0.1	266	0.1	0.1
LED Refrigeration Strip Lighting-End of Life replacement	302	0.1	0.1	281	0.1	0.1	354	0.1	0.1	381	0.1	0.1
LED Refrigeration Strip Lighting-End of Life replacement	301	0.1	0.1	280	0.1	0.1	353	0.1	0.1	380	0.1	0.1
LED Exterior Fixtures-End of Life replacement	221	0.1	0.0	107	0.0	0.0	291	0.1	0.0	343	0.1	0.1
LED Exterior Fixtures-End of Life replacement	153	0.0	0.0	1	0.0	0.0	155	0.0	0.0	162	0.0	0.0
LED Exterior Fixtures-End of Life replacement	208	0.0	0.1	1	0.0	0.0	211	0.0	0.1	219	0.1	0.1
LED Exterior Fixtures-End of Life replacement	297	0.1	0.1	2	0.0	0.0	302	0.1	0.1	314	0.1	0.1
LED Exterior Fixtures-End of Life replacement	296	0.1	0.1	2	0.0	0.0	301	0.1	0.1	313	0.1	0.1
LED Exit Sign-End of Life replacement	4	0.0	0.0	3	0.0	0.0	5	0.0	0.0	6	0.0	0.0
LED Exit Sign-End of Life replacement	3	0.0	0.0	2	0.0	0.0	4	0.0	0.0	5	0.0	0.0
LED Exit Sign-End of Life replacement	5	0.0	0.0	3	0.0	0.0	6	0.0	0.0	7	0.0	0.0
LED Exit Sign-End of Life replacement	7	0.0	0.0	4	0.0	0.0	8	0.0	0.0	9	0.0	0.0
LED Exit Sign-End of Life replacement	7	0.0	0.0	4	0.0	0.0	8	0.0	0.0	9	0.0	0.0
Induction Lamp	36	0.0	0.0	15	0.0	0.0	50	0.0	0.0	61	0.0	0.0
Induction Lamp	18	0.0	0.0	7	0.0	0.0	24	0.0	0.0	29	0.0	0.0
Induction Lamp	39	0.0	0.0	17	0.0	0.0	51	0.0	0.0	58	0.0	0.0
Induction Lamp	52	0.0	0.0	23	0.0	0.0	69	0.0	0.0	79	0.0	0.0
Induction Lamp	31	0.0	0.0	13	0.0	0.0	44	0.0	0.0	53	0.0	0.0
Photoluminescent Exit Sign	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0
Photoluminescent Exit Sign	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Photoluminescent Exit Sign	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0	2	0.0	0.0
Photoluminescent Exit Sign	3	0.0	0.0	3	0.0	0.0	3	0.0	0.0	3	0.0	0.0
Photoluminescent Exit Sign	3	0.0	0.0	3	0.0	0.0	3	0.0	0.0	3	0.0	0.0
Lighting Controls - Occupancy Sensors	355	0.1	0.1	305	0.1	0.1	454	0.1	0.1	493	0.2	0.1
Lighting Controls - Occupancy Sensors	295	0.1	0.1	252	0.1	0.1	378	0.1	0.1	411	0.1	0.1
Lighting Controls - Occupancy Sensors	401	0.1	0.1	342	0.1	0.1	513	0.2	0.1	558	0.2	0.1
Lighting Controls - Occupancy Sensors	538	0.2	0.1	459	0.1	0.1	688	0.2	0.1	748	0.2	0.2
Lighting Controls - Occupancy Sensors	312	0.1	0.1	266	0.1	0.1	399	0.1	0.1	433	0.1	0.1
Cycling Refrigerated Air Dryers (≤ 300 CFM capacity)	113	0.0	0.0	68	0.0	0.0	152	0.0	0.0	173	0.0	0.0
Cycling Refrigerated Air Dryers (≤ 300 CFM capacity)	76	0.0	0.0	48	0.0	0.0	98	0.0	0.0	105	0.0	0.0
Cycling Refrigerated Air Dryers (≤ 300 CFM capacity)	27	0.0	0.0	16	0.0	0.0	36	0.0	0.0	41	0.0	0.0
Variable Speed Drive Screw Compressors (10 - 40 hp)	316	0.1	0.1	222	0.1	0.1	423	0.1	0.1	486	0.1	0.1
Variable Speed Drive Screw Compressors (10 - 40 hp)	226	0.1	0.0	157	0.0	0.0	303	0.1	0.0	349	0.1	0.1
Variable Speed Drive Screw Compressors (10 - 40 hp)	77	0.0	0.0	53	0.0	0.0	103	0.0	0.0	118	0.0	0.1
Air-Entraining Air Nozzles (up to 14CFM at 100 psi)	136	0.0	0.0	135	0.0	0.0	139	0.0	0.0	146	0.0	0.0
No-Loss Drains (Timed drains are not eligible)	122	0.0	0.0	66	0.0	0.0	166	0.0	0.0	195	0.1	0.0
Air Tanks for Load / No-Load Screw Compressors (10 - 40 hp)	1,181	0.3	0.2	1,167	0.3	0.3	1,203	0.3	0.2	1,262	0.3	0.3
Air Tanks for Load / No-Load Screw Compressors (10 - 40 hp)	849	0.2	0.1	838	0.2	0.2	864	0.2	0.1	907	0.2	0.2
Air Tanks for Load / No-Load Screw Compressors (10 - 40 hp)	83	0.0	0.0	82	0.0	0.0	85	0.0	0.0	89	0.0	0.0
High-Efficiency Air Source Heat Pumps	305	0.1	0.0	286	0.1	0.1	384	0.1	0.0	409	0.1	0.0
High-Efficiency Air Source Heat Pumps	348	0.1	0.0	324	0.1	0.1	440	0.1	0.0	472	0.1	0.0
High-Efficiency Air Source Heat Pumps	579	0.1	0.1	542	0.1	0.1	728	0.1	0.1	776	0.1	0.1
High-Efficiency Air Source Heat Pumps	580	0.1	0.1	543	0.1	0.1	729	0.1	0.1	778	0.1	0.1
Ground/Water Source Heat Pumps	17	0.0	0.0	18	0.0	0.0	21	0.0	0.0	22	0.0	0.0
Ground/Water Source Heat Pumps	19	0.0	0.0	20	0.0	0.0	24	0.0	0.0	25	0.0	0.0
Ground/Water Source Heat Pumps	31	0.0	0.0	33	0.0	0.0	39	0.0	0.0	41	0.0	0.0
Ground/Water Source Heat Pumps	31	0.0	0.0	34	0.0	0.0	39	0.0	0.0	42	0.0	0.0
Integrated Dual Enthalpy Economizer Controls	2,152	0.1	0.6	1,703	0.0	0.6	2,792	0.1	0.7	3,090	0.1	0.9
Integrated Dual Enthalpy Economizer Controls	2,920	0.1	0.8	2,310	0.1	0.8	3,788	0.1	1.0	4,192	0.1	1.3
Integrated Dual Enthalpy Economizer Controls	4,177	0.1	1.1	3,305	0.1	1.1	5,420	0.1	1.4	5,998	0.1	1.8
Integrated Dual Enthalpy Economizer Controls	4,164	0.1	1.1	3,294	0.1	1.1	5,402	0.1	1.4	5,979	0.1	1.8
HVAC Hotel Occupancy Sensor	102	0.0	0.0	93	0.0	0.0	130	0.0	0.0	142	0.0	0.1
Faucet Aerator	194	0.0	0.1	193	0.0	0.1	195	0.0	0.1	196	0.1	0.1
Faucet Aerator	152	0.0	0.1	152	0.0	0.1	153	0.0	0.1	154	0.0	0.1
Faucet Aerator	207	0.1	0.1	206	0.1	0.1	208	0.1	0.1	210	0.1	0.1
Faucet Aerator	296	0.1	0.2	295	0.1	0.2	297	0.1	0.2	300	0.1	0.2
Faucet Aerator	295	0.1	0.2	294	0.1	0.2	296	0.1	0.2	299	0.1	0.2
DHW Tank Wrap	41	0.0	0.0	41	0.0	0.0	41	0.0	0.0	41	0.0	0.0
DHW Tank Wrap	79	0.0	0.1	79	0.0	0.1	80	0.0	0.1	80	0.0	0.1
DHW Pipe Insulation	7	0.0	0.0	7	0.0	0.0	7	0.0	0.0	7	0.0	0.0
DHW Pipe Insulation	14	0.0	0.0	14	0.0	0.0	14	0.0	0.0	15	0.0	0.0
Low Flow Showerheads	85	0.0	0.1	85	0.0	0.1	85	0.0	0.1	86	0.0	0.1
Lower Wattage High Intensity Discharge (HID) Lighting	26	0.0	0.0	10	0.0	0.0	36	0.0	0.0	44	0.0	0.0
Lower Wattage High Intensity Discharge (HID) Lighting	22	0.0	0.0	9	0.0	0.0	31	0.0	0.0	37	0.0	0.0
Lower Wattage High Intensity Discharge (HID) Lighting	61	0.0	0.0	26	0.0	0.0	81	0.0	0.0	93	0.0	0.0
Lower Wattage High Intensity Discharge (HID) Lighting	23	0.0	0.0	9	0.0	0.0	32	0.0	0.0	39	0.0	0.0
Halogen Lights with Infrared Coating	11	0.0	0.0	5	0.0	0.0	15	0.0	0.0	17	0.0	0.0

Achievable Potential and Associated Investment for the 2016-2018 Period

Measure	Base			Low			Mid			High		
	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M	MWh	MW	\$M
Halogen Lights with Infrared Coating	7	0.0	0.0	4	0.0	0.0	10	0.0	0.0	12	0.0	0.0
Halogen Lights with Infrared Coating	12	0.0	0.0	6	0.0	0.0	16	0.0	0.0	19	0.0	0.0
Halogen Lights with Infrared Coating	19	0.0	0.0	9	0.0	0.0	27	0.0	0.0	30	0.0	0.0
Halogen Lights with Infrared Coating	11	0.0	0.0	5	0.0	0.0	15	0.0	0.0	17	0.0	0.0
Custom Efficiency	56,622	8.2	13.1	50,720	7.4	15.1	71,942	10.5	15.8	77,118	11.2	18.9
Custom Efficiency	60,197	8.8	13.9	53,521	7.8	16.0	76,532	11.1	16.8	82,089	11.9	20.1
Unidentified Industrial Future ET	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Unidentified Commercial Future ET	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0
Whole Building 20% Over Baseline	19	0.0	0.0	0	0.0	0.0	71	0.0	0.0	202	0.0	0.2
Whole Building 40% Over Baseline	39	0.0	0.0	0	0.0	0.0	142	0.0	0.1	404	0.0	0.3
Measure Total	417,828	92.4	136.7	312,246	72.2	110.7	518,775	115.6	166.3	590,647	141.8	287.7
Enabling Strategies			16.3			16.3			16.3			16.3
Total	417,828	92.4	153.0	312,246	72.2	126.9	518,775	115.6	182.5	590,647	141.8	304.0

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Request IR-14:

(a) Please provide DSM resource plan scenarios (in a format similar to Figures 3.2 to 3.4 and the associated ELRAMs) that provide an average measure life greater than 10 years for programs that directly provide energy and demand savings (i.e. excluding enabling strategies) for within a \$20 annual investment level.

(i) Maximize annual energy savings

(ii) Maximize annual demand savings

(iii) Provide at least 100 GWh and 20 MW per year with the lowest investment cost for 2016-2018.

(b) Please provide the lowest cost DSM resource plan (in a format similar to Figures 3.2 to 3.4 and the associated ELRAMs) with an average measure life greater than 10 years that delivers an annual energy savings of 100 GWh and demand savings of 20 MW over the 2016-2018 contract period.

Response IR-14:

a) ENS did not develop these scenarios as part of its 2016-2018 DSM Resource Plan development process so is not able to provide them. Modelling runs, particularly those varying so significantly from current DSM levels, and those with specific limitations as requested by NSPI, take extensive time and effort to complete. Further, ENS believes such an approach would prevent the future delivery of long-term energy savings as identified in the 2014 Integrated Resource Plan which contribute to the minimization of utility revenue requirements over the planning period. Such an approach is also not consistent with DSM portfolio design principles and considerations, as outlined by Dunsy Energy Consulting in Appendix F of EfficiencyOne's Application.

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1

2 b) Please refer to part a).

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Request IR-15:

Reference: EfficiencyOne, Evidence - Page 48, Figure 4.2:

Please explain why E1 does not list the “\$M” as a performance target that E1 must operate within and why it does not include the price of DSM (\$/kWh) as a performance target or indicator.

Response IR-15:

As stated in the Application Evidence, page 47, lines 12-15:

With respect to Total Spending, ENS recognizes that it has no recourse to seek additional revenue in the event of over-expenditure and accepts this as an inherent business risk that ENS must manage. Therefore, ENS proposes that an associated Performance Target is not required.

As ENS has no recourse to seek additional revenue in the event of over-expenditure, and since a performance target for energy savings has been proposed, a performance target for unit cost (\$/kWh) would be redundant.

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Request IR-16:

Reference: EfficiencyOne, Evidence - Page 51, Section 4.5.2:

E1's states:

...it is expected that ENS will be in a position to claim ITCs in 2015.

(a) Please describe if receipt of ITCs has been incorporated into the 2016 – 2018 budget presented to the UARB.

(b) Please provide revisions to Figures 1.2, 1.3 and 1.4 in Appendix A if the ultimate ITCs result is different than budgeted.

(c) When will E1 have a decision or direction on this from CRA?

(d) If receipt of ITCs was not accounted for in E1's budgeted numbers, what process would E1 propose to credit customers if E1 was able to claim ITC.

(e) If E1 would have received ITCs in 2014, please confirm that the cost of the average kW/h savings of \$.25/kW/h in 2014 would be reduced by the HST amount.

(f) What process would E1 propose to collect/credit the program costs if different from the assumption in the proposed plan?

Response IR-16:

a) Yes.

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b) If EfficiencyOne is not able to claim ITCs during the implementation of the 2016-2018 DSM Resource Plan, the organization recognizes that it will be solely responsible for any incurred HST costs. For this reason, Figures 1.2, 1.3, and 1.4 would need to be revised to include a reduction in energy savings. ENS has not modelled such a scenario and is therefore unable to provide it.

For future DSM Resource Plans, HST would be incorporated as an expense within any funding level approved if EfficiencyOne is not able to claim ITCs.

c) At this time, it is unknown when EfficiencyOne will have direction from Canada Revenue Agency.

d) Please refer to part a).

e) Confirmed.

f) Please refer to part b).

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Request IR-17:

Reference: EfficiencyOne, Evidence - Page 28, Lines 14-17:

E1 states that changes to the methodology used to estimate the DSM demand savings has “led to a change in the demand-to-energy ratio from prior DSM plans”, resulting in “lower demand savings than the Base-DSM Scenario from ENS’s DSM Potential Study”.

(a) Please explain why the introduction of “8760 hourly savings profiles” for DSM programs produces a reduction in projected demand savings.

(b) Please explain in detail how E1 proposes that the projected demand savings be evaluated and verified.

(c) Please provide a table(s) in electronic format comparing the peak demand savings by measure in the currently filed plan to those in Navigant’s 2014 potential study Base Case.

(d) Please provide a description of the methodology and sources used to derive the potential study demand savings estimates and the methodology used to derive the demand savings estimates in the current filing.

(e) Please provide a comparison of the 8760 DSM savings profiles by measure for the initial 8760 profiles provided to NS Power in mid-February (associated with the Feb 4 Preliminary plan) with those used to prepare this filing.

(f) In ENS and Navigant’s view, what other enhancements to the DSM potential study could be made in the future?

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Response IR-17:

a) This difference is a result of different modelling techniques used for ENSC's DSM Potential Study and its proposed 2016-2018 DSM Resource Plan. As a result of this change in modelling technique, demand savings values for some measures increased, while some decreased, resulting in an overall decrease to modelled demand savings.

The methodology for calculating demand savings within the DSM Potential Study used Technical Reference Manual data from other jurisdictions. Where appropriate (e.g. climate-dependent measures), this data was adjusted to account for the Nova Scotian climate and coincident system peak timing. The rigor associated with this modelling effort, similar to ENSC's accepted evaluation practices for demand savings, was consistent with the level of emphasis on demand savings at the time.

In 2014, both through consultation with NSPI, and through the provision of updated avoided costs of capacity, ENSC understood there to be an increased emphasis on capacity avoidance. In collaboration with NSPI, ENSC and Navigant refined the methodology used to model system coincident peak demand impacts. A new methodology of calculating demand savings resulted from this effort.

The 2016-2018 DSM Resource Plan methodology, in general, relies on the modelling of representative energy efficiency measures within residential and BNI building types (representative of the NS building stock) using building simulation software. In particular, NSPI provided ENS with anonymous, one-year load profile data, in 8760 hourly format, for typical BNI customers, as well as customer class data for the Commercial and Industrial classes. For Residential data, NSPI provided customer class data, as well as data for various energy usage strata within the Residential class. Navigant used this load profile data to calibrate simulation models for various building types.

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1 The building simulations were used to develop DSM Resource shapes in 8760 format.
2 This was made possible by running the simulation models using historical Nova Scotia
3 weather data. The results of these simulation models provided, in 8760 format,
4 representative end-use type resource savings profiles for ENS's energy efficiency
5 measures within the EL-RAM.

6
7 The hourly resource savings values were averaged across likely system coincident peak
8 hours in order to ascertain normalized system coincident peak demand savings by end-
9 use type and system coincident peak demand savings by measure.

10
11 b) How energy or demand savings are evaluated is a decision made in consultation with
12 ENS's third-party evaluator. ENS's past evaluations have relied on various methods of
13 evaluation, ranging from the application of demand-to-energy ratios (as calculated by
14 Navigant) for some prescriptive programs, to the customized calculation of system
15 coincident peak diversity ratios, using site and project specific data, for the Custom
16 program.

17
18 ENS continuously investigates new methods for the evaluation of program impacts, and
19 will continue to work with industry experts, consultants and its third-party evaluator to
20 develop and adopt new techniques as relevant for the evaluation of demand savings, prior
21 to the implementation of 2016 DSM activities.

22
23 The verification process is determined by the UARB.

24
25 c) Please refer to Attachment 1, filed electronically.

26
27 d) Please refer to part a).

28
29 e) The 8760 model calculates resource savings profiles by measure type (e.g. Residential
30 Lighting), not by individual measure. Please refer to Attachment 2 for the comparison by

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- 1 measure type. Please note that only the Residential Lighting end-use is displayed, as no
2 other resource savings shapes have changed.
- 3
- 4 f) As with any modelling effort, ENS will discuss refinements and changes to the EL-RAM
5 model with Navigant during project initiation. ENS has not discussed the next iteration of
6 the DSM Potential Study at this time.

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Request IR-18:

Reference: EfficiencyOne, Evidence - Page 30, Lines 23-25:

E1 states that the DSM savings “are of benefit to Nova Scotians in the short term due to fuel savings resulting in lower bills for DSM participants.” For each of Residential and BNI sectors, please provide a table showing the estimated energy savings and number of participants, ranked by level of savings. Please provide using increments of 500 kWh/year savings (e.g. X participants save 0-500 kWh/yr, Y participants save 501-1000 kWh/year, Z participants save 1001-1500 kWh/year, etc.).

Response IR-18:

ENS has not analyzed estimated energy savings and number of participants by sector in its development of the Plan. Figures 1.2, 1.3, and 1.4 (Appendix A of the Application, pages 3, 4, and 5) provide energy savings by program, but rate classes are not restricted from participating in programs included under a particular sector. For example, BNI customers can participate in certain Residential programs, and vice versa for charitable customers and farms in the Residential class.

In its development of the Plan and the statement referenced by NSPI, ENS compared NSPI’s avoided costs for the Base and Low DSM Potential Study Scenarios. The comparison showed the Base DSM scenario providing greater fuel-related savings (avoided costs of energy) to Nova Scotians than the Low DSM scenario. The following table provides the additional fuel-related savings of the Base DSM scenario over that of the Low DSM scenario.

Year	Additional fuel-related savings of a Base DSM scenario over a Low DSM scenario¹
2016	\$3.7 million additional savings

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Year	Additional fuel-related savings of a Base DSM scenario over a Low DSM scenario¹
2017	\$5.9 million additional savings
2018	\$7.1 million additional savings

- 1
- 2 ¹ Calculated using NSPI's annual avoided costs applied to ENSC's DSM Potential Study, Base,
- 3 and Low Scenarios.

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Request IR-19:

Please provide in electronic format the following data from your DSM Data Tracking System for those customers that participated in DSM Programs in 2012 to 2014, inclusive:

- (a) Customer Name or Customer Identifier (Name, E1 identification code for individual customer, or other like identification)**
- (b) Rate Class (and any other identifiers available to distinguish customers in a rate class)**
- (c) Customer Location including postal code**
- (d) Annual energy and demand consumption (to the extent available)**
- (e) Business type (if applicable)**
- (f) Measure(s) installed**
- (g) kWh savings tracked**
- (h) kWh evaluated, if available**
- (i) \$ amounts of incentive provided (or financing, if applicable)**
- (j) \$ amounts of total project costs (Program administrator and customer costs separately)**

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Response IR-19:

EfficiencyOne asserts this IR, which is requesting individual, customer-specific details, engages issues of relevance and confidentiality.

The individualized detail sought by NSPI in this IR is not relevant to the matter currently before the UARB, which has as its primary purpose the conclusion and approval of a DSM supply agreement between EfficiencyOne and NSPI, involving the establishment of a DSM Resource Plan for the 2016-2018 period. This is particularly true given ENSC's and ENS's prior provision of aggregate information to the UARB and NSPI. ENS does not track information pertaining to parts d), e)¹, or the customer costs portion of j)² of this IR. All information sought pursuant to parts b), f), g), h) and i) of this IR has been provided in aggregate through ENS's Rate and Bill Impact Analysis Model, ENS's evaluation reports filed with the Board, and Efficiency Nova Scotia Corporation's financial statements. This information should be given deference in the present application given ENS's statutory expertise in the areas of DSM program design and execution, as indicated in subsection 79(L)(6) of the *Electricity Efficiency and Conservation (2014) Act*.

In addition, much of the information requested was tracked separately prior to 2014 and it would take an inordinate amount of work to consolidate. For example, the work to consolidate this information for ENSC's rate and bill impact analysis filings (which is on a rate-class and program basis) takes several months of full-time work due to the organization's existing information management system (hence ENS's original late filing of its initial rate and bill impact analysis in 2013, from March until October, and its subsequent request to file historical rate and bill impact analyses in October of each year). ENS has already consolidated it on a rate-class and per-program basis for its rate and bill impact analysis, which it has provided to NSPI and other stakeholders. To repeat the work on a per-customer basis would not be possible within the timeframe available within this proceeding. As stated in Appendix A of the Application, ENS is planning enhancements to its information management system in order to "easily track and

¹ Tracked for two program components for 2014 only (data not comprehensive).

² Tracked for four program components.

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provide insight into all relevant customer interactions” (page 23, lines 12-14), and “Efficiencies are expected to be in the form of reduced time spent on data processing and reporting [and] a reduction in external consultants required to develop reporting capabilities” (page 23, lines 22-24).

EfficiencyOne is under an ongoing legal duty to protect customers’ personal information and to only disclose same when obligated by law. While NSPI’s request states that an identifying number can be used, the combination of remaining requests would allow for the identification of individual customers. The identification of customers is not necessary in these proceedings.

Notwithstanding the foregoing, and in the interests of facilitating an expeditious procedure for the present Application, ENS is providing the following information in an aggregate format at the program component level (where possible) for 2012-2014:

- a) Customer identification data: number of participants provided in Attachment 1, filed electronically.
- b) Number of participants per rate class: please refer to Attachment 1, filed electronically.
- c) Customer location data: not provided.
- d) Annual energy and demand consumption: ENS does not have this information.
- e) Number of participants by business type: Please refer to Attachment 1 for components with tracked data, filed electronically.
- f) Number of measures installed: please refer to Attachment 1, filed electronically.
- g) Total tracked savings: please refer to Attachment 1, filed electronically.
- h) Total evaluated savings: please refer to Attachment 1, filed electronically.
- i) Total incentive dollars: please refer to Attachment 1, filed electronically.
- j) Total project costs: please refer to Attachment 1, filed electronically, for program administrator costs (by program/program component) and customer costs for those components for which data is tracked.

The first tab in Attachment 1 includes explanations of the general assumptions.

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Request IR-20:

Reference: EfficiencyOne, Evidence - Page 10:

Are you aware of or anticipate any potential changes to codes and standards (such as building codes) that will result in DSM benefits that are being considered for adoption between now and the end of 2018? If yes, please provide the information related to such changes and the associated savings.

Response IR-20:

ENS does not anticipate any changes to the energy component of building codes by 2018. For details on other codes and standards, please refer to EfficiencyOne's response to NSPI IR-34 part c).

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Request IR-21:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan, Page 13:

Please provide a list of custom projects for 2012 to 2014, inclusive with the following detail:

(a) Customer Name or Customer Identifier (Name, E1 identification code for individual customer or other like identification)

(b) Customer rate class

(c) Program (or sub-component, if applicable)

(d) Measures

(e) Energy saving estimate/evaluated

(f) Demand saving estimate/evaluated

(g) Total project cost estimate/actual

(h) Incentive estimate/actual

(i) Project start date

(j) Agreement date

(k) In-service date

(l) Customer's payback period without incentives

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(m) Customer's payback period with incentives

Response IR-21:

Please refer to EfficiencyOne's response to NSPI IR-19 for its position on individual customer-specific data and the requested information being provided. ENS is providing the following information in an aggregate format for the Custom program components (Custom Retrofit and Custom New Construction) for 2012-2014:

- a) Customer identification data: number of participants provided in EfficiencyOne's response to NSPI IR-19, Attachment 1, filed electronically.
- b) Number of participants per rate class: please refer to EfficiencyOne's response to NSPI IR-19, Attachment 1, filed electronically.
- c) Program components: separate tabs are provided for each component. Please refer to EfficiencyOne's response to NSPI IR-19, Attachment 1, filed electronically.
- d) Number of measures installed (projects): Please refer to EfficiencyOne's response to NSPI IR-19, Attachment 1, filed electronically.
- e) Total tracked and evaluated energy savings: Please refer to EfficiencyOne's NSPI IR-19, Attachment 1, filed electronically.
- f) Total tracked and evaluated demand savings: Please refer to EfficiencyOne's NSPI IR-19, Attachment 1, filed electronically.

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- 1 g) Total project costs (estimate and actual): Project cost estimates and actuals are received
2 and verified on a project-by-project basis. They are not in a consolidated form and cannot
3 be retrieved without accessing individual project files.
4
- 5 h) Total incentive dollars (estimate and actual): Please refer to EfficiencyOne's NSPI IR-19,
6 Attachment 1, filed electronically.
7
- 8 i) Project start date: This data cannot be presented in an aggregated format.
9
- 10 j) Agreement date: This data cannot be presented in an aggregated format.
11
- 12 k) In-service date: This data cannot be presented in an aggregated format.
13
- 14 l) Customer payback period without incentives: Customer payback periods are calculated
15 on a project-by-project basis. They are not in a consolidated form and cannot be retrieved
16 without accessing individual project files. Payback periods typically range from two to
17 eight years.
18
- 19 m) Customer payback period with incentives: Customer payback periods are calculated on a
20 project-by-project basis. They are not in a consolidated form and cannot be retrieved
21 without accessing individual project files. Payback periods typically range from two to
22 eight years.

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Request IR-22:

Reference: EfficiencyOne, Evidence - Page 9:

Please provide an estimate and supporting details of the direct installation savings for 2016-2018 including the number of customers served, energy and demand savings and cost.

Response IR-22:

Please refer to the table below.

Residential Direct Install	2016	2017	2018	Details
Number of Customers	11,003	11,367	10,577	Estimate based on average electrical savings per participant in 2015.
Demand Savings (kW)	2,729	2,755	2,494	Target demand savings are a sum of measure-level demand savings in the EL-RAM. Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1, filed electronically, for measure-level demand-savings details, found in column F.
Energy Savings (MWh)	20,543	21,223	19,747	Target energy savings are a sum of measure-level energy savings in the EL-RAM. Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1, filed electronically, for measure-level energy-savings details, found in column E.
Investment (\$M)	4.8	5.0	4.7	Investment dollars are a sum of measure-level investment in the EL-RAM. Please refer to EfficiencyOne's response to NSPI IR-10 Attachment 1, filed electronically, for measure-level investment details, found in column J.

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1 **Request IR-23:**

2
3 **Reference: EfficiencyOne, Appendix G – DSM Performance Indicators (Dunsky Energy**
4 **Consulting):**

5
6 **Appendix G proposes two target performance indicators (“TPI”) applied to the 2016-2018**
7 **DSM Resource Plan, namely cumulative annual energy savings and cumulative annual**
8 **peak demand savings. Please clarify the frequency of the proposed measurement,**
9 **evaluation and verification activities to quantify these TPIs.**

10
11 Response IR-23:

12
13 ENS is proposing eight Performance Indicators for annual reporting as provided in the
14 Application Evidence, page 48, Figure 4.2. Figure 4.2 also identifies cumulative annual energy
15 savings and cumulative annual peak demand savings as the proposed Performance Targets over
16 2016-2018. As stated in the Evidence, page 46, line 25, the Performance Targets are proposed as
17 the three-year total and would therefore be assessed once at the end of the contract. Progress
18 towards the Targets would be reported annually.

19
20 For 2016-2018 savings measurement, ENS would continue to track energy savings as they occur
21 throughout the year. ENS would continue to retain a third-party evaluation consultant to quantify
22 net energy and peak demand savings annually. For all previous years of DSM, the UARB has
23 retained a savings verification consultant to verify savings annually; any future savings
24 verification and its frequency would be at the UARB’s discretion.

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Request IR-24:

Reference: EfficiencyOne, Evidence - Page 7:

Please provide anticipated energy savings, demand reductions and program administrator costs for all sub-components in the approved 2015 DSM Resource Plan.

Response IR-24:

Please refer to the table below.

2015 DSM Plan	Investment (\$M) ^a	Target Energy Savings (GWh)	Target Demand Savings (MW)
RESIDENTIAL PROGRAMS AND COMPONENTS			
Efficient Product Rebates	5.7	15.5	2.3
Instant Savings	4.1	12.0	1.7
Appliance Retirement	1.5	3.5	0.6
Existing Residential	9.5	26.9	6.2
Home Energy Assessment	1.4	2.7	0.6
Residential Direct Install	6.6	20.0	4.6
Solar	0.2	0.2	0.0
Rental Properties and Condos	0.9	2.7	0.5
Green Heat	0.5	1.3	0.6
New Residential	1.3	3.0	0.8
Energy Savings Actions	1.2	15.4	0.0
Residential Subtotal	17.6	60.8	9.3
BUSINESS, NON-PROFIT AND INSTITUTIONAL PROGRAMS AND			
Direct Installation	6.0	13.0	2.8
Custom Incentives	5.8	20.5	2.1
Custom Retrofit	3.6	16.1	1.6
New Construction	0.5	0.0	0.0
Energy Management Information Systems	0.6	1.9	0.2
Key Accounts	0.8	0.0	0.0
Existing Building Commissioning	0.4	2.4	0.2
Efficient Product Rebates	6.0	27.0	7.0
BNI Subtotal	17.8	60.5	12.0
Programs Total	35.5	121.2	21.2
ENABLING STRATEGIES			
Education & Outreach	1.6	0.0	0.0
Development & Research	1.7	0.0	0.0
Other Enabling Strategies	0.3	0.0	0.0
Enabling Strategies Subtotal	3.5	0.0	0.0
Total	39.0	121.2	21.2

^aCurrency is expressed in 2015 dollars.

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Request IR-25:

For the 2015 DSM Resource Plan and for the proposed 2016-2018 DSM Resource Plan:

(a) Please indicate which programs and sub-components receive funding from rate payers as well as the government or other entities. Please break out the division of funding by source and sub-component.

(b) Please list individually, the total costs for these programs and sub-components with and without non-ratepayer funding sources.

Response IR-25:

a) ENS does not have confirmed contracts with the Province of Nova Scotia for programs or program components for the 2015-2016 Government fiscal year or for 2016-2018 except for the Low Income Homeowner Service, which is no longer being administered through ratepayer-funded DSM programs.

b) As ENS does not have confirmed external contracts for these time periods, program and component-level investment include ratepayer-funded proposals only.

For the 2015 DSM Resource Plan investment by program and component, please refer to EfficiencyOne's response to NSPI IR-24.

For the 2016-2018 DSM Resource Plan total proposed investment by program and component, please refer to the table on the following page.

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2016-2018 Total	Investment (\$ million)^a
Residential DSM Programs	
Efficient Product Rebates	7.8
Instant Savings	4.4
Appliance Retirement	3.5
Existing Residential	40.3
Home Energy Assessment	14.2
Residential Direct Install	14.4
Solar	3.5
Rental Properties and Condos	3.2
Green Heat	5.1
New Residential	5.3
Business, Nonprofit and Institutional Programs	
Efficient Product Rebates	20.2
Custom Incentives	24.7
Direct Installation	12.1
Enabling Strategies	
Education and Outreach	5.1
Development and Research	3.6
Other Enabling Strategies	2.2
Total	121.5

^aProgram totals may not add due to rounding

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Request IR-26:

Reference: EfficiencyOne, Evidence - Page 33, Lines 23-24:

E1 states that “it is not cost-effective to reduce ENS and industry capacity now only to rebuild it in the future.”

(a) Please provide all analysis in support of this statement.

(b) Please discuss mitigation measures E1 has considered as a means of preserving industry capacity if programs are set at a lower level.

(c) Please elaborate on what factors or variables would result in it not being cost effective to reduce the total size of the program if the program had to be increased in the future?

Response IR-26:

a) Please refer to the Application Evidence, pages 32-33.

b) Please refer to the Application Evidence, pages 39-42. ENS initially modelled a plan based on its 2014 level of activity at an investment level in the high \$40 million to low \$50 million range. Based on NSPI’s analysis of system requirements, ENS developed its proposed Plan at a lower investment level (\$27.9 million less over three years compared to ENS’s initial modelling) to address short-term affordability while maintaining industry capacity. ENS did not develop further lower investment scenarios as part of its 2016-2018 DSM Resource Plan development process so did not consider additional mitigation measures.

c) Please refer to the Application Evidence, pages 32-33.

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Request IR-27:

Reference: EfficiencyOne, Evidence - Page 34, Lines 4-5:

E1 states that “maintaining current DSM levels has the additional benefit of providing DSM-related rate stability over time.”

Please reconcile this statement with the fact that no DSM costs are presently included in customer rates.

Response IR-27:

Over the planning timeframe, NSPI’s 2014 IRP Preferred Resource Plan identified the Candidate Resource Plan with a mid-level DSM (approximately 170 GWh savings per year and \$60 million investment per year for 2016-2018) as having the lowest net present value over the 25-year planning horizon. As indicated by the IRP, if DSM has to ramp up in the future to allow NSPI to meet Nova Scotia’s electricity requirements while avoiding higher-cost additional capital expenditures, maintaining the DSM activity proposed in Efficiency Nova Scotia’s 2016-2018 DSM Resource Plan diminishes the potential for significant future DSM-related rate increases and largely retains Nova Scotia’s current service delivery capacity for energy efficiency.

In addition, the UARB’s January 22, 2014 Decision on the 2014 DSM Cost Recovery Rider (DCRR) Application (M05985) approved a \$53.6 million DCRR for 2014. Amendments to the *Public Utilities Act* in 2014, with implementation in January 2015, had the effect of embedding the revenue requirement for DSM in the overall energy charge for Nova Scotia Power customers. This represented a change from practice in 2010-2014, during which an energy efficiency charge was broken out as a separate line item on customers’ bills. The amendments to the *Public Utilities Act* also resulted in payments which would have been collected from NSPI customers for DSM in 2015 being deferred, with payment beginning in 2016.

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1 All else being equal, these amendments would have caused a reduction in bills in 2015 to
2 customers by \$53 million, varying by customer class. The UARB's Decision regarding the
3 collection of under-recovered fuel adjustment mechanism (FAM) costs approved repayment
4 using the \$53 million offset created as a result of the 2015 DSM deferral. Other offsets to the
5 \$100 million FAM under-recovery include \$33 million in 2014 over-earnings by NSPI (UARB
6 Decision M06475, dated November 25, 2014) and \$5 million in disallowed costs (UARB
7 Decision M06290, dated January 20, 2015). With these contributions to the FAM under-
8 recovery, ENS expects the FAM under-recovery balance to be largely repaid in 2015.

9
10 The 2015 DSM level of activity is \$39 million, as approved by the UARB in its September 8,
11 2014 Decision on the 2015 DSM Resource Plan (M06247). Of the 2015 DSM expenditure, the
12 \$35 million to be recovered from ratepayers will be amortized over 8 years, beginning in January
13 2016.

14
15 The annual revenue requirements associated with DSM for each of the years 2016, 2017 and
16 2018 aligns with the DSM revenue collected in each of years 2011 to 2013 of \$42 million to \$46
17 million. Considering that the \$53 million approved for DSM in 2014 rates has been embedded in
18 NSPI electricity rates and repurposed in 2015 as a one-time offset of FAM costs, this \$53 million
19 more than covers the DSM Resource Plan's annual investment for 2016, 2017, and 2018 together
20 with the annual amortized cost of 2015 DSM for these years. This investment can be made
21 without DSM putting pressure on overall electricity rates.

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Request IR-28:

Reference: EfficiencyOne, Appendix A – 2016-2018 DSM Resource Plan – Page 23, Lines 25-27:

E1 states that changes in IT systems will “also enhance ENS’s tracking of customer data for the purposes of its rate and bill impact analysis.”

(a) Please elaborate and explain what additional information is anticipated to become available.

(b) Will this information be provided in future filings? If no, why not?

(c) Did the deficiency in the IT systems, addressed by this expense, prohibit E1 from effectively tracking customer participation and DSM savings in the past?

(d) What expense was incurred to make this change in IT systems?

Response IR-28:

a) No additional information will be available. The enhancements will make the reporting process more efficient by reducing the amount of manual effort to summarize and consolidate customer participation data.

b) Please refer to part a).

c) Customer participation and energy savings have been tracked effectively in the past, as evidenced by the evaluation and verification of tracked energy savings results. Enhancements will provide more automation and make participation data more easily

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- 1 accessible to qualified staff through improved database architecture and reporting
2 functionality.
3
4 d) Expenditures for the change have not yet been incurred.

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Request IR-29:

Reference: EfficiencyOne, Evidence – Appendix D 2016-2018 Rate and Bill Impact Analysis:

E1's rate and bill impact model does not factor in any lost revenue recovery:

(a) Please explain the rationale for excluding this factor from E1's Rate and Bill Impact Analysis.

(b) Please provide an estimate for the rate impacts of the proposed plan, if the lost revenue recovery factor is included in the rates analysis.

Response IR-29:

a) In its feedback on ENS's rate and bill impact analysis, provided on February 13, 2015, NSPI requested that ENS account for lost contribution to fixed costs.

As stated in the 2016-2018 DSM Resource Plan, Appendix D, page 2, lines 9-12, EfficiencyOne was unable to incorporate NSPI's feedback due to the timing of NSPI's feedback.

As stated in Appendix D, Attachment 1, pages 13-14 (pages unnumbered), "ENS will examine how lost contribution to fixed costs can be incorporated within future versions of the model."

b) Please refer to part a).

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Request IR-30:

Reference: EfficiencyOne, Appendix I – DSM Screening in Nova Scotia (Dunsky Energy Consulting):

(a) Please explain the absence of any discussion of the non-participant test (rate impact measure (RIM) test).

(b) Does E1 utilize the RIM test in anyway? If yes, does E1 have a threshold level that RIM cannot exceed for each measure? Across all programs within a sector? Across all programs?

(c) Does E1 have sufficient information to demonstrate that the overall set of measures pursued by E1 does not yield a regressive pattern of subsidies, i.e., from lower income customers to higher income customers? If yes, please provide information which supports or refutes this condition.

(d) If it is non-regressive, please provide an empirical demonstration of non-regressivity with regard to customer income beyond merely indicating that the breadth of programs avoids this situation for residential measures.

(e) Please list the measures that yield a regressive pattern of subsidies and provide any available detail as to the extent of such redistribution.

Response IR-30:

a) Mr. Dunsky provided the following response:

The RIM test is generally not considered an appropriate test for screening energy efficiency or demand-side management initiatives. This is largely because the RIM test reflects a very partial perspective – that of non-participants alone. For

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1 the same reason, the RIM's counterpart – the Participant Cost Test – was similarly
2 not considered among reasonable screening test options.
3

4 b) No.
5

6 c) No.
7

8 d) Please refer to part c).
9

10 e) Please refer to part c).

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Request IR-31:

Reference: EfficiencyOne – Evidence – Page 41, Lines 28-29:

E1 states that it has “worked with Navigant to refine the assumptions of the EL-RAM model to put a greater emphasis on lower first-year unit cost (\$/kWh) programs.” Please elaborate and explain what assumptions were altered, why and what the effects were.

Response IR-31:

The following changes to EL-RAM inputs and assumptions throughout the 2016-2018 DSM Resource Plan development process drove the majority of reductions in first-year unit cost.

- Assumptions relating to the available opportunities for New Home Construction projects were decreased to better reflect opportunities in the Nova Scotian market. New Home Construction was reduced by 22 GWh (investment reduced by \$5.0 million) over the 2016-2018 period. This change was made to better reflect the number of forecasted new housing starts in Nova Scotia.
- The Demand Response program was removed from the portfolio. This change supported ENS’s efforts to focus on low first-year unit cost programs as well as a lack of assumptions on which to plan program development (Please refer to EfficiencyOne’s response to NSPI IR-12 part c). This removal resulted in an investment reduction of \$12.4 million for the 2016-2018 period. No assumptions were modified to produce this change; the program was removed from the model.
- Assumptions relating to measure uptake within the Existing Residential program were modified to prioritize lower first-year unit cost measures. This change resulted in a decrease in unit cost for the program of \$0.18 per kWh. Energy savings for the 2016-2018 period for this program increased by 33.3 GWh.
- BNI programs were prioritized in plan development via changes in assumptions relating to measure uptake, in an effort to prioritize lower unit cost BNI programs. As a result,

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1 BNI energy savings as a percentage of total energy savings over the 2016-2018 period
2 increased from 50 percent to 57 percent.

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Request IR-32:

- (a) Please explain in detail how new codes and standards are included in, or affect, E1's long term planning.**
- (b) Have past energy/demand savings figures been amended for subsequently adopted codes and standards? If yes, please provide the details. If no, why not? (For context, E1 would have had provided incentives for CFLs under lighting programs prior to legislation phasing out incandescent light bulbs.)**

Response IR-32:

- a) The long-term planning ENS engages in is NSPI's Integrated Resource Planning process, to which ENS provides DSM-related information and details. ENSC's recent DSM Potential Study, filed with the UARB on January 14, 2014 and used by NSPI in the IRP, accounted for the potential from codes and standards.¹ Achievable potential from DSM programs was net of these codes and standards.

Codes and standards are included within Navigant's EL-RAM modelling, which was used to develop the DSM Potential Study. The effects to measure savings are in the form of time vectors, where a specific code or standard is associated with the measures it is expected to affect. The measure effect is in the form of a percent change in savings starting at the point from which the code or standard goes into force. For example, if a specific code or standard effectively reduces savings by 50 percent starting in the year 2015, the DSM measure's annual incremental savings would be 100 percent of the first-year savings for each year before 2015. Starting in 2015, the program administrator's share of the measure savings would be reduced by 50 percent over the remainder of the measure life, with the other 50 percent being attributed to the code or standard.

¹ Navigant Consulting. (2014). *Nova Scotia DSM Potential Study*. Filed by Efficiency Nova Scotia Corporation, January 14, 2014. M05522. p. 28.

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1
2 b) Yes, in ENSC's DSM Potential Study. By utilizing the codes and standards time vector
3 detailed above, the energy and demand savings are amended once the standard or code
4 comes into effect. For example, savings achieved from the replacement of incandescent
5 bulbs by CFLs were greater prior to 2014 and the phase out of certain incandescent bulbs.
6 The codes and standards vector mimics the phase out, with lower CFL savings in 2014
7 and beyond.

8
9 Codes and standards adopted after initial implementation also affect savings calculations
10 for measures to which dual baseline assumptions apply (in particular, measures in the
11 Custom and BNI Direct Installation programs). In these instances, full savings are
12 attributed to measure replacements until the estimated end of the useful life of the
13 replaced measure. After the end of the useful life, savings are reduced to the delta
14 between the new measure and the new standard baseline of measures in the market.

15
16 ENS's 2016-2018 DSM Resource Plan presents 2016 and beyond energy savings only;
17 no past energy and demand savings have been included.

18
19 When new codes or standards are put in place, savings from either past DSM or past
20 codes and standards still exist on the electricity system and should not be revised.

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Request IR-33:

Reference: EfficiencyOne, Appendix F - Balanced Plan Principles (Dunsky Energy Consulting) – Pages 3 and 6:

Mr. Dunsky states that E1 “devote(s) resources to some higher risk long term efforts.” On page 6, Mr. Dunsky states “risk minimization” as a consideration. Please explain and reconcile these two planning considerations and provide details related to E1 proposed 2016-2018 DSM Resource Plan.

Response IR-33:

The following response was provided by Mr. Dunsky:

It is entirely consistent for any business with a long-term perspective to develop strategies both to minimize some risk, e.g. through product and service diversification, and to take on some risk, e.g. in strategic areas where the potential for long-term rewards warrant. For example, most utilities adopt strategies to minimize risk on their core operations (e.g. by diversifying their supply mix), while at the same time spending limited funds on forward-looking ventures that involve more risk (e.g. RD&D into new generation or transmission technologies, or investments in potentially disruptive technologies). Doing both is critical to ensuring a balanced approach, notably between short- and long-term goals.

EfficiencyOne’s proposed 2016-2018 DSM Resource Plan is diversified, addressing all sectors and promoting a portfolio of DSM solutions across all key end-uses. The Plan also sets aside a reasonable investment in “enabling strategies”, i.e. strategies designed to either reduce the longer-term cost of achieving DSM savings (e.g. by preparing a trained workforce that will ultimately require fewer incentives to promote energy-saving technologies, or by encouraging adoption of codes and standards that can eliminate the need for incentives altogether), or replenish the pool of cost-effective savings

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- 1 opportunities (e.g. by identifying, assessing and tracking new technologies that can be
2 built into future plans).

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Request IR-34:

Reference: EfficiencyOne, Appendix I – DSM Screening in Nova Scotia (Dunsky Energy Consulting), Page 6:

Mr. Dunsky states that “...with much of the low hanging fruit already picked, and with a recent resurgence in the adoption of tighter codes and standards, ensuring a proper assessment of the costs and benefits of DSM potential is no longer a luxury.”

(a) Is Mr. Dunsky suggesting that the “low-hanging efficiency fruit” have largely been picked in Nova Scotia and that what remains are high-risk, high-cost measures?

(b) If yes, what criteria for risk-minimization strategy has E1 employed in preparing its proposed 2016-18 DSM Plan?

(c) What “tighter codes and standards” are being adopted in other jurisdictions that are not yet adopted in Nova Scotia? Please provide details by measure, including timing and associated energy savings estimates.

Response IR-34:

a) Mr. Dunsky provided the following response:

No. As indicated in ENSC’s DSM potential study, there remain abundant savings opportunities across Nova Scotia at a cost that is substantially lower than the cost of new supply. This is consistent with findings elsewhere, including Dunsky’s own bottom-up assessments in neighbouring regions.

b) Please refer to part a).

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1 c) Mr. Dunsky provided the following response:

2 As a general rule, product and appliance standards are commonly adopted by
3 federal governments, while codes are adopted by provincial governments. For that
4 reason, a comparison of the energy component of Nova Scotia's building codes
5 with those of each state and province across the continent would be a significant
6 undertaking, and could not possibly be completed within the timeframe for
7 responses to interrogatories.

8
9 Insofar as standards are concerned, there are a number of standards that have
10 recently or are in the process of being adopted in the U.S. that have not yet been
11 adopted in Canada. However, the Canadian government's efforts to harmonize its
12 standards with those of the U.S. has led to a series of proposed amendments that
13 would, broadly speaking, result in adoption of similar standards applicable to the
14 Nova Scotia market. In the residential sector these include refrigerators and
15 freezers, heat pumps, and pool heaters. In the non-residential sector, these include
16 general service reflector lamps, commercial air conditioners and heat pumps,
17 fluorescent lamp ballasts, pre-rinse spray valves, metal halide ballasts, water
18 heaters, small electric motors, and refrigeration systems.

19
20 Note that these coming changes were fully accounted for in ENSC's DSM
21 potential study, i.e. the potential and associated costs are net of anticipated new
22 standards.

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Request IR-35:

Please provide the following information:

	Actual Program Spending including Full HST* (\$M)	Actual Program Spending with HST Adjusted for ITCs (\$M)	Annual Energy Savings (GWh)	Annual Demand Reductions (MW)
2010				
2011				
2012				
2013				
2014**				
2015 (Approved)				
2016 (Proposed by E1)***				
2017 (Proposed by E1)***				
2018 (Proposed by E1)***				

Notes:

*** Per Balance Adjustment filings.**

**** 2014 energy savings and demand savings are evaluated, verification is outstanding.**

***** Currency is expressed in 2016 dollars.**

Response IR-35:

Please refer to the table on the following page.

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1

	Actual Program Spending including Full HST* (SM)	Actual Program Spending with HST Adjusted for ITCs (SM)	Annual Energy Savings (GWh)	Annual Demand Savings (MW)
2010	24.0	23.0	82.5	15.9
2011	40.7	37.0	141.8	28.9
2012	48.0	43.8	158.1	33.8
2013	43.4	39.8	163.2	34.1
2014**	39.0	37.4	151.9	27.1
2015 (Approved)***	39.0	35.8	121.2	21.2
2016 (Proposed by E1)****	38.5	38.5	133.1	20.4
2017 (Proposed by E1)****	40.3	40.3	136.5	21.0
2018 (Proposed by E1)****	42.6	42.6	136.3	21.0

2

3

Notes:

4

* Per Balance Adjustment filings.

5

** 2014 energy savings and demand savings are evaluated; verification is pending. Spending is an estimate.

6

***Spending is an estimate.

7

**** Currency is expressed in 2016 dollars.

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Request IR-36:

Reference: EfficiencyOne, Appendix G – DSM Performance Indicators (Dunsky Energy Consulting):

Please provide responses to the following in connection with Dunsky’s report at Appendix G:

- (a) Did any of the states or jurisdictions researched use performance metrics comparing interim energy savings or program budget expenditures to interim targets? If yes, please identify which states or jurisdictions and provide the details of the performance metrics used by each.**
- (b) Did any of the states or jurisdictions use cost effectiveness (i.e.: the formal California Standard Practice Methodology perspectives) results as a performance metric? If yes, please identify which state or jurisdictions.**
- (c) Please identify the states or jurisdictions, which use “cumulative lifetime savings” as a performance metric.**
- (d) Please explain why were the states of Delaware and New Jersey not included in the sample since they both have third party DSM administration?**
- (e) Please provide information-detailing Ohio as a state with third party DSM program implementation.**
- (f) How many states or jurisdictions, which were included in your research, use program budgets and expenditures as a performance metric? Please identify each state and jurisdiction.**

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(g) Please explain why Ontario was the only Canadian province included in the research sample.

(h) Which states or jurisdictions researched applied performance metrics only at the end of a compliance or target period versus tracking them on an annual or semi-annual basis?

(i) Did any of the researched states or jurisdictions apply any process KPI's such as: timing of processing applications, time to process rebates, or measured installation quality? If yes, please identify which states or jurisdictions and the process KPIs. Were these considered for Nova Scotia?

Response IR-36:

Mr. Dunsky provided the following responses:

a) To our knowledge, none of the jurisdictions reviewed have interim targets. Targets are either annual or cumulative over the contract period.

b) Among our 10 case studies, none have a cost-effectiveness performance target, as defined in the California Standard Practice Methodology. Among the 19 other U.S. jurisdictions with a performance mechanism, as documented in the Edison Foundation's 2013 report (please refer to EfficiencyOne's response to NSPI IR-3), one (New Hampshire) uses a cost-effectiveness test as a performance metric (specifically, for purposes of calculating the Program Administrator's (PAs) performance incentive).

c) Among our 10 case studies, California and Wisconsin are the only two states that include "Cumulative Lifetime Energy savings" as Performance targets *per se*. However, as indicated in our report, several others use metrics for which cumulative lifetime energy savings are a critical input. As a result, half of our 10 case studies use cumulative lifetime energy savings either implicitly or explicitly in their Performance targets.

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1
2 d) As explained in our report (page 8), the choice of the 10 case studies aimed to strike a
3 balance between jurisdictions with a third party DSM administrator and those commonly
4 considered as leaders, even though they may have a different energy efficiency delivery
5 model. This was done in order to present a broader perspective for performance
6 indicators. As a result, our case studies included six third-party program administrators
7 (PAs) and four recognized leaders who are not third-party PAs.

8
9 One additional criterion for selecting the 10 case studies was the level of complexity of
10 performance targets. Among our six PAs, Wisconsin and Ohio have a limited number of
11 performance targets, and adding Delaware and New Jersey would have been redundant
12 since, to our knowledge, those regions only use energy savings targets.

13
14 e) Ohio could be qualified as a hybrid state: some Investor Owned Utilities (IOUs) operate
15 their own DSM programs while American Municipal Power, a non-profit cooperative
16 representing municipally-owned utilities, has a contract with Vermont Energy Investment
17 Corporation for delivering energy efficiency (under the “Efficiency Smart” name) in its
18 member communities. VEIC’s contract with American Municipal Power identifies
19 subscribing-community-specific aggregate MWh net savings goals for the contract
20 period. The goals vary by community, but VEIC receives full compensation for achieving
21 a minimum of 70% of the target kWh savings in each community.

22
23 f) The District of Columbia, Ontario and Vermont use program expenditures as a
24 performance target. In all cases, they are used to determine performance incentives paid
25 out to the Program Administrators.

26
27 g) As indicated in our report (page 8), Ontario is the only Canadian province currently
28 operating under a performance mechanism (apart from Nova Scotia). As such, Local
29 Distribution Companies (LDCs) have specific targets to meet in order to be awarded

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performance incentives. Elsewhere across the country, energy savings targets are used for reporting purposes only, not as part of a performance contract mechanism.

h) For clarity, our report recommended that the cumulative energy and peak demand savings be included as Target Performance Indicators; it did not recommend that ENS should not track and report on annual results. In its Evidence, EfficiencyOne proposed the inclusion of annual incremental energy and peak demand savings in its set of Performance Indicators for annual reporting (page 46, lines 30-31). For information regarding other jurisdictions, please refer to EfficiencyOne's response to NSPI IR-3.

i) Vermont has two performance requirements that could be qualified as "process KPIs":

- 1) A "Service Quality" indicator, consisting of "Achieving 92 or more metric points in the Service Quality and Reliability Plan over the course of the Performance Period"; and
- 2) A "Program Implementation Efficiency - Key Performance improvement" metric, consisting of "meeting all pre-determined milestones on schedule."

Oregon also has a "Customer Satisfaction" metric, defined as: "Based on Fast Feedback results, over the full calendar year, for applicable sectors and programs, Energy Trust should maintain a minimum of 85 percent of customers indicating they are satisfied or very satisfied with: (i) Interaction with program representatives, (ii) Overall satisfaction". As referenced at page 23 of our report, "Customer satisfaction" and "Pipeline of projects" metrics were both considered for Nova Scotia, but in the Other Performance Indicators category. We did not recommend including them as Target Performance Indicators as they are not core to ENS' measured performance; nonetheless, we find that reporting on them could add value in understanding and interpreting the Target Performance Indicator results.

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Request IR-37:

Please provide a breakdown of employees by full-time, part-time and temporary, (historical and forecasted/budgeted) for E1 and ENS (as applicable) for each of the years 2011 to 2018, inclusive.

Response IR-37:

Please refer to the table below for 2011-2015 numbers. 2016-2018 DSM implementation budgets, including the required number of employees for UARB-approved DSM activities, will be developed after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan.

Year	DSM Portion		Total Organization				
	DSM Portion of FTE	DSM Portion (%)	Total Organization (FTEs)	Total Organization (Employees)	Full Time (Employees)	Part Time (Employees)	Casual (Temporary) (Employees)
2011	47.0	79.0%	59.5	60	59	1	0
2012	58.1	74.5%	78.0	80	77	3	0
2013	58.6	70.6%	83.0	83	83	0	0
2014	63.7	73.6%	86.6	88	86	1	1
2015*	59.2	70.1%	84.5	85	84	1	0

*Budgeted

The table above does not include EfficiencyOne's On-Site Energy Managers (OEMs), as these positions are not included in compensation expenses. The cost of OEMs is covered through a combination of incentives and reimbursement by participant organizations at which the OEMs are located. The number of OEMs are presented in the following table.

Year	Number of On-Site Energy Managers
2011	0
2012	1
2013	4
2014	6
2015	5

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Request IR-38:

Please provide the employee turnover rate (both numeric and percentage) for full-time, part-time, and temporary employees of EI and ENS (as applicable) for each of the years from 2011 to 2014, inclusive.

Response IR-38:

Please refer to the table below.

Total Organization Employees*				
Year	Employee Type	Number of Employees		Turnover Rate
		End of year	Left ENSC	
2011	Full Time	59	9	15.3%
	Part Time	1	0	0.0%
	Casual (Temporary)	0	0	N/A
	Total	60	9	15.0%
2012	Full Time	78	13	16.7%
	Part Time	3	0	0.0%
	Casual (Temporary)	0	0	N/A
	Total	81	13	16.0%
2013	Full Time	87	3	3.4%
	Part Time	0	1	N/A
	Casual (Temporary)	0	0	N/A
	Total	87	4	4.6%
2014	Full Time	92	10	10.9%
	Part Time	1	1	100.0%
	Casual (Temporary)	1	0	0.0%
	Total	94	11	11.7%

*Including On-Site Energy Managers

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Request IR-39:

Please provide the total labour cost (actual and forecasted/budgeted) for all employees of E1 and ENS (as applicable) for each of the years from 2011 to 2018, inclusive.

Response IR-39:

Please refer to EfficiencyOne's response to NSPI IR-40.

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Request IR-40:

(a) Please provide the following information on the breakdown of labour costs (actual and forecasted/budgeted) of E1 and ENS (as applicable) for each of the years from 2011 to 2018, inclusive:

- (i) of regular wages;**
- (ii) amount of overtime wages;**
- (iii) amount of benefits;**
- (iv) amount of pension costs;**
- (v) amount of any other (please specify).**

For each of the above items, please provide both overall numbers, totals by year, and by full-time, part-time and temporary employees.

(b) Please provide the historical and forecasted annual spend of E1 and ENS (as applicable) on consultants for each of the years from 2011 to 2018, inclusive.

Response IR-40:

a) Please refer to the table below for 2011-2015 information. 2016-2018 DSM implementation budgets, including payroll and benefits costs based on the number of employees required for UARB-approved DSM activities, will be developed after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan.

Payroll & Benefit Costs - DSM Portion												
Year	Wages		Benefits - Employer Share			Total	Breakdown by Employee Type					
	Regular Wages (\$k)	Overtime Wages (\$k)	Statutory (\$k)	Health & Dental (\$k)	Pension (\$k)	Total Payroll & Benefit Costs (\$k)	Full Time Employees		Part Time Employees		Casual (Temporary) Employees	
							(\$k)	#	(\$k)	#	(\$k)	#
2011 Actual	2,064	-	129	49	66	2,308	2,290	59	18	1	-	0
2012 Actual	3,210	-	193	80	92	3,575	3,530	77	45	3	-	0
2013 Actual	3,613	-	228	103	140	4,084	4,084	83	-	0	-	0
2014 Actual	4,266	-	259	134	162	4,821	4,787	86	28	1	6	1
2015 Budget	4,279	-	236	141	202	4,858	4,825	84	33	1	-	0

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b) Please refer to the table below for 2011-2015 information. 2016-2018 consultant requirements will be based on specific needs identified through annual budgeting processes, which will be determined after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan.

Consultant Costs - DSM Portion	
Year	Consultant Costs (\$k)
2011 Actual	1,016
2012 Actual	826
2013 Actual	760
2014 Actual	855
2015 Budget	680

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Request IR-41:

Please provide the wage rate increases (actual and forecasted/budgeted) of E1 and ENS (as applicable) for each of the years from 2011 to 2018, inclusive. Please include in your response the actual and forecasted/budgeted wage rate increases for each employee classification.

Response IR-41:

Please refer to the table below for 2011 - 2015 information. Wage rate increases, which are the same for all classifications/pay bands, are determined annually based on market considerations. For details, please refer to EfficiencyOne's response to NSPI IR-42.

Wage rate increases for 2016 through 2018 will be determined in accordance with the process set out in EfficiencyOne's Compensation Statement of Practice and Procedure, which is provided in EfficiencyOne's response to NSPI IR-42, Attachment 4.

Wage Rate Increases For All Employee Classifications	
Year	Market Increases
2011	0.0%
2012	2.0%
2013	3.0%
2014	2.5%
2015	2.0%

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Request IR-42:

Please provide copies of:

- (a) all studies, document(s), report(s) or related rationale that was relied upon by E1 or ENS (as applicable) to determine or forecast/budget any wage rate increase(s) for any portion of the period from 2011 to 2018 inclusive; and
- (b) E1's compensation guidelines, policies and procedures.

Response IR-42:

- a) Please refer to the following attachments for documentation for 2011-2015:
- Attachment 1: HayGroup report summarizing projections for 2011-2014;
 - Attachment 2: HayGroup report setting out projections for 2015; and
 - Attachment 3: Statistics Canada report summarizing the Consumer Price Index for Nova Scotia from 2011 to 2014.
- Market wage rate increases for 2016 through 2018 will be determined in accordance with the process set out EfficiencyOne's Compensation Statement of Practice and Procedure. Please refer to Attachment 4.
- b) Please refer to Attachment 4.

Canadian employees to see average salary increase of 2.6 per cent in 2014 according to survey of top employers conducted by Hay Group

Oil and Gas, Services, Credit Unions and Chemicals employees are expected to have the highest increases in 2014; retail and leisure/hospitality workers to receive lowest increases

TORONTO, Aug. 20, 2013 /CNW/ - Canadian employees can expect an average salary increase of 2.6% in 2014, according to a national survey of public and private sector employers conducted by Hay Group.

The projected increase is lower than the projection for 2013 (at 2.9 %) and continues to be relatively close to projected increases of 2.8% for American employees. U.S. average projections are also lower for 2014 than they were a year ago.

Projected increases for Canada continue to be much lower than projected increases of 3.7 % before the 2008/09 economic downturn.

More than 500 Canadian organizations provided details of their planned salary adjustments for 2014 for the Hay Group survey, which was conducted in June and July. Participants include many of Canada's leading employers.

Resource-based provinces continue to lead the rest of Canada

This year, the highest increases are in the Oil and Gas sector at 4% despite the strategic issues in the industry that have caused some moderation in long term investment. Services (at 3.3%), Credit Unions (at 3.2%), Chemicals (at 3.1%) and Utilities (at 3.0%) are also forecasting increases that are higher than the national average. These high forecasts are a continued reflection of the demand for key skills and experience.

Not surprisingly, Newfoundland and Labrador (at 4.0%), Saskatchewan (at 3.4%) and Alberta (at 3.2%), lead the country, buoyed by the demand for key skills in the resource industries despite the challenges in these markets. A clear divide between the provinces continues, with resource-rich provinces coming in between 3.2 - 4.0%, with the rest of Canada predicting increases of 2.1-2.6%, all of them at or below the national average.

Province	2014 projection	2013 projection	2012 projection	2011 projection
BC	2.3%	2.7%	2.5%	2.4%
Alberta	3.2%	3.6%	3.4%	2.9%
Saskatchewan	3.4%	3.2%	3.2%	3.3%
Manitoba	2.6%	2.7%	2.5%	2.7%
Ontario	2.5%	2.7%	2.7%	2.4%
Quebec	2.6%	2.7%	2.8%	2.7%
Maritimes	2.1%	2.6%	2.4%	2.7%
Newfoundland	4.0%	3.4%	3.4%	3.5%
GTA	2.5%	2.8%	2.7%	2.5%

The sectors with the lowest projections for 2013 are Leisure/Hospitality (at 2.0%), Retail, Consumer Durables and Forestry & Paper (all at 2.1%). Overall, the public sector is forecasting noticeably lower salary increases (at 2.3%) than is the private sector (industrial and financial at 2.7%).

Canadians to fare better than some, but well behind other major economies

Canadian projections rank about average against some industrialized nations, above France (at 2.5%); Italy (at 2.2%) and Japan (at 2.0%), but behind others such as the US (at 2.8%) and UK (at 2.9% %). Canada still lags far behind the forecasts for India (at 10.8%), China (9.0%) and Russia (at 8.0%).

Other findings

The survey also included a number of other findings:

- The actual base salary changes realized in 2013 were exactly as forecasted for the industrial (2.9%) and public sectors (2.5%) but lower in the financial sector (2.6% realized against 2.9% forecasted);
- Saskatchewan and Newfoundland - two of last year's biggest winners - have the highest 2014 base salary projections ;
- 2014 projections for Alberta are lower than they were in 2013, but still rank 3rd highest in Canada;
- BC is showing projections lower than last year and below the national average,
- Ontario and the GTA at 2.5% are below the national average;
- 2014 projections for China and Russia, while still much higher than most economies, have moderated between one-half to 1% from those made for 2013, while the projections for India have increased by more than one-half percent over 2013;
- The opportunity to receive short-term incentives has increased for senior and middle management in the private sector, but there are fewer opportunities for employees at the supervisory and clerical levels.

Details of the survey results will be released at a series of breakfast presentations being held in major cities across Canada in September.

About Hay Group

Hay Group is a global management consulting firm that works with leaders to transform strategy into reality. We develop talent, organize people to be more effective and motivate them to perform at their best. Our focus is on making change happen and helping people and organizations realize their potential.

We have over 2800 employees working in 87 offices in 49 countries. Our insight is supported by rigorous data from over 100 countries. Our clients are from the private, public and not-for-profit sectors, across every major industry.

SOURCE Hay Group Limited

Compensation trends and strategies for 2015

Tuesday, October 7, 2014



About Hay Group

Hay Group has consulted with 9,000 clients worldwide in a wide variety of areas, including:

Organizational effectiveness

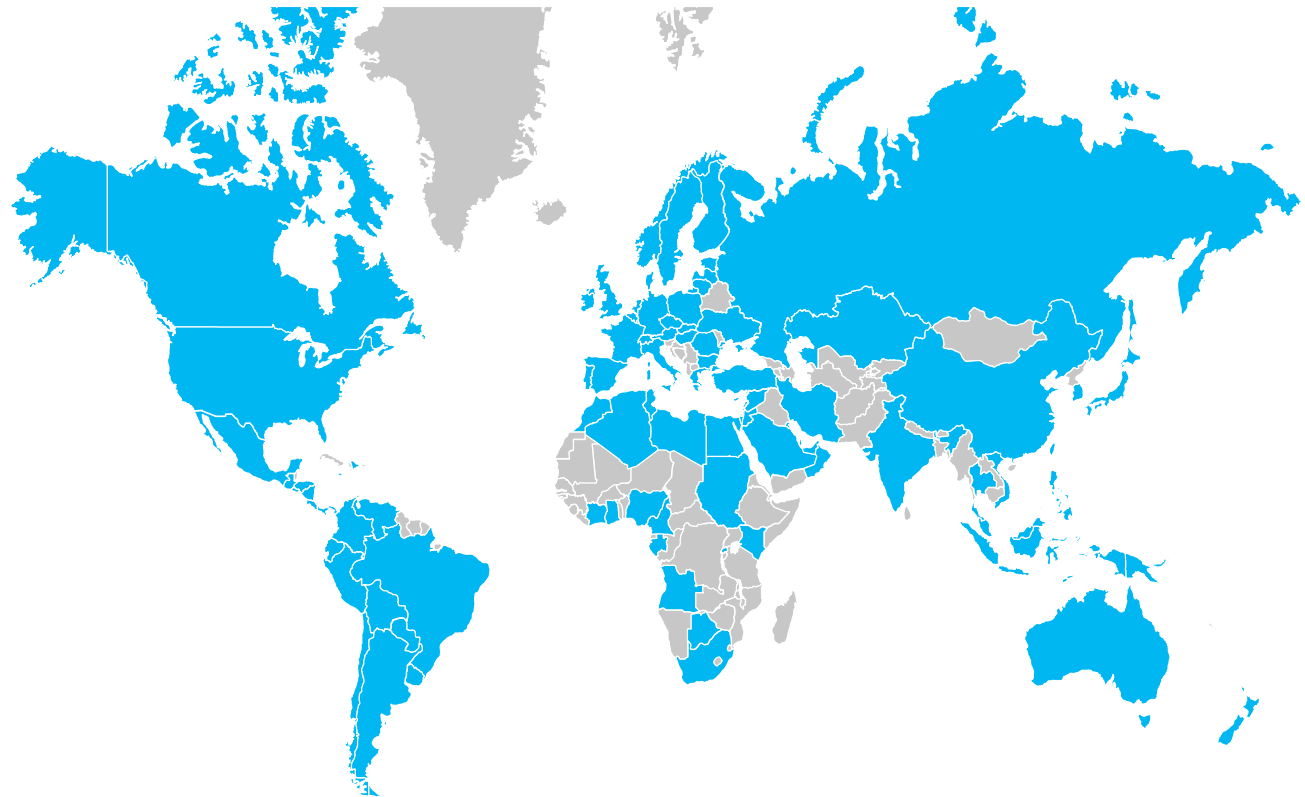
Leadership and executive assessment

Reward strategy

Executive remuneration and corporate governance

Performance Management

Employee engagement



88

Offices in 47 countries

2600

Employees worldwide

9000

International clients

Our presenters



Kevin Slater
Rewards Consultant
Hay Group



Rachel O'Connor
Senior Principal
Hay Group

Agenda

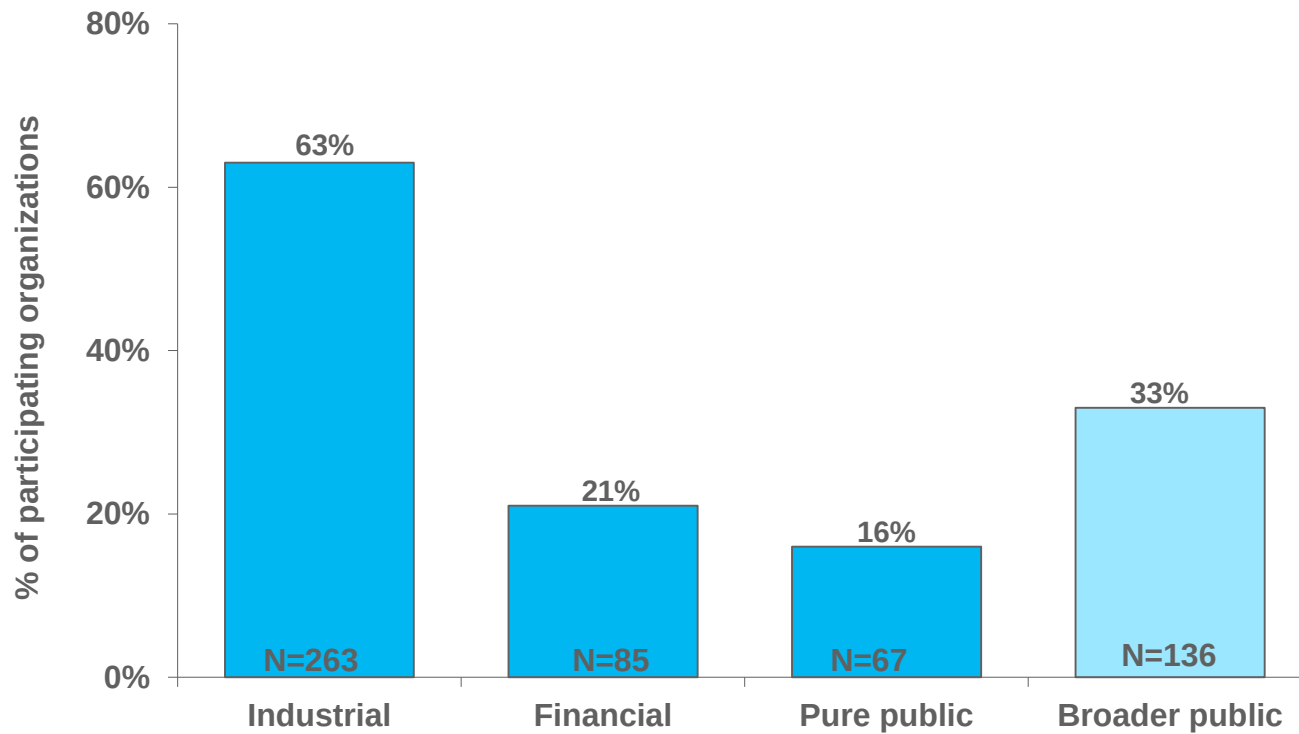
- 1 Salary projections for 2015
- 2 Reward effectiveness and value



Salary projections for 2015

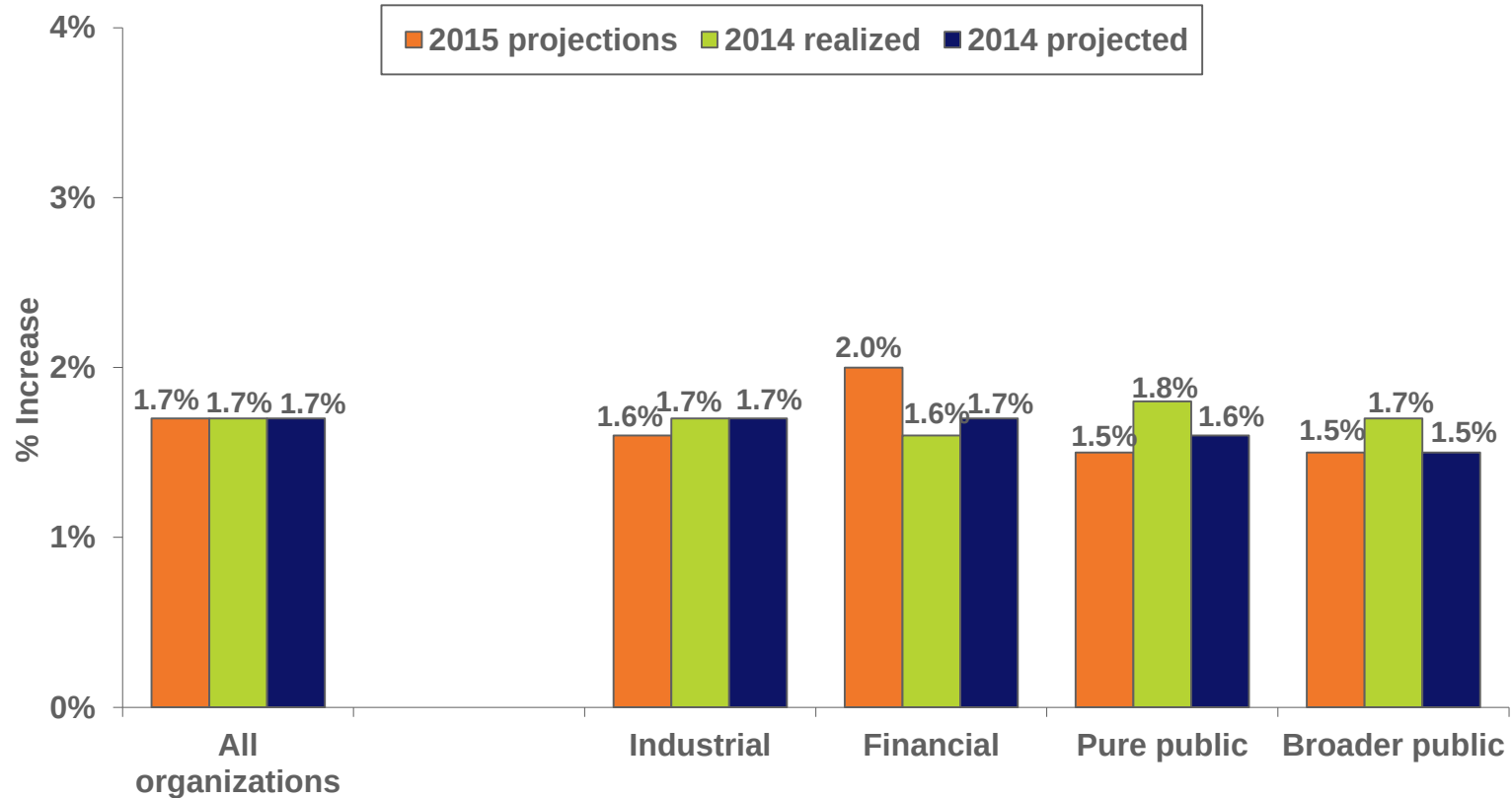
Scope of the survey

415 organizations were surveyed in June and July 2014



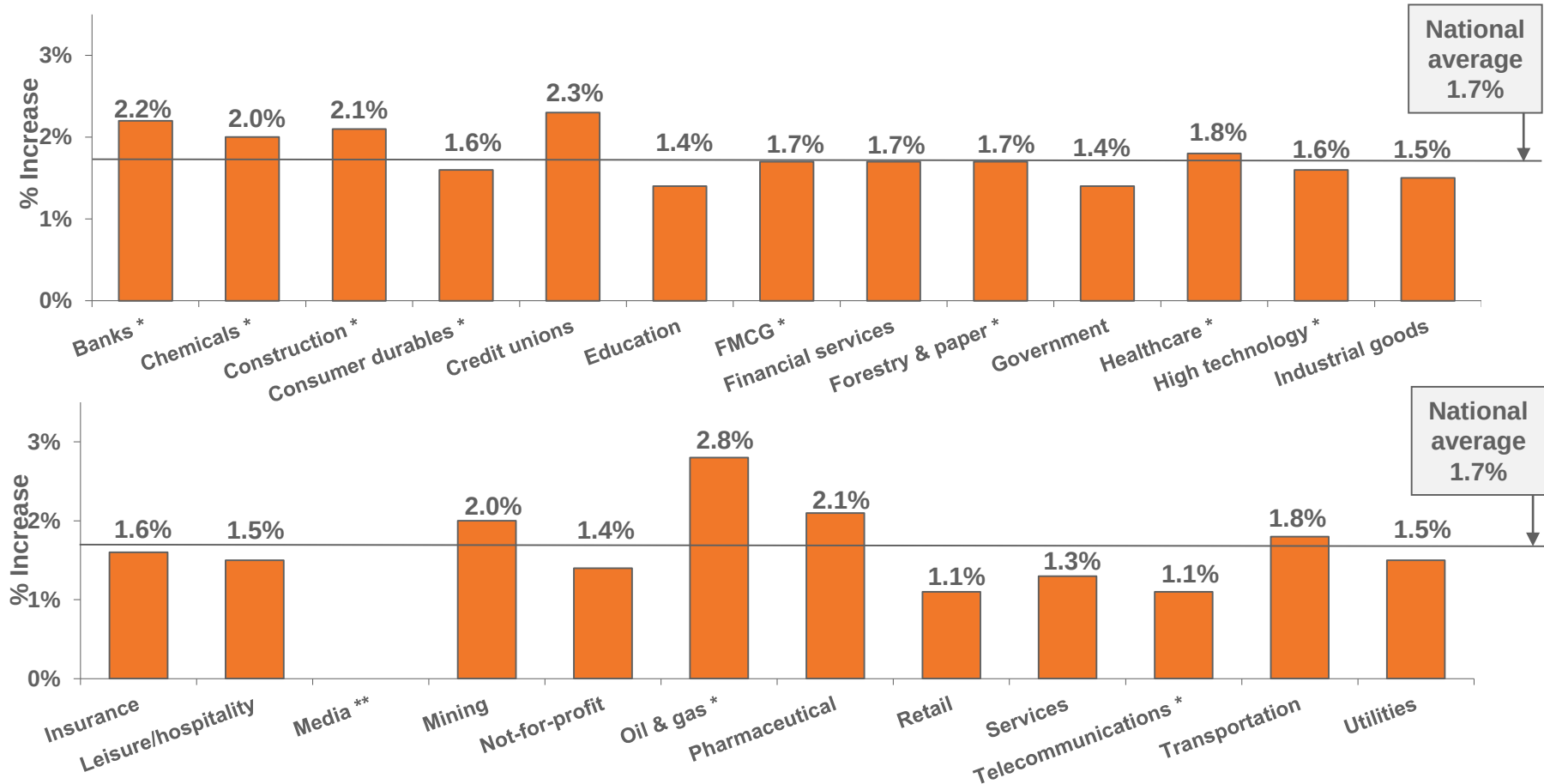
Note: 415 participating organizations is the sum of industrial, financial and pure public only. Broader public is the sum of pure public plus those industrial/financial organizations which also qualify as public organizations.

Range structure movement by sector



Compensation elements: Structure	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Combined	yet approved: Combined
Sector: Separated	Job levels: Combined	Revenue: Combined

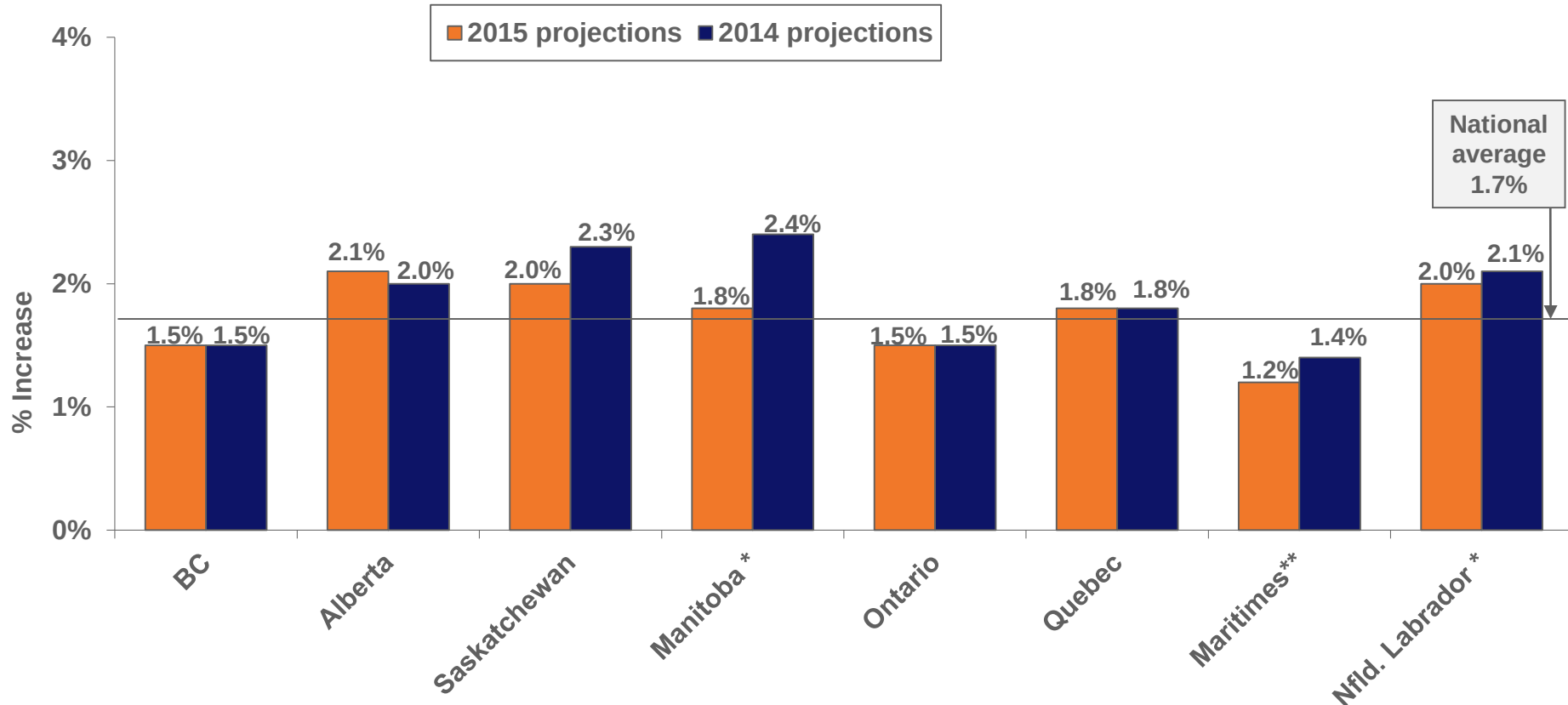
Financials, oil & gas, mining, chemicals, pharma....



Notes: * Less than 10 organizations reporting base salary range projections

** Insufficient data

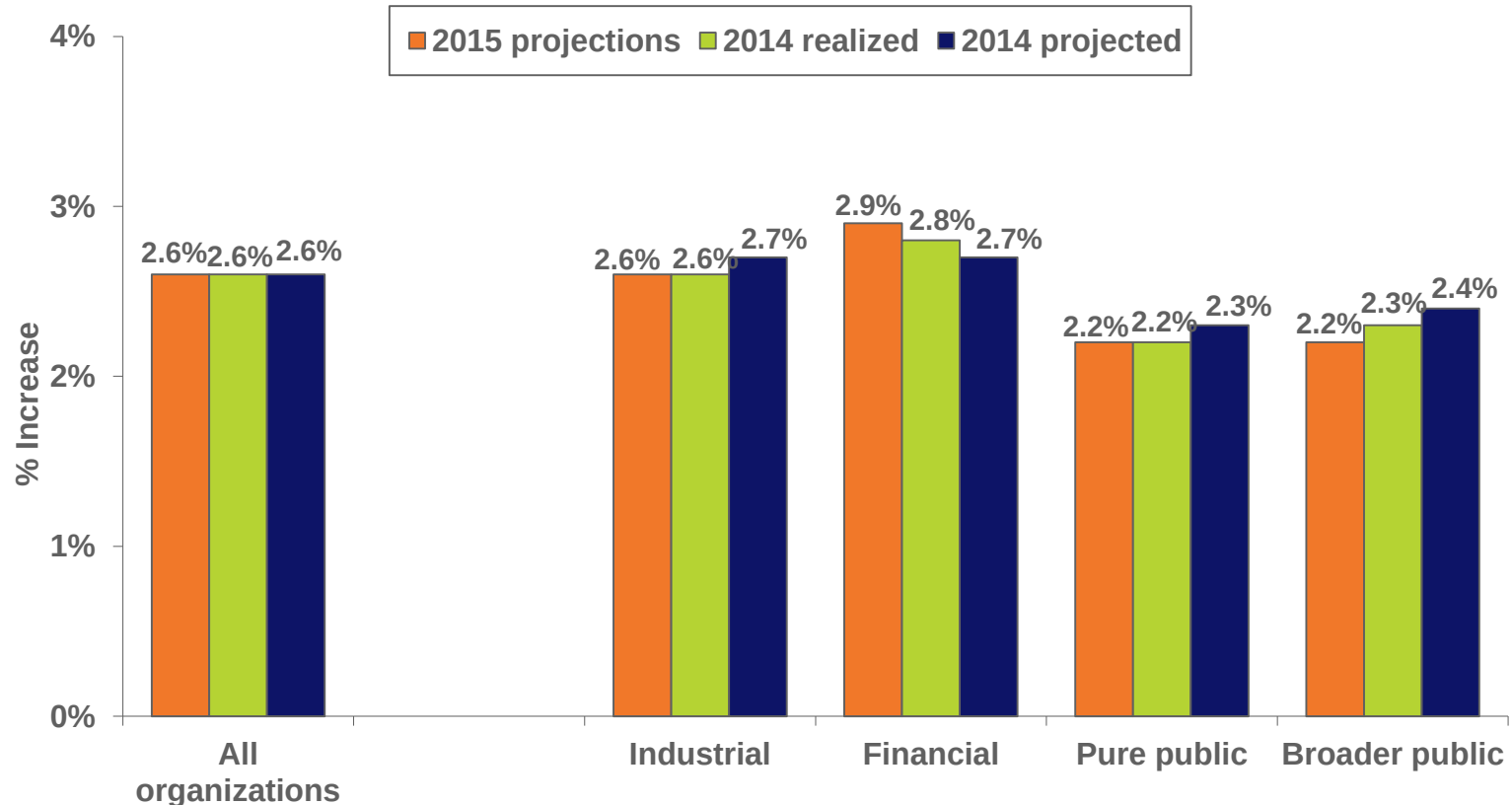
Range structure projections by geography



Compensation elements: Structure	Sub-sector: Combined	Approved & not yet approved: Combined
Including 0%: Yes	Geographies: Separated	Revenue: Combined
Sector: Combined	Job levels: Combined	

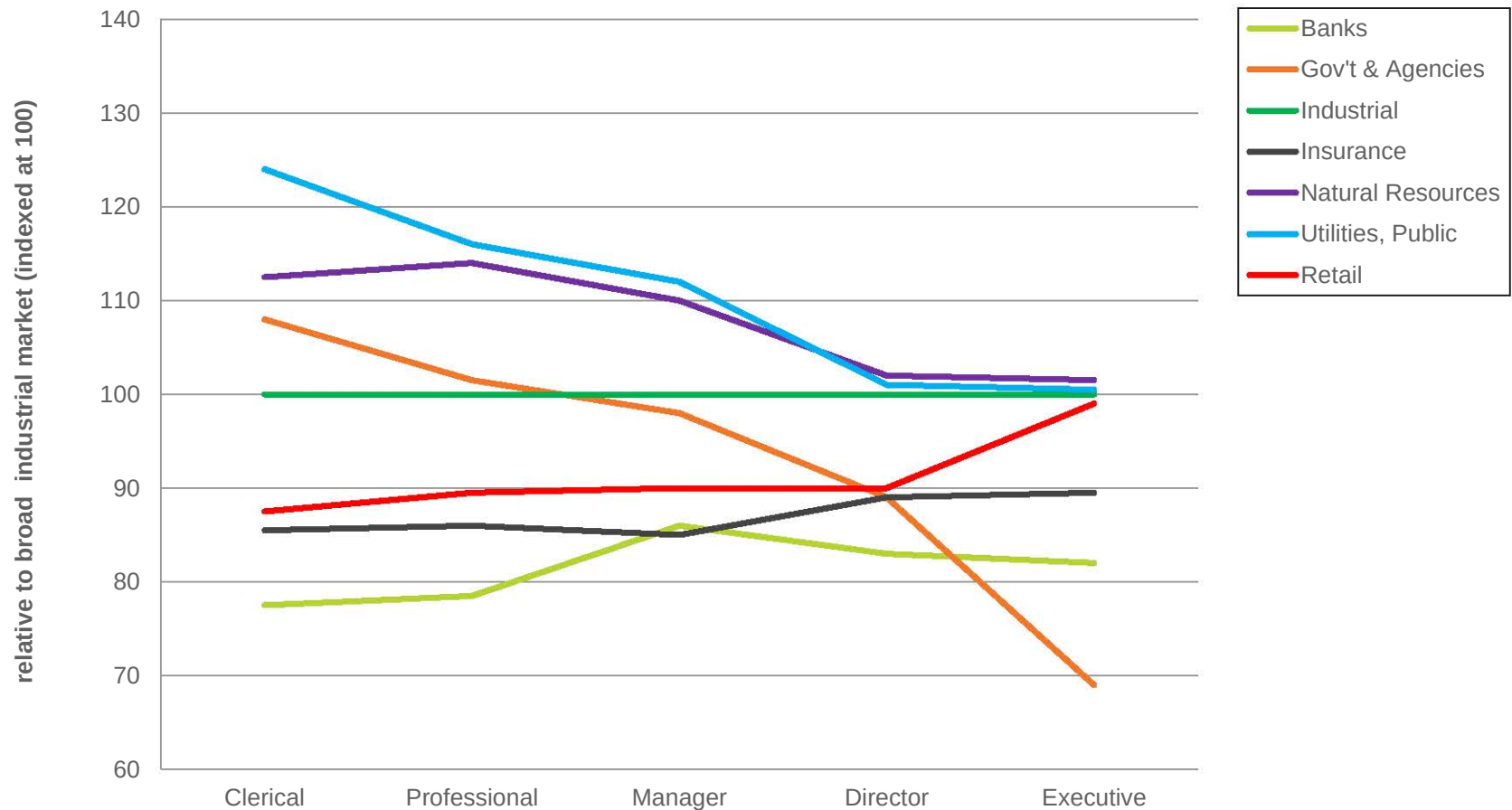
Notes: * less than 10 organizations
 ** Maritimes projections are for NS, NB and PEI

Actual increases exceed range adjustments



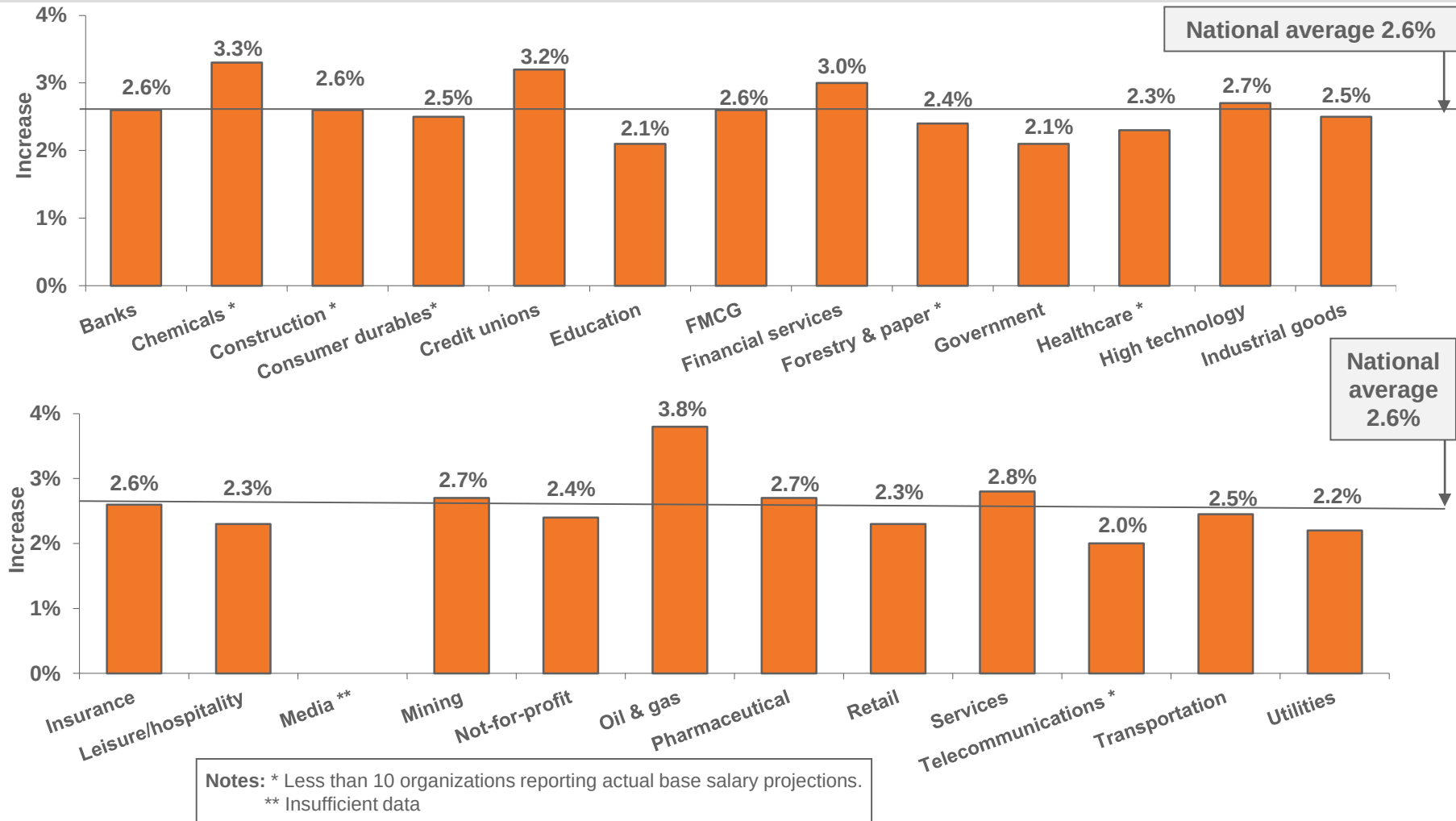
Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Combined	yet approved: Combined
Sector: Separated	Job levels: Combined	Revenue: Combined

Risky pay practices in the public sector?

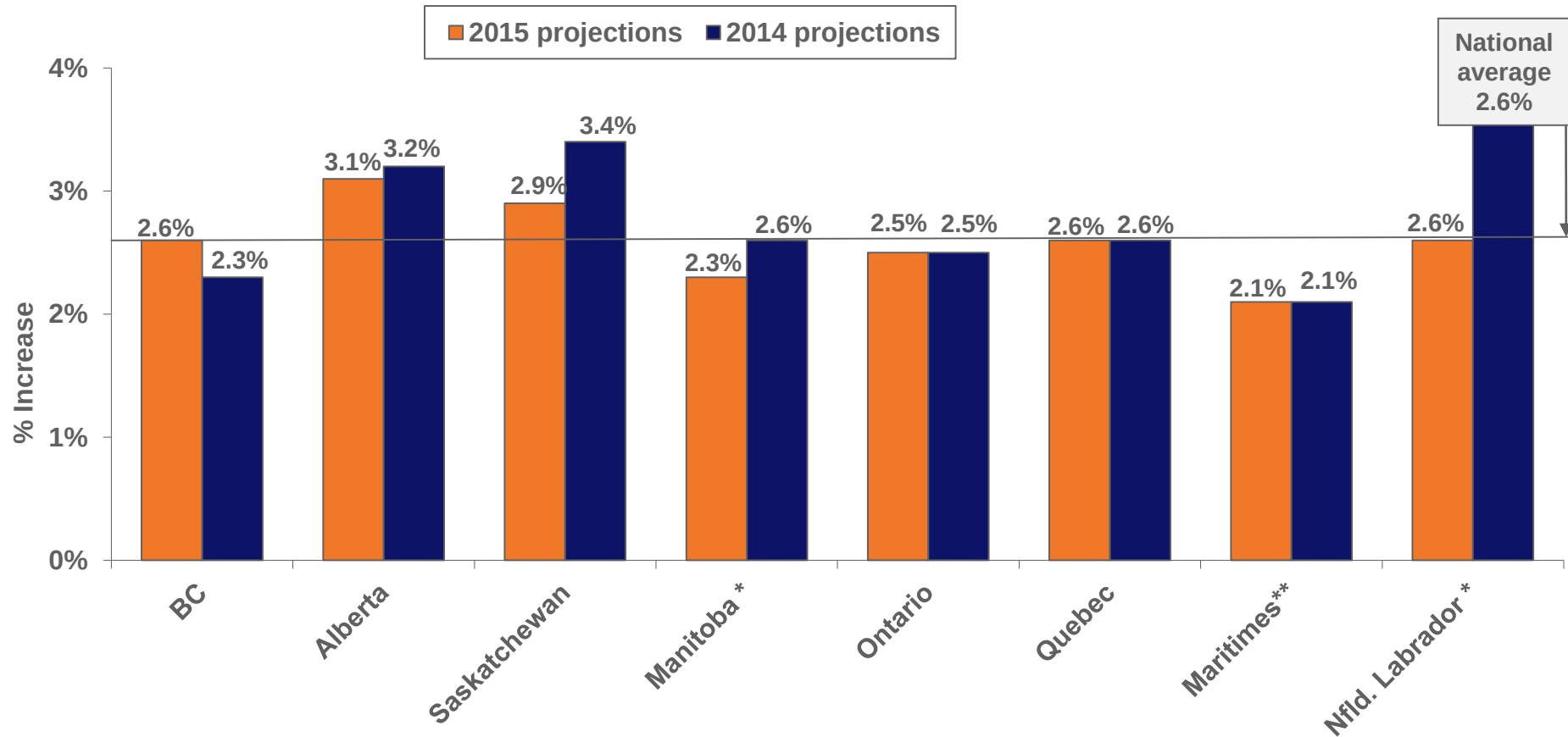


Source: Hay Group PayNet database

Winners are oil & gas, chemicals, financials



Resource rich provinces above average



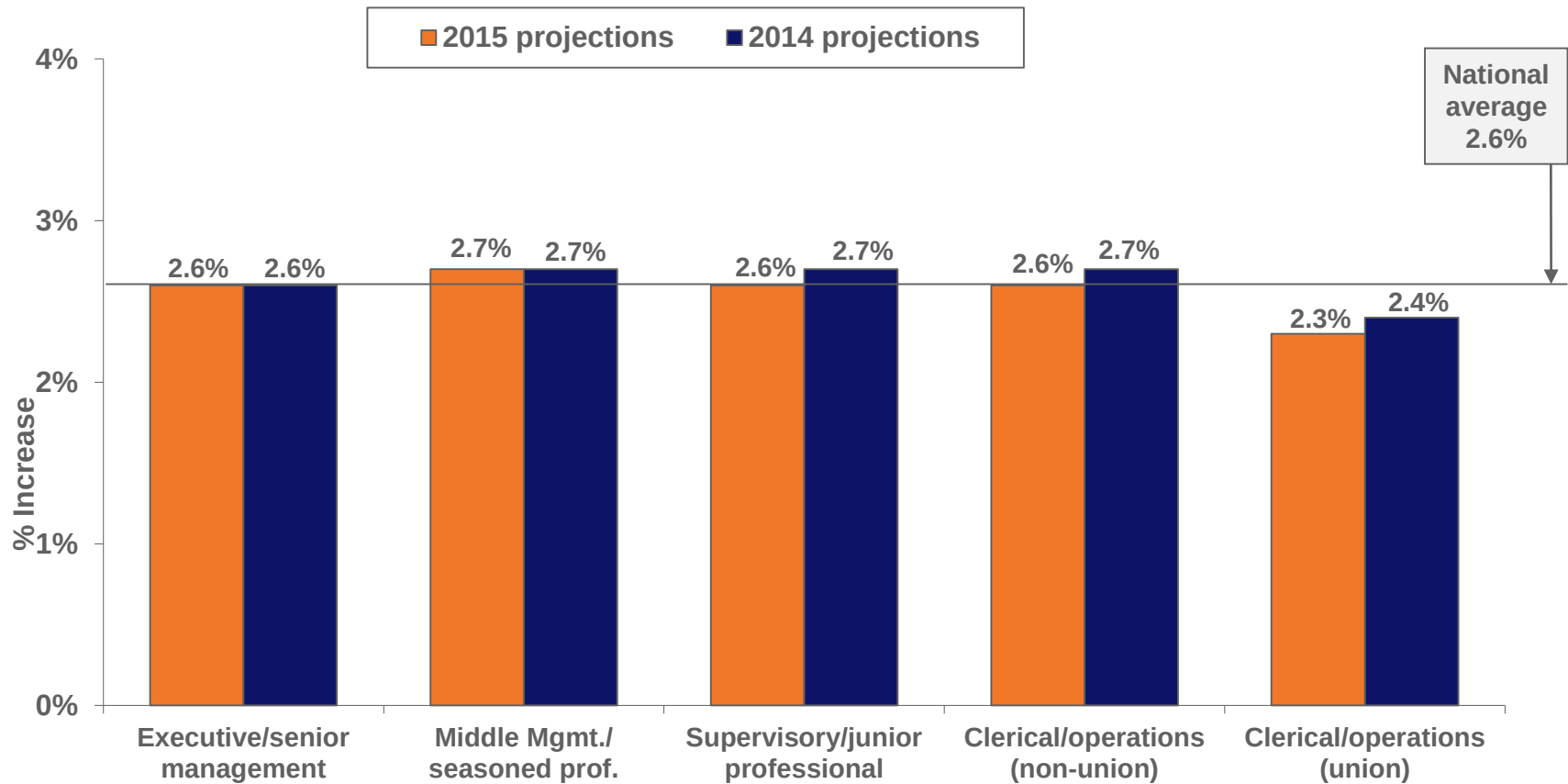
Compensation elements: Salary
Including 0%: Yes
Sector: Combined

Sub-sector: Combined
Geographies: Separated
Job levels: Combined

Approved & not yet approved: Combined
Revenue: Combined

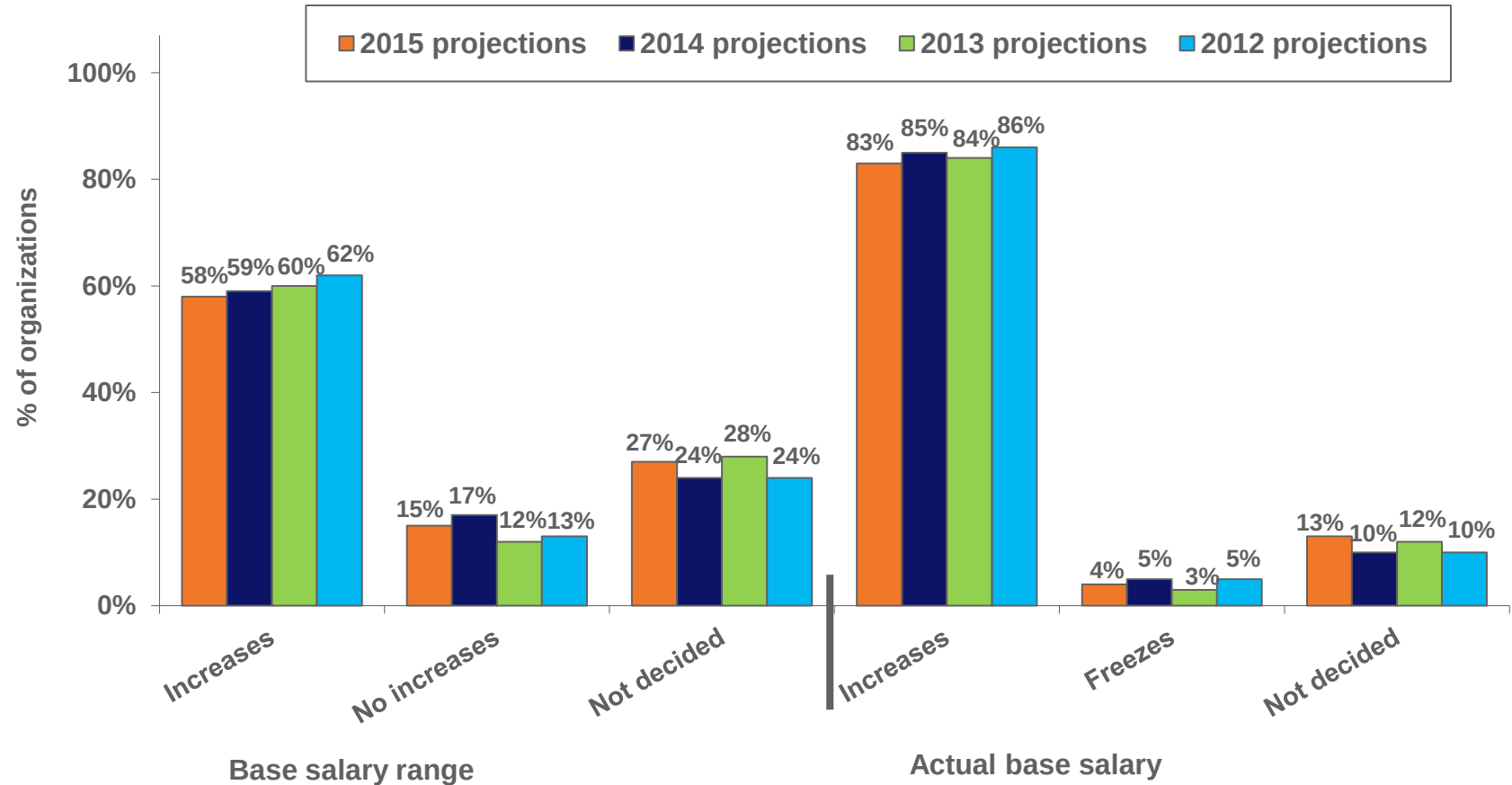
Notes: * less than 10 organizations
** Maritimes projections are for NS, NB and PEI

Overall increases are the same by job level



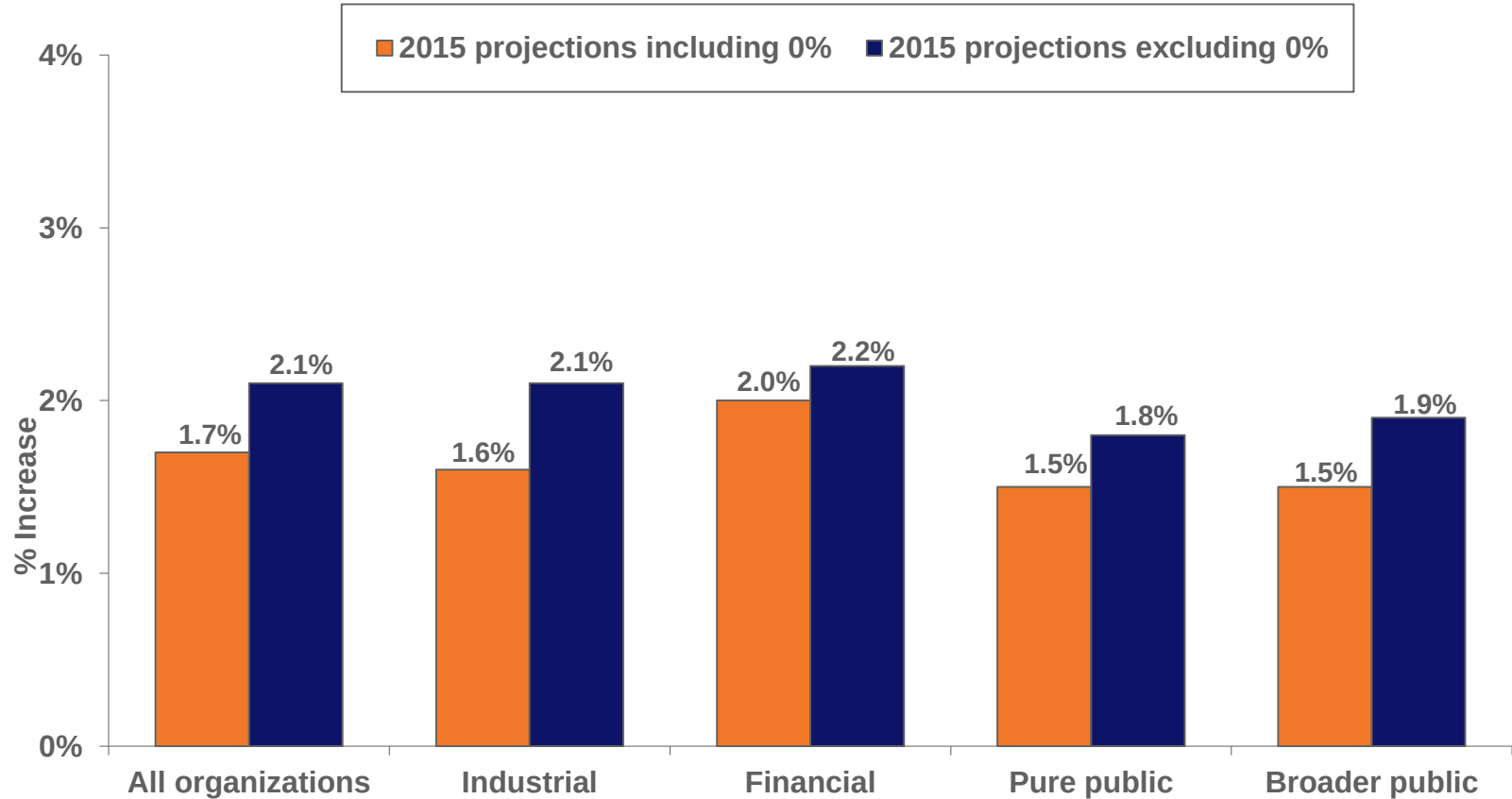
Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Combined	yet approved: Combined
Sector: Combined	Job levels: Separated	Revenue: Combined

National freezes vs. increases



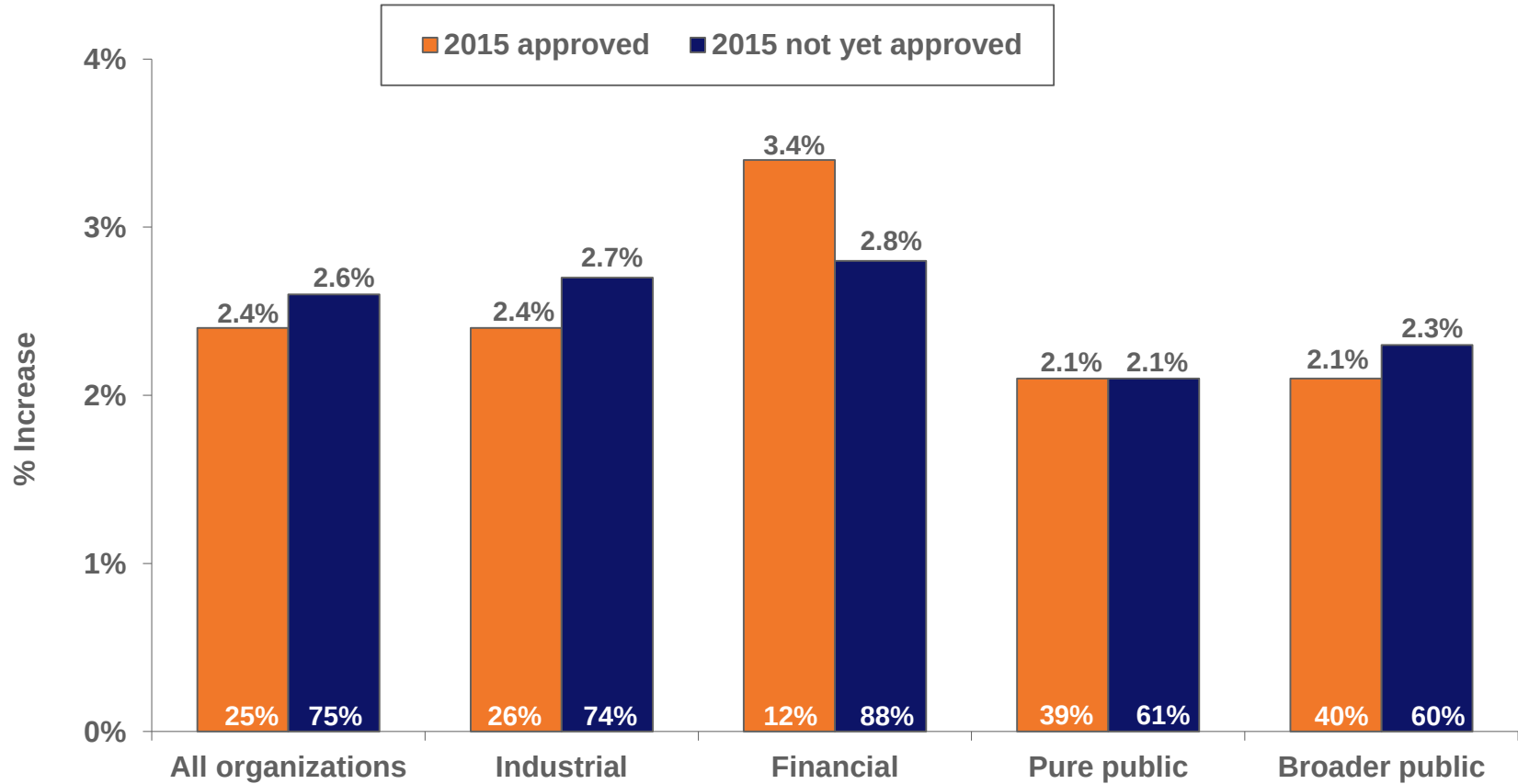
Compensation elements: Structure & salary
Including 0%: Not applicable
Sector: Combined
Sub-sector: Combined
Geographies: Combined
Job levels: Combined
Approved & not yet approved: Combined
Revenue: Combined

Freezes impact salary range projections



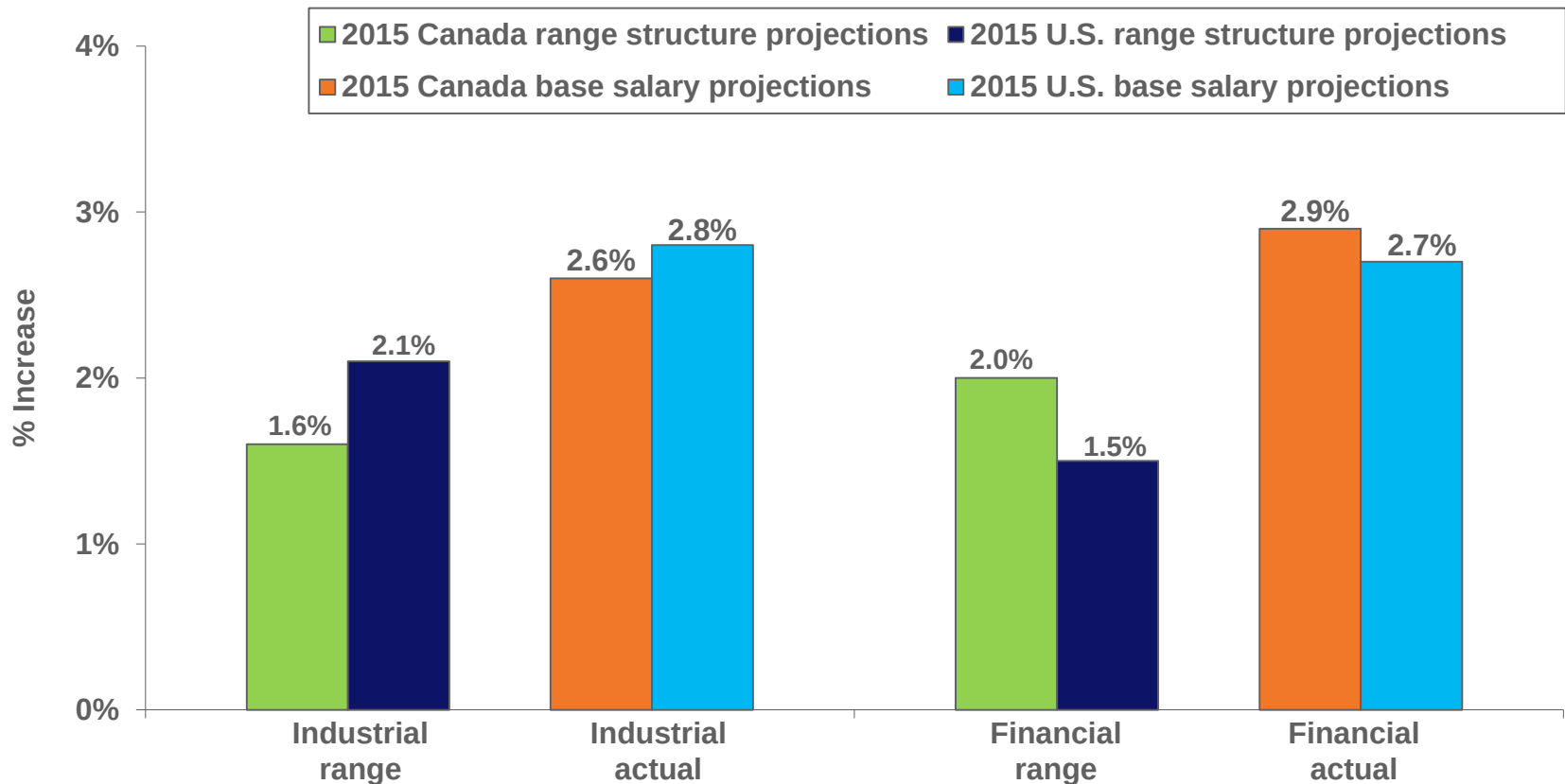
Compensation elements: Structure	Sub-sector: Combined	Approved & not
Including 0%: Yes / no	Geographies: Combined	yet approved: Combined
Sector: Separated	Job levels: Combined	Revenue: Combined

Some differences in approved increases



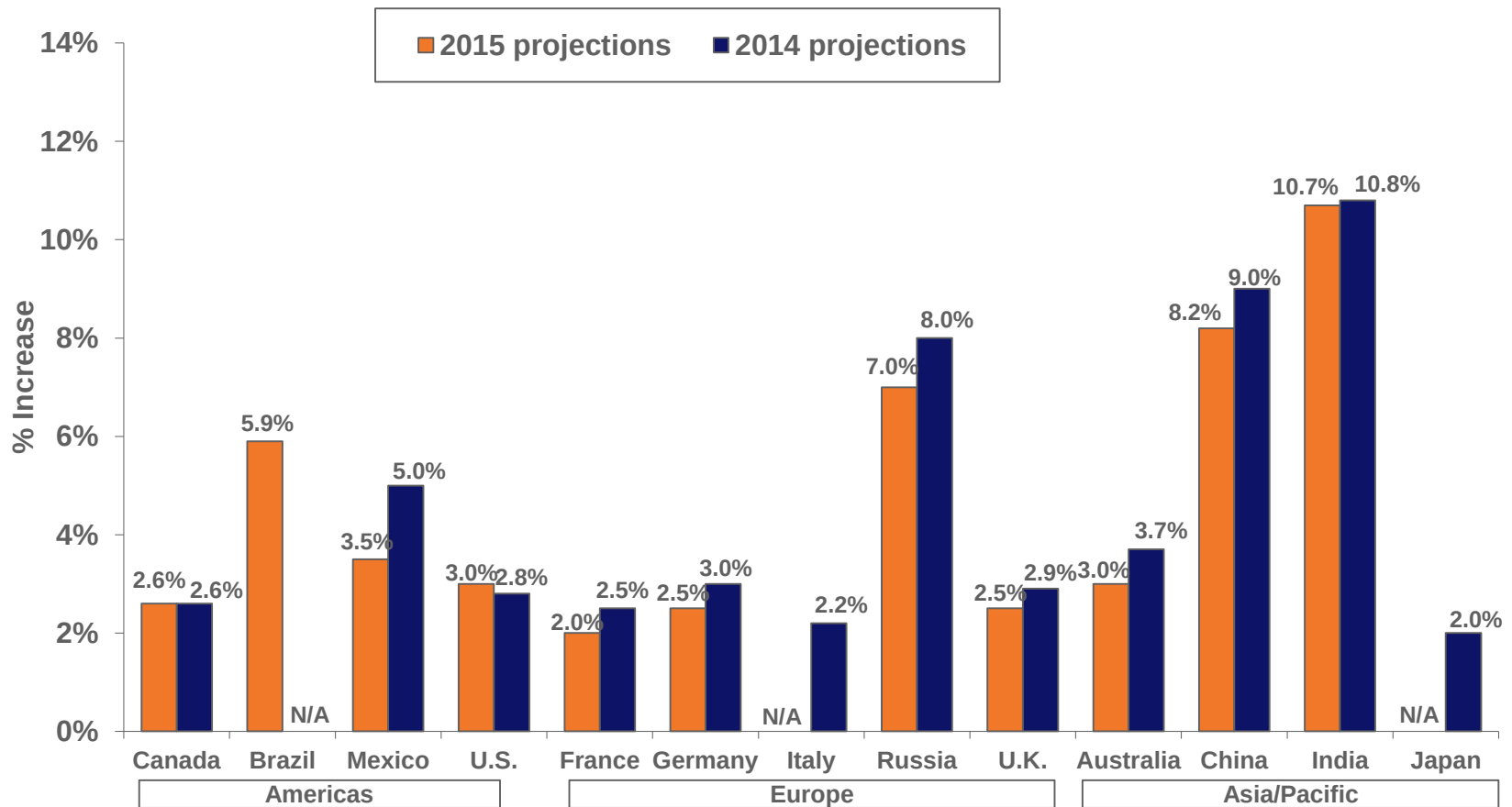
Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Combined	yet approved: Separated
Sector: Separated	Job levels: Combined	Revenue: Combined

What about our neighbours?



Compensation elements:	Structure & salary	Sub-sector:	Combined	Approved & not
Including 0%:	Yes	Geographies:	Combined	yet approved:
Sector:	Separated	Job levels:	Combined	Revenue:
				Combined

Global base salary projections



Source: Hay Group PayNet Landscape



Reward effectiveness and value

Let's start with a story

- No change to overall budget
- Comp decisions rolled out one level lower
- Emphasis on differentiation of performance – in performance measurement and comp outcomes
- Increased retention of HP/HP (increased turnover of lowest performers)
- Improved employee perceptions of reward fairness and value
- Increased management engagement scores



Where are the priorities? Here's what we've heard from you...

Reward

- Benchmarking, benchmarking, benchmarking
- Lesser focus (50-60%) on rewarding performance, defining total rewards, motivating discretionary effort

Leadership

- Much expected but rarely managed in a strategic way
- Limited succession depth and readiness
- Moderate leadership development

People and Engagement

- High awareness of today's state – moderate efforts to impact
- Limited leveraging of managers – empowerment and development to address engagement and people issues

A disconnect?

- Where reward professionals spend much of their time
 - Externally benchmarking reward amounts and design
 - Managing compensation “fairness”
 - Controlling compensation and benefits costs
- What CEOs are demanding
 - Optimizing productivity and cost effectiveness
 - Engaging employees
 - Developing and retaining key talent
 - Aligning human capital and reward with business strategy

Globally, Human Capital is decisively the most important challenge for CEOs—it is either first or second in every region.

There is a clear recognition among CEOs that Human Capital is the engine of the enterprise.

CEO's human capital priorities



We don't help CEOs make the link between Reward and other human capital priorities

It's all connected

Reward is one key facet of human capital management

- So we need to optimize direct Reward ROI

AND it is also an enabler of many others

- So we need Reward that is designed to support
 - Accountability, priorities, efficiency, results
 - Desired culture and values
 - Growth, development, succession
 - Attraction, retention, engagement



9 headlines for effectiveness

- 1 Start with strategy, and keep coming back to it
- 2 Don't leave reward solely to HR – design or implementation
- 3 Use line managers for decisions and communication – process, rationale, outcomes
- 4 Make communication a priority – simple, clear, focused on goals and key messages
- 5 If performance is important in principle, make sure it is in practice too
- 6 Know your value proposition and put it to work
- 7 Make use of all of total rewards – and communicate all of it
- 8 Provide line managers with tools and back up
- 9 Provide executives with resources for accountability, alignment and calibration

Measuring effectiveness

Management is most interested in...

- Link to enterprise and individual performance
- Alignment with strategy and culture
- Support for engagement, retention, motivation

Least interested in...

- Total cost vs. competitors
- Comparisons to “best practice”

Measurement today is limited

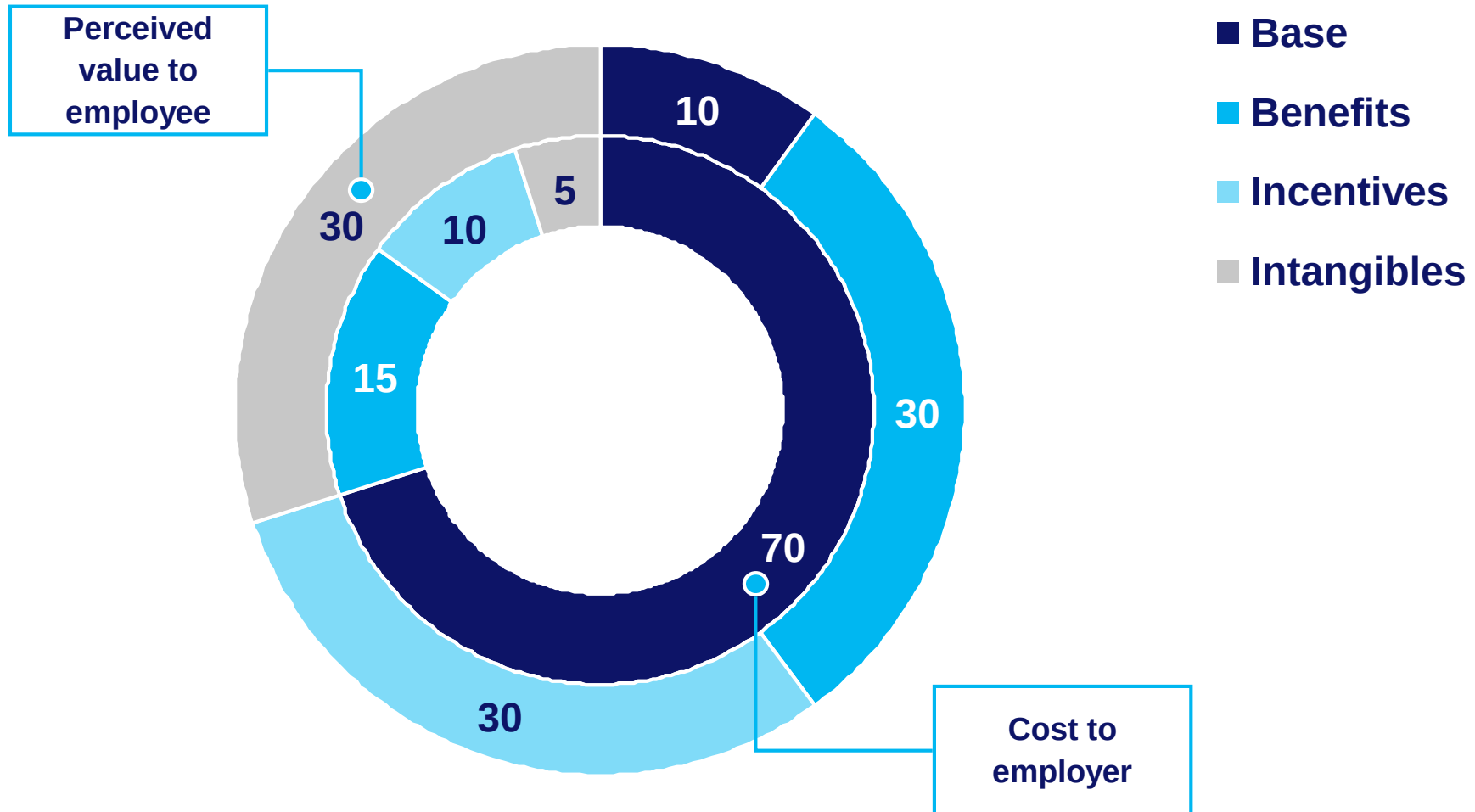
Most used

- Exit interviews
- Cash compensation surveys
- Informal feedback
- Turnover
- Attitude surveys

Opportunities

- Deep diagnostics
- Alignment validation
- Analytics for differentiation

Deep diagnostics: value and insight



One program to start with: Getting variable pay right

- Directly linked to business results
- Manage fixed costs
- Reward differentially
- Drive performance and alignment
- Make culture real
- Support talent management and engagement

**But how many are
really doing this
well?**

Take a hard look

Differentiation

Lack of entitlement

Transparency and trust

Calibration

**Right goals, robust
measures**



One element we know will be essential



Incentives motivate us because:

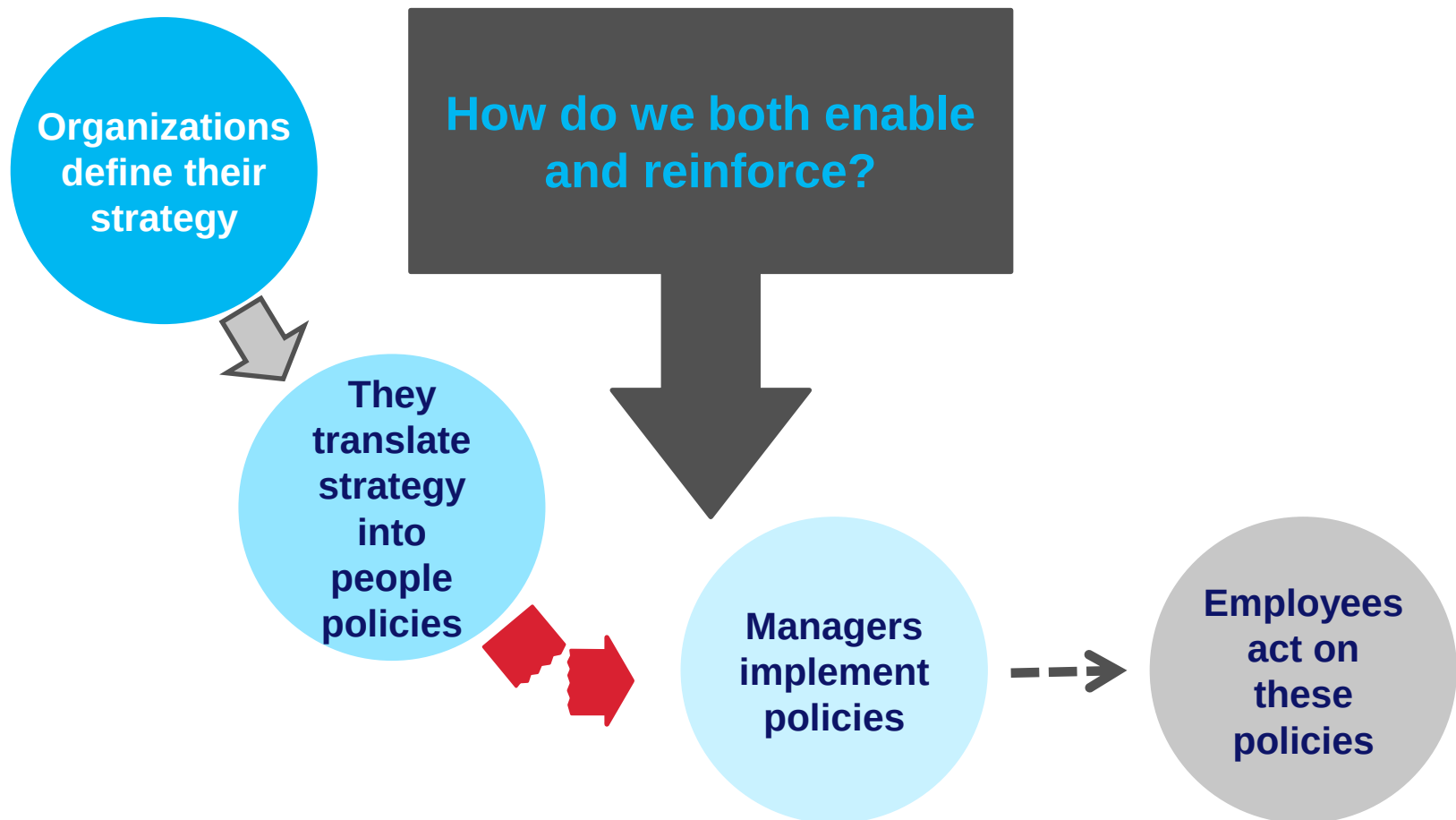
- We can impact them
- They connect us to our impact on the business

Line managers are the key

Revisiting our 9 headlines for effectiveness: Line managers are the vital link

- 1 Start with strategy, and keep coming back to it
- 2 **Don't leave reward solely to HR** – design or implementation
- 3 Use **line managers for decisions and communication** – process, rationale, outcomes
- 4 Make **communication a priority** – simple, clear, focused on goals and key messages
- 5 If performance is important in principle, **make sure it is in practice** too
- 6 Know your value proposition and put it to work
- 7 Make use of **all of total rewards** – and communicate all of it
- 8 **Provide line managers with tools and back up**
- 9 Provide executives with resources for accountability, **alignment and calibration**

People strategy often breaks down at the line



A taste of the future: How line managers are moving front and centre

- Technology as a tool to put reward into the hands of line management
- Improvements in reward communication
- Efficient technology-enabled processes, modelling, decisions

Pace of
business

Distributed
Decisions

Globalization

Technology

Networked
Organizations

Digital
Natives

An example of emerging technology

Activate enables managers to:



Make people decisions in line with strategy in real time



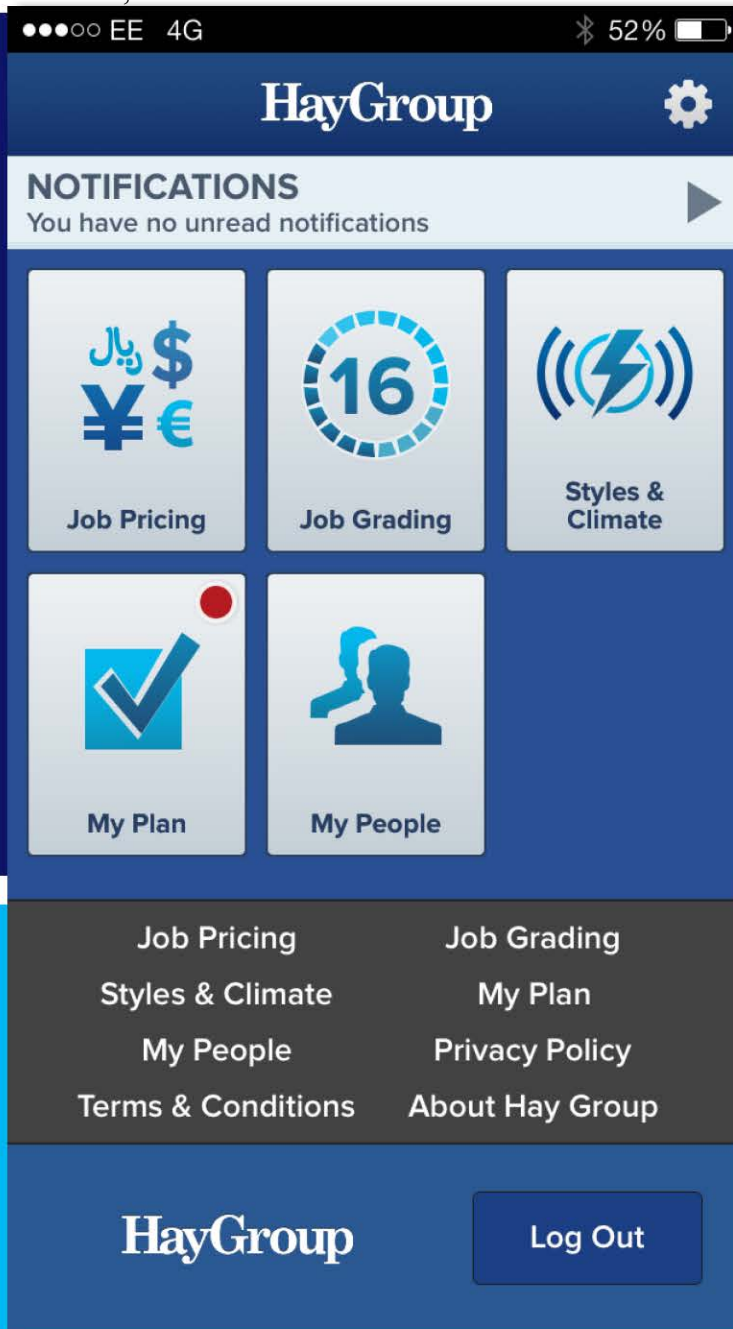
More easily and more quickly undertake people processes. It frees them up from admin and lets them get on with the job of managing



Improve their own capability and that of their teams



HayGroup®



Job Grading

< \$50,000. > \$500,000.

Type of sales Edit

The job holder works on...

simple, transactional, short-term sales in which customers know what they need

complex, consultative, long-term sales in which customers need advice and persuasion

Market dynamics Edit

The job holder handles...

a simple market and/or product lines.

key markets and/or complex product lines.

Compare Share Price

Save This Grading Scenario

Apply This Grade





Thank you for your participation.
We welcome any questions you have.



Today's presenters

Kevin Slater

Rewards Consultant, Hay Group
e: kevin.slater@haygroup.com
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Rachel O'Connor

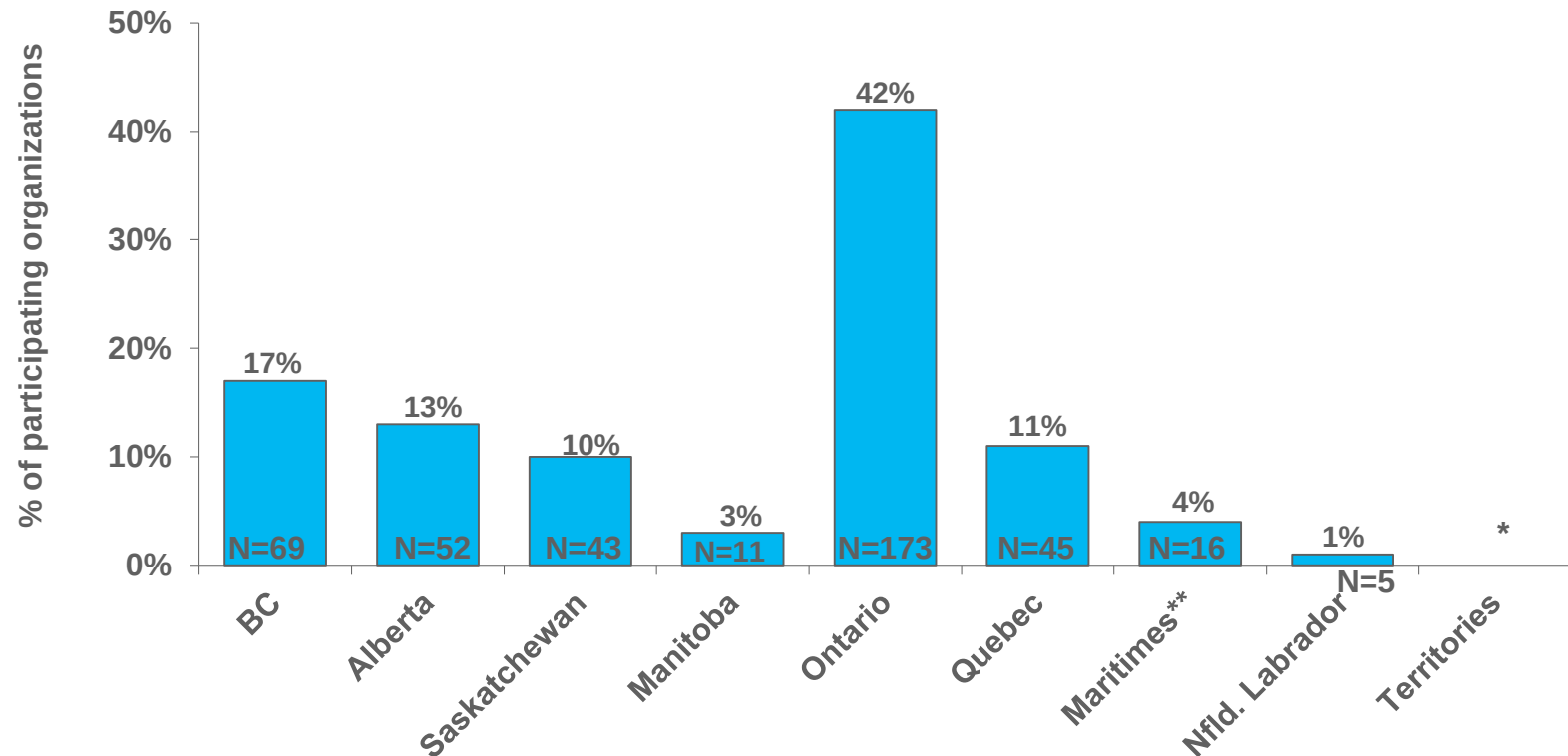
Senior Principal, Hay Group
e: rachel.oconnor@haygroup.com
t: +1.778.945.2915



Appendix 1: Additional forecast survey results

Survey participants – by geography

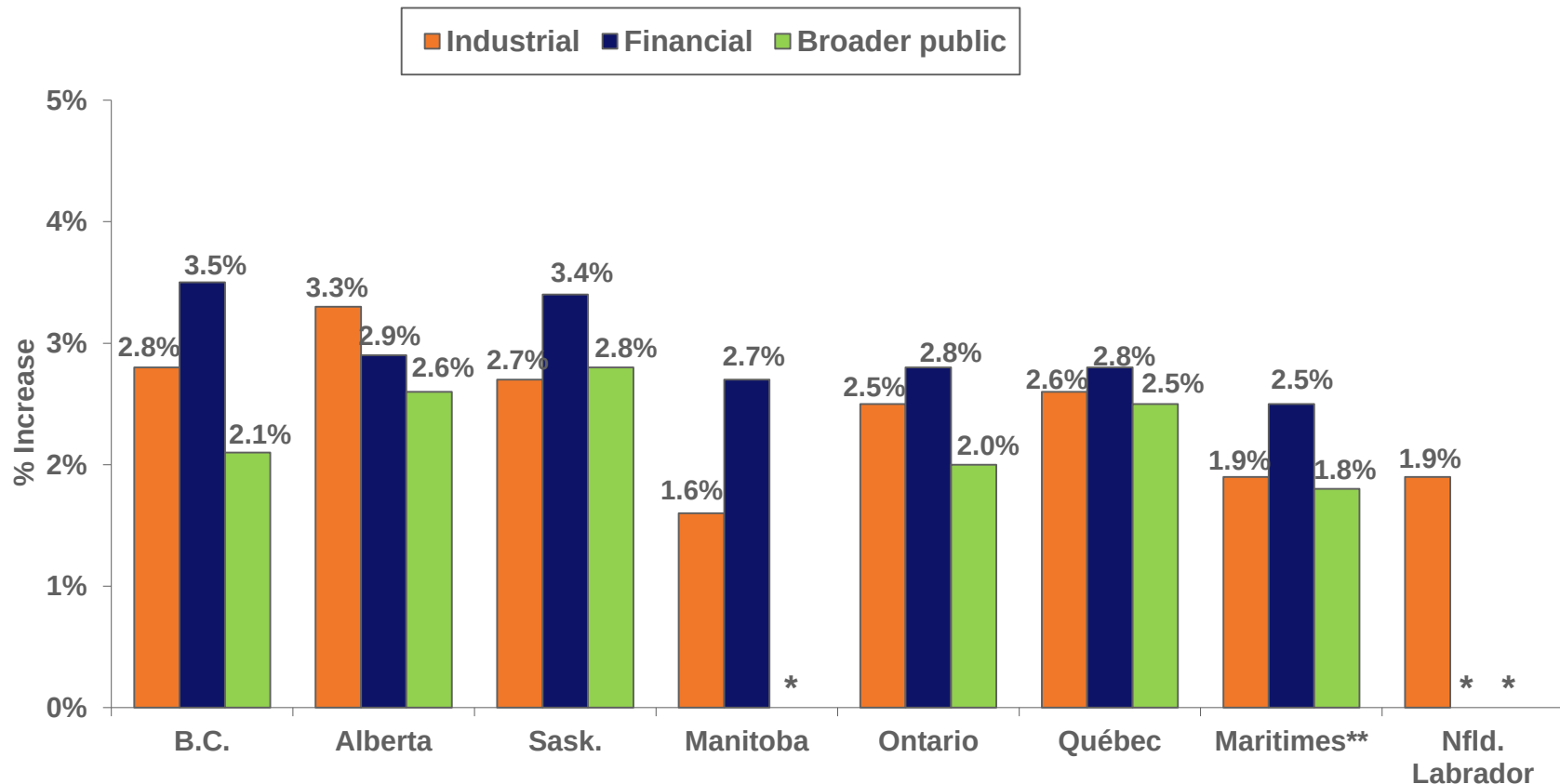
415 organizations were surveyed in June and July 2014



Notes: * Insufficient data

** Maritimes projections are for NS, NB and PEI

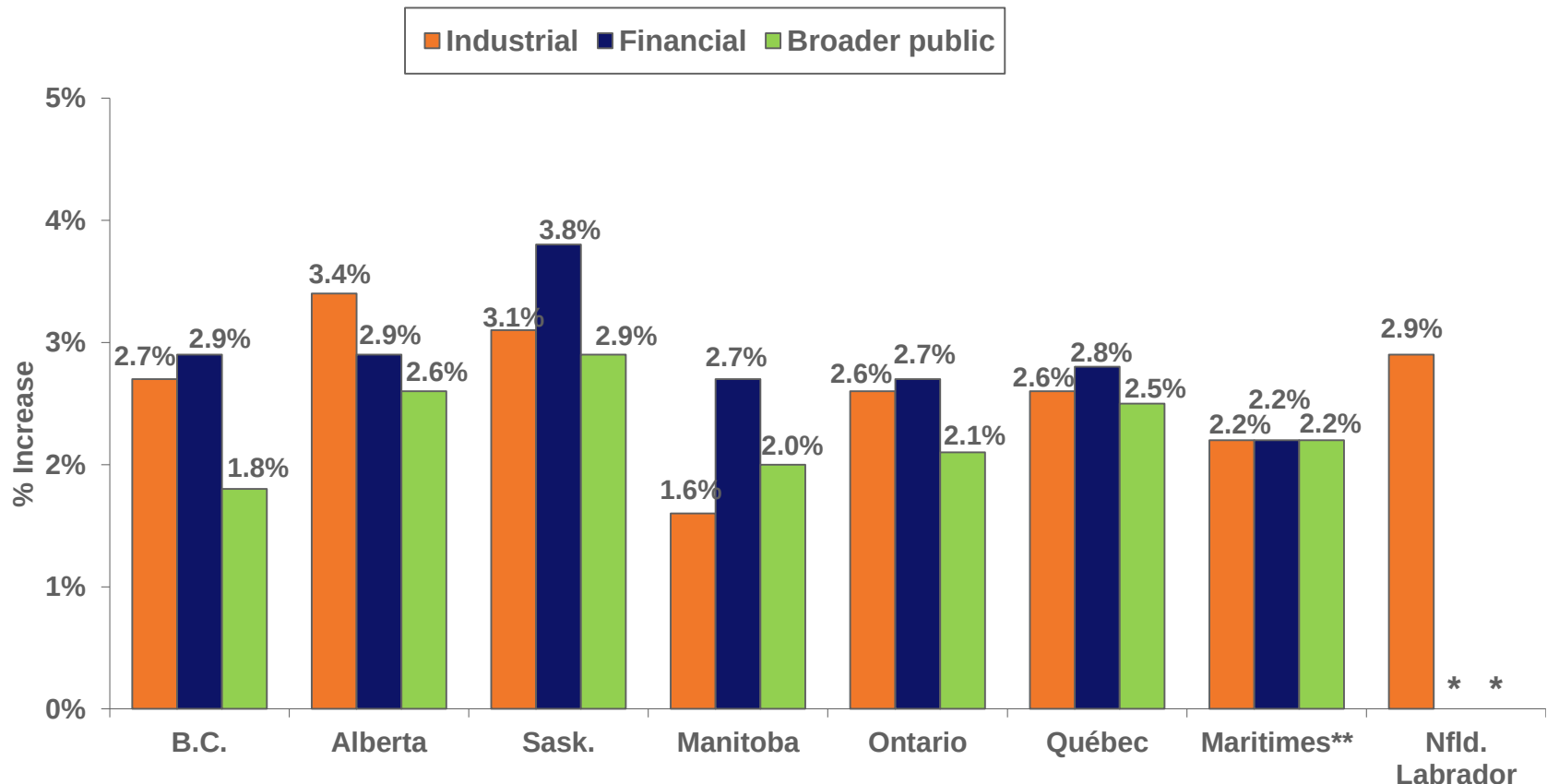
Base salary projections for executive/ senior management



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Separated	yet approved: Combined
Sector: Separated	Job levels: Executive/sr. mgmt.	Revenue: Combined

NOTES: * Insufficient data
 ** Maritimes projections are NS, NB & PEI

Base salary projections for middle management/seasoned professional



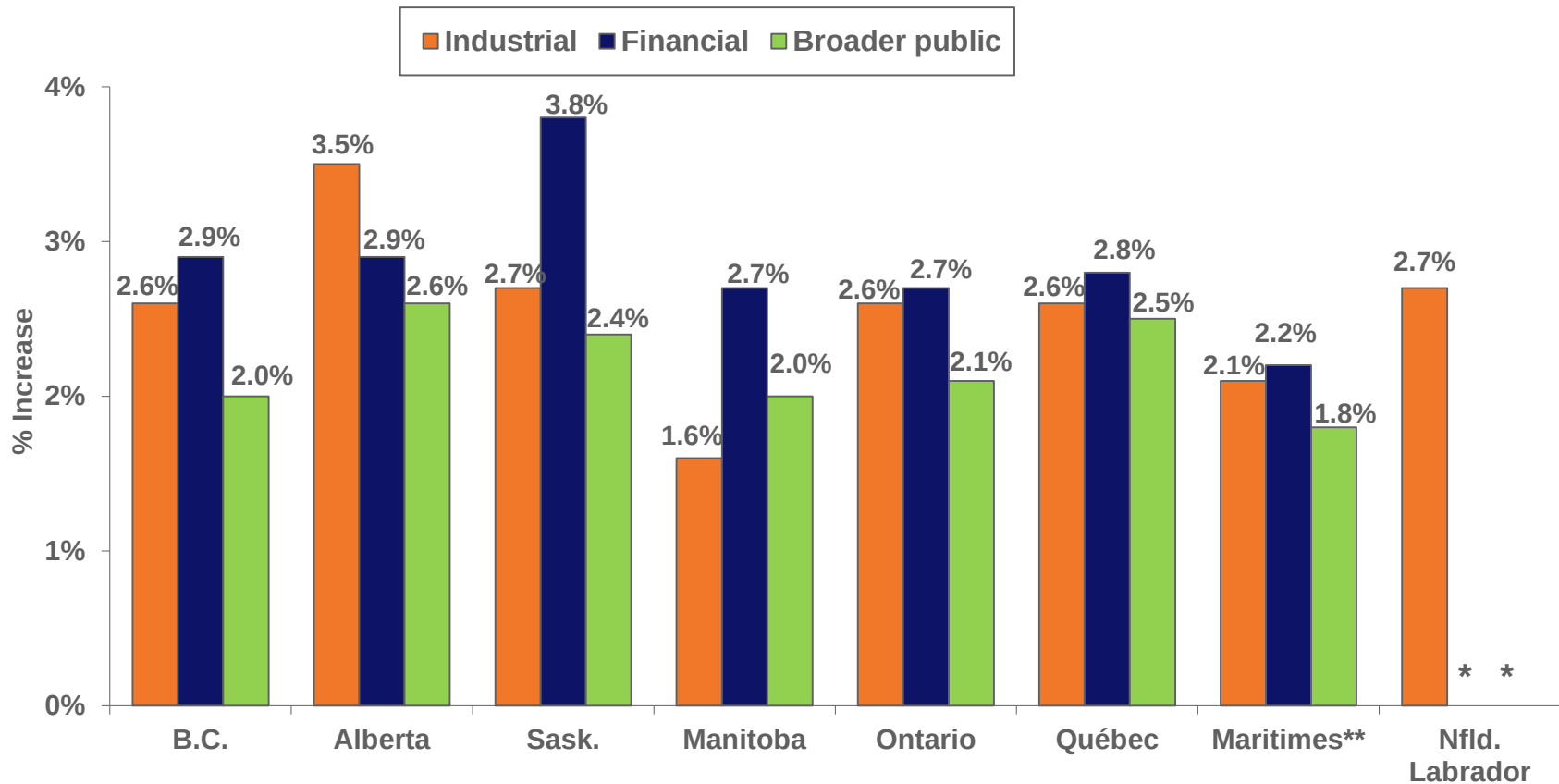
Compensation elements: Salary
Including 0%: Yes
Sector: Separated

Sub-sector: Combined
Geographies: Separated
Job levels: Middle mgmt./season prof.

Approved & not yet approved: Combined
Revenue: Combined

NOTES: * Insufficient data
** Maritimes projections are NS, NB & PEI

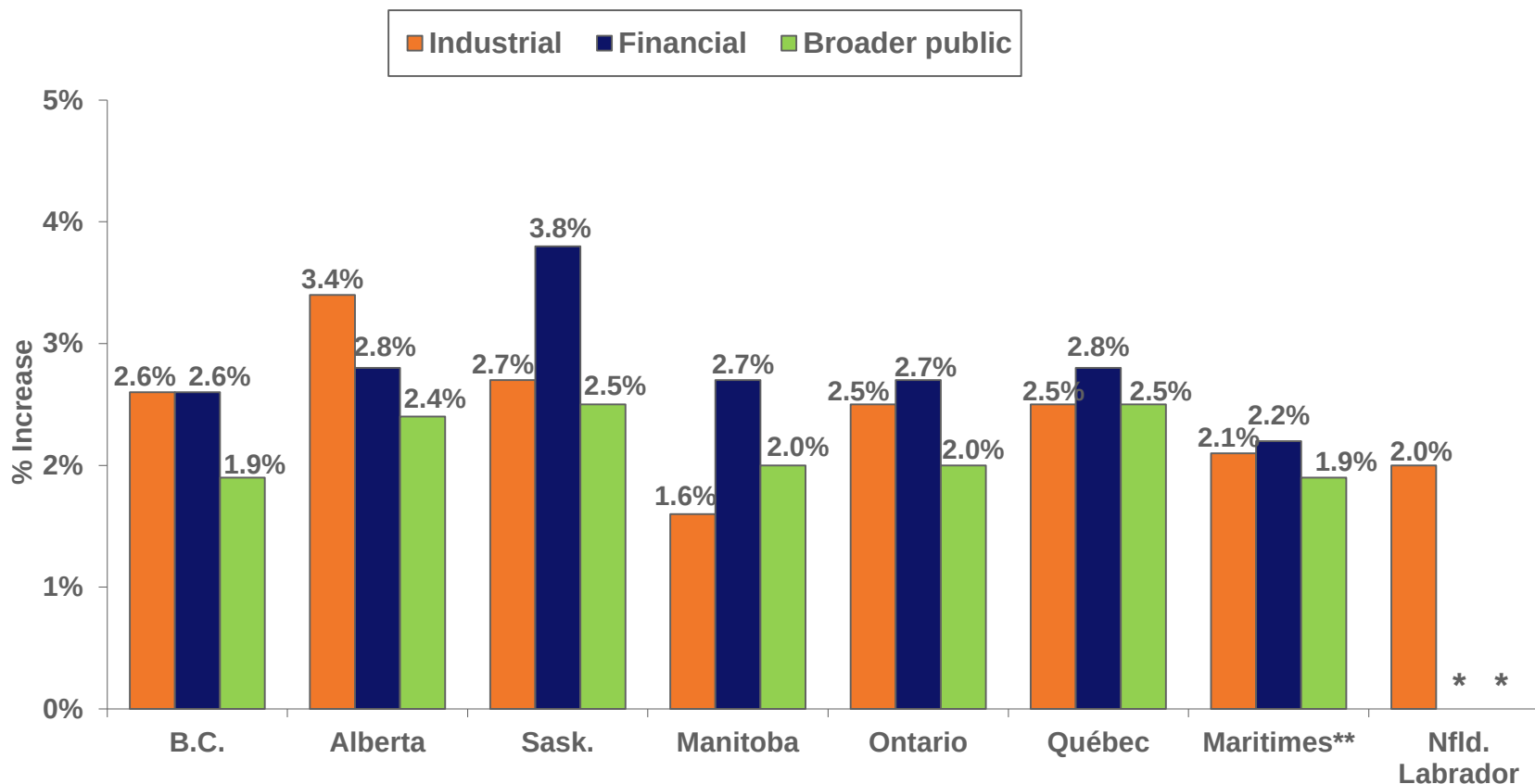
Base salary projections for supervisory/ junior professional



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Separated	yet approved: Combined
Sector: Separated	Job levels: Supervisory/jr. prof.	Revenue: Combined

NOTES: * Insufficient data
 ** Maritimes projections are NS, NB & PEI

Base salary projections for clerical/operations (non-union)



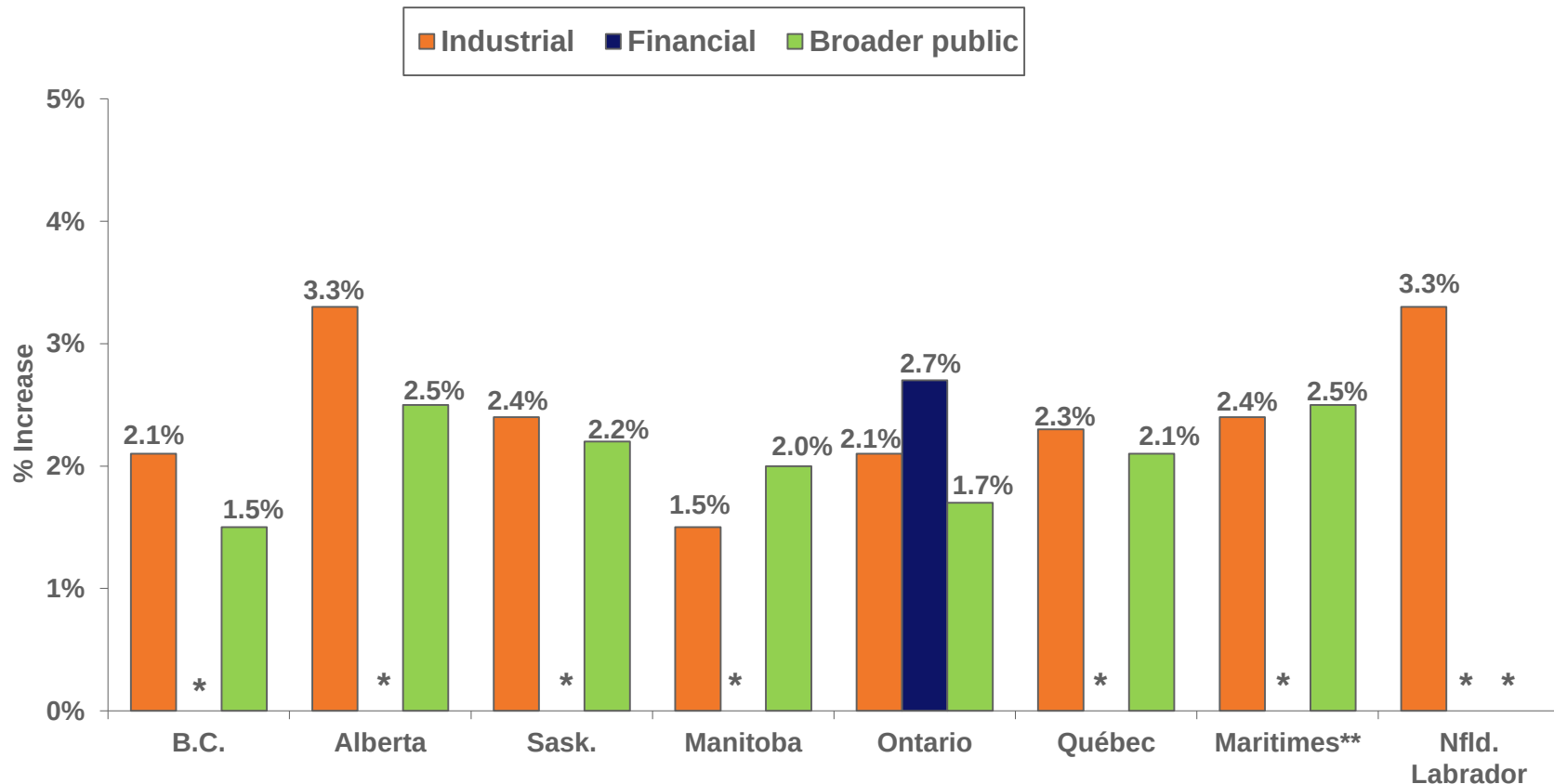
Compensation elements: Salary
Including 0%: Yes
Sector: Separated

Sub-sector: Combined
Geographies: Separated
Job levels: Clerical/Ops (non-union)

Approved & not yet approved: Combined
Revenue: Combined

NOTES: * Insufficient data
** Maritimes projections are NS, NB & PEI

Base salary projections for clerical/operations (union)



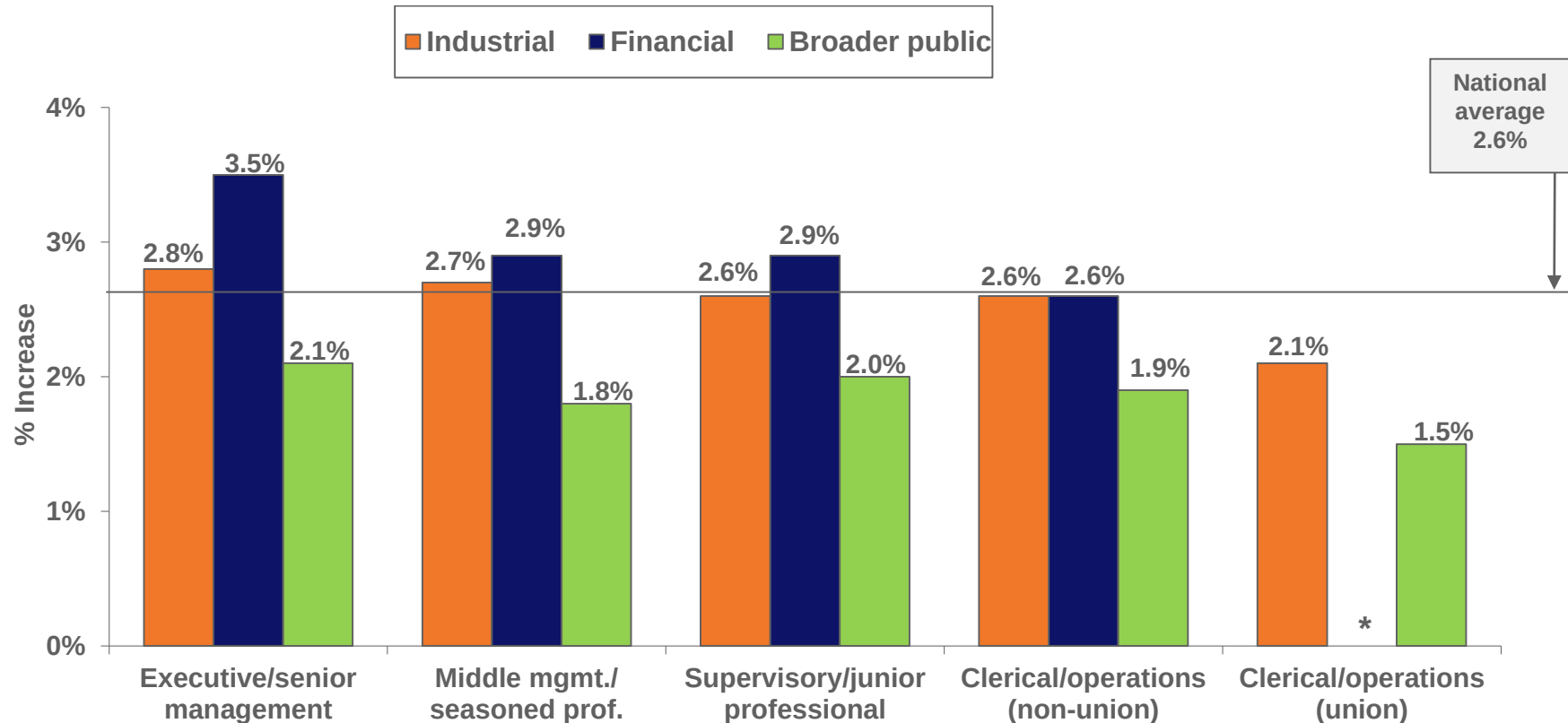
Compensation elements: Salary
Including 0%: Yes
Sector: Separated

Sub-sector: Combined
Geographies: Separated
Job levels: Clerical/Ops (Union)

Approved & not yet approved: Combined
Revenue: Combined

NOTES: * Insufficient data
 ** Maritimes projections are NS, NB & PEI

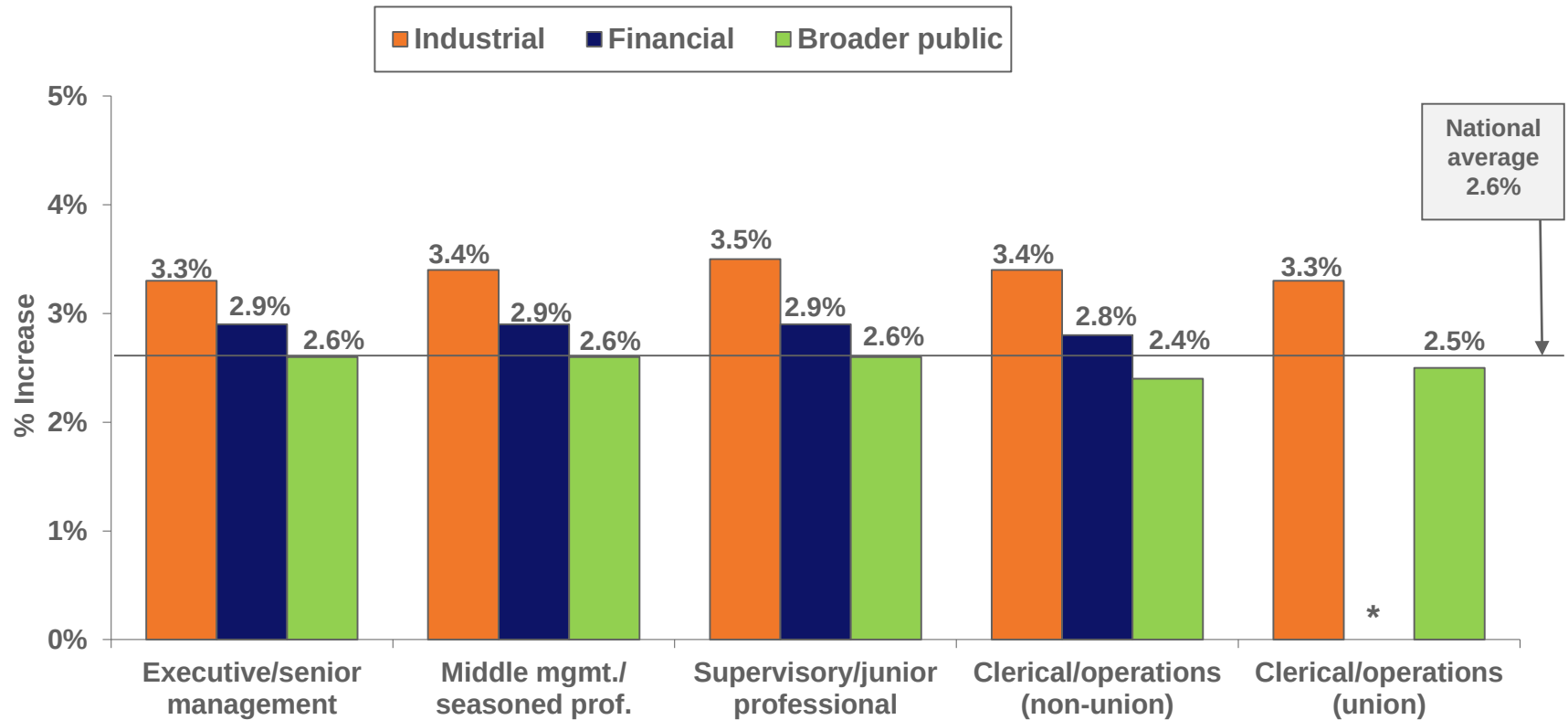
Base salary projections for British Columbia



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: British Columbia	yet approved: Combined
Sector: Separated	Job levels: Separated	Revenue: Combined

NOTE: * Insufficient data

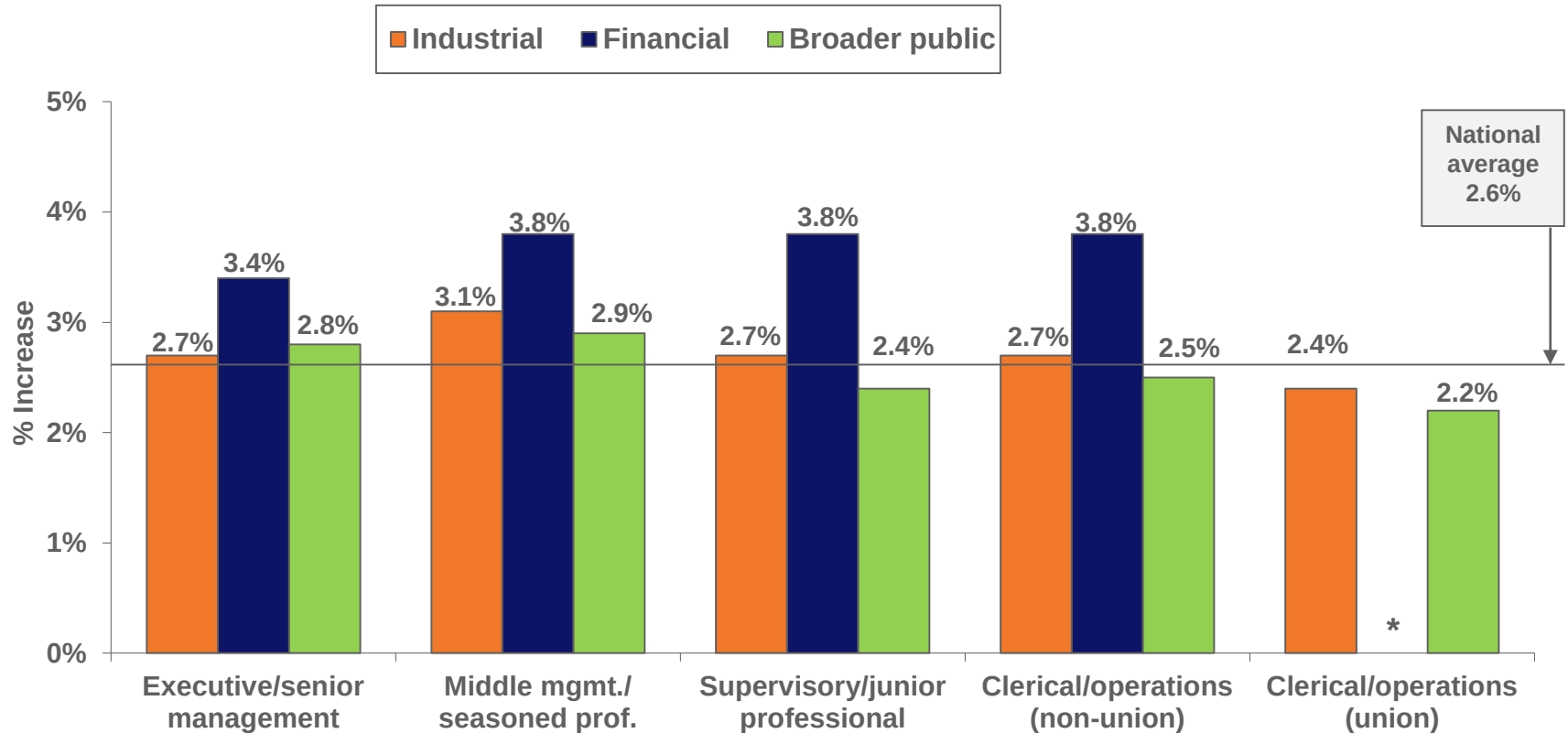
Base salary projections for Alberta



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Alberta	yet approved: Combined
Sector: Separated	Job levels: Separated	Revenue: Combined

NOTE: * Insufficient data

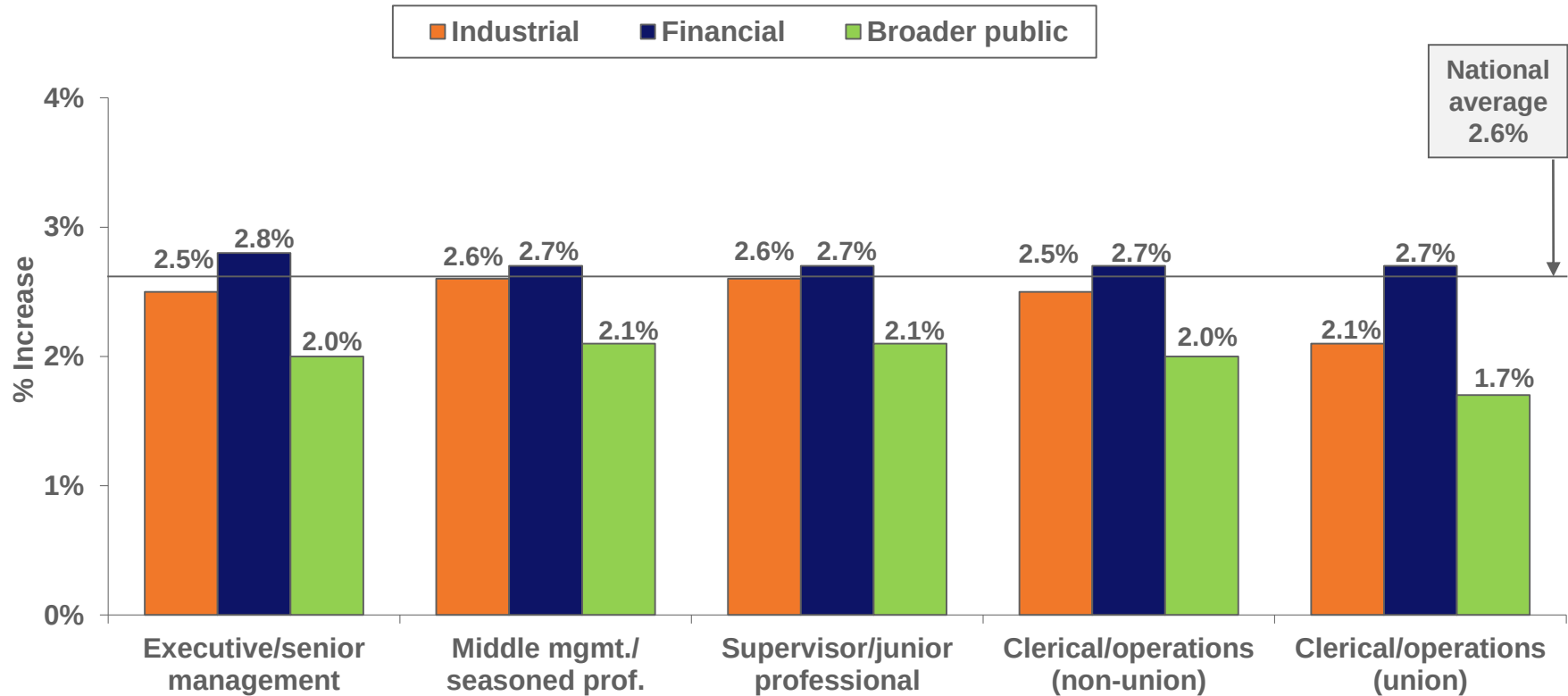
Base salary projections for Saskatchewan



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Saskatchewan	yet approved: Combined
Sector: Separated	Job levels: Separated	Revenue: Combined

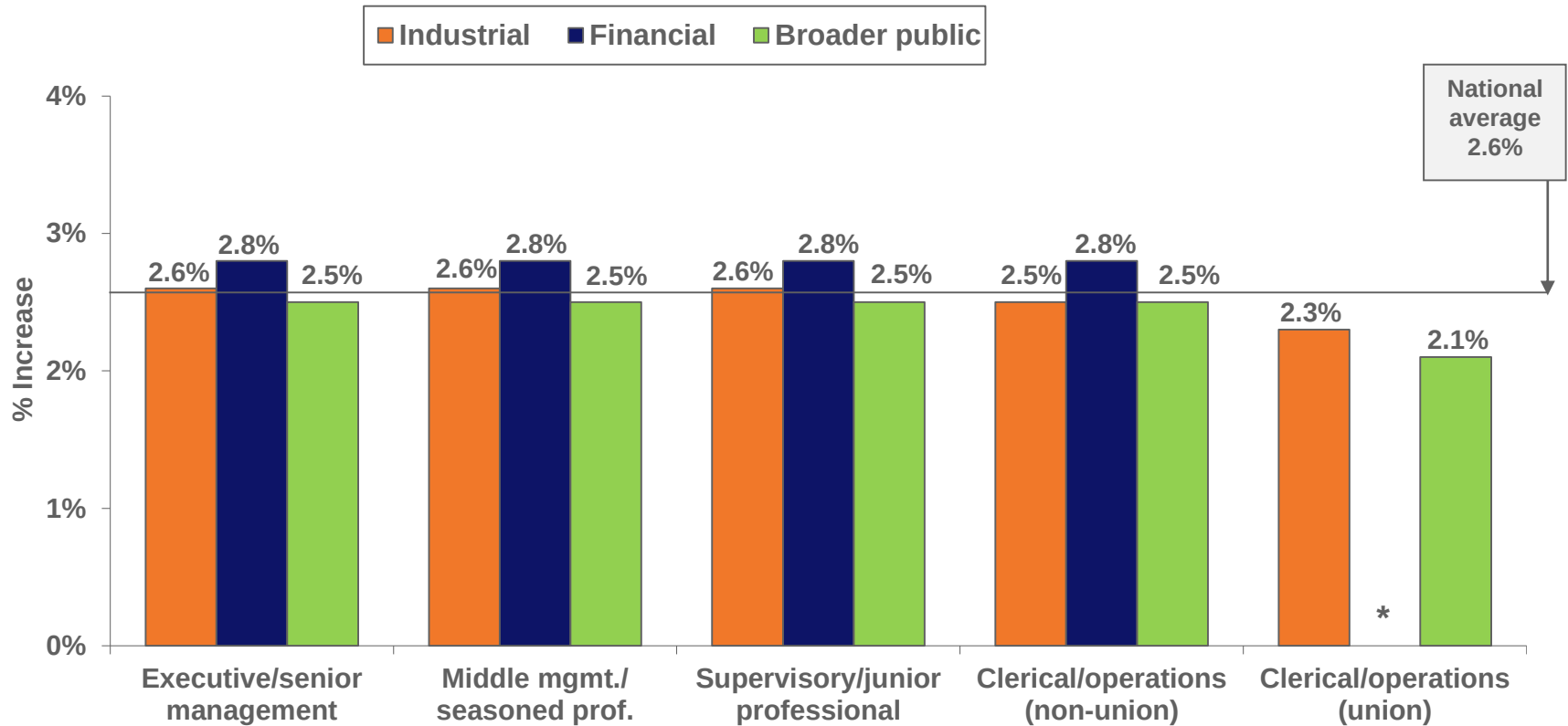
NOTE: * Insufficient data

Base salary projections for Ontario



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes	Geographies: Ontario	yet approved: Combined
Sector: Separated	Job levels: Separated	Revenue: Combined

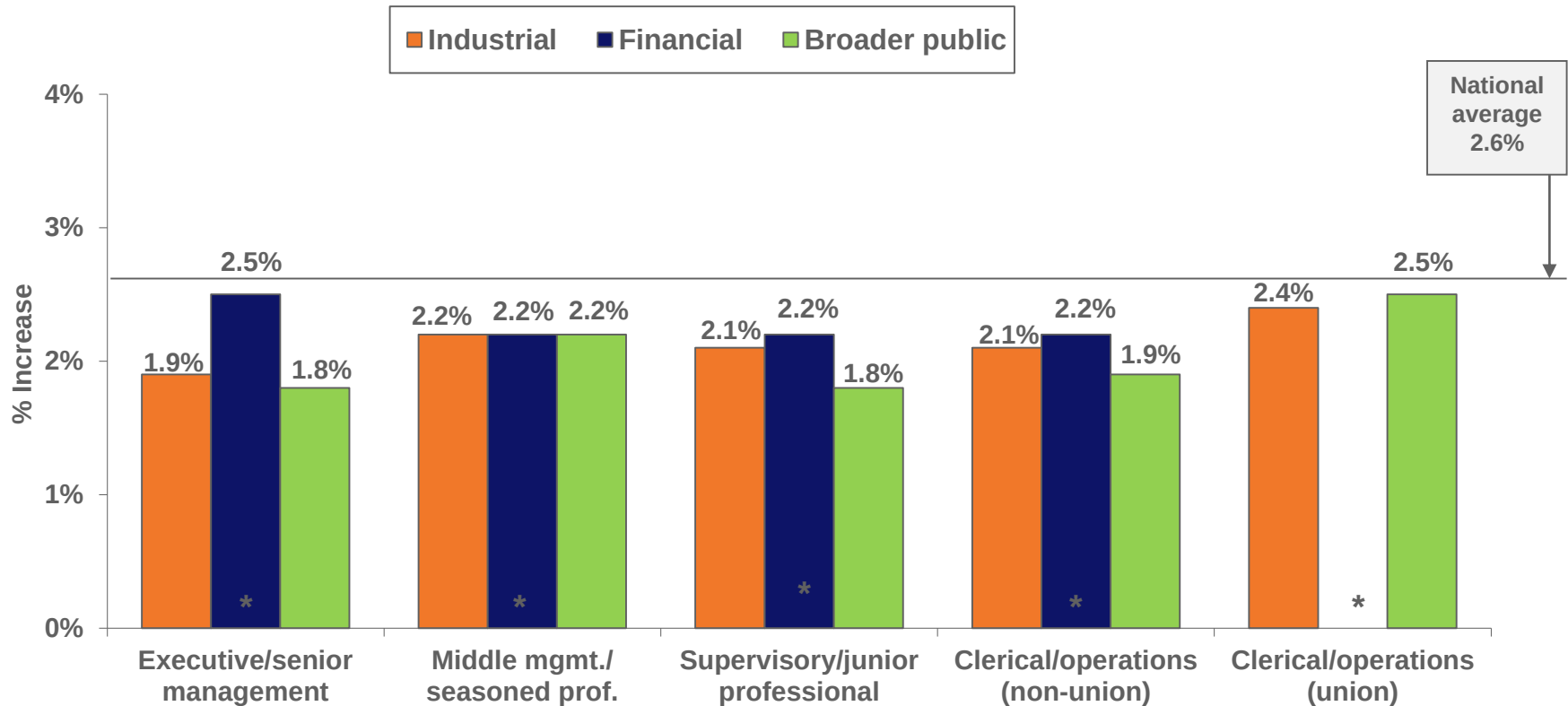
Base salary projections for Québec



Compensation elements: Salary	Sub-sector: Combined	Approved & not yet approved: Combined
Including 0%: Yes	Geographies: Québec	Revenue: Combined
Sector: Separated	Job levels: Separated	

NOTE: * Insufficient data

Base salary projections for Maritimes**



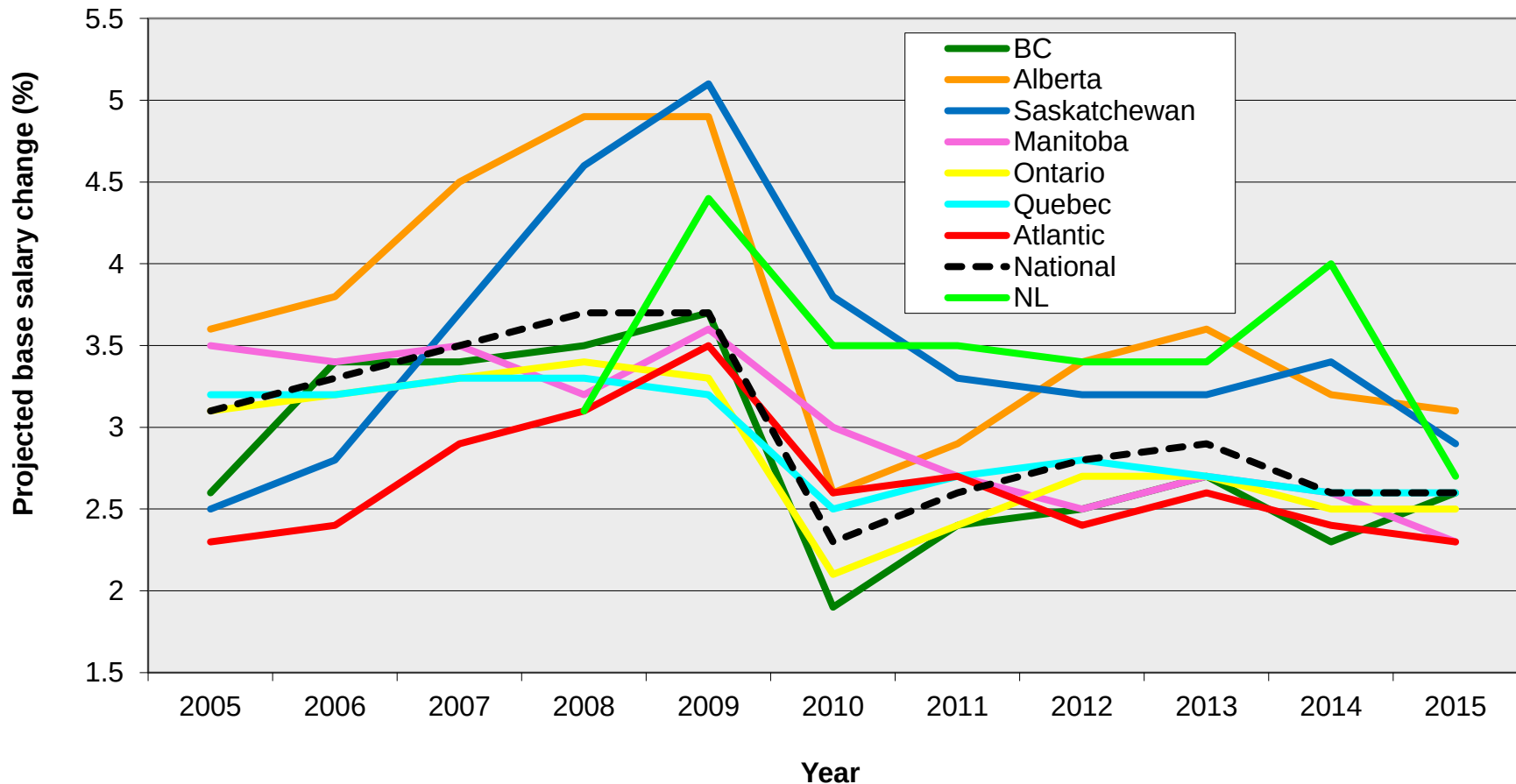
Compensation elements: Salary
Including 0%: Yes
Sector: Separated

Sub-sector: Combined
Geographies: Atlantic Canada
Job levels: Separated

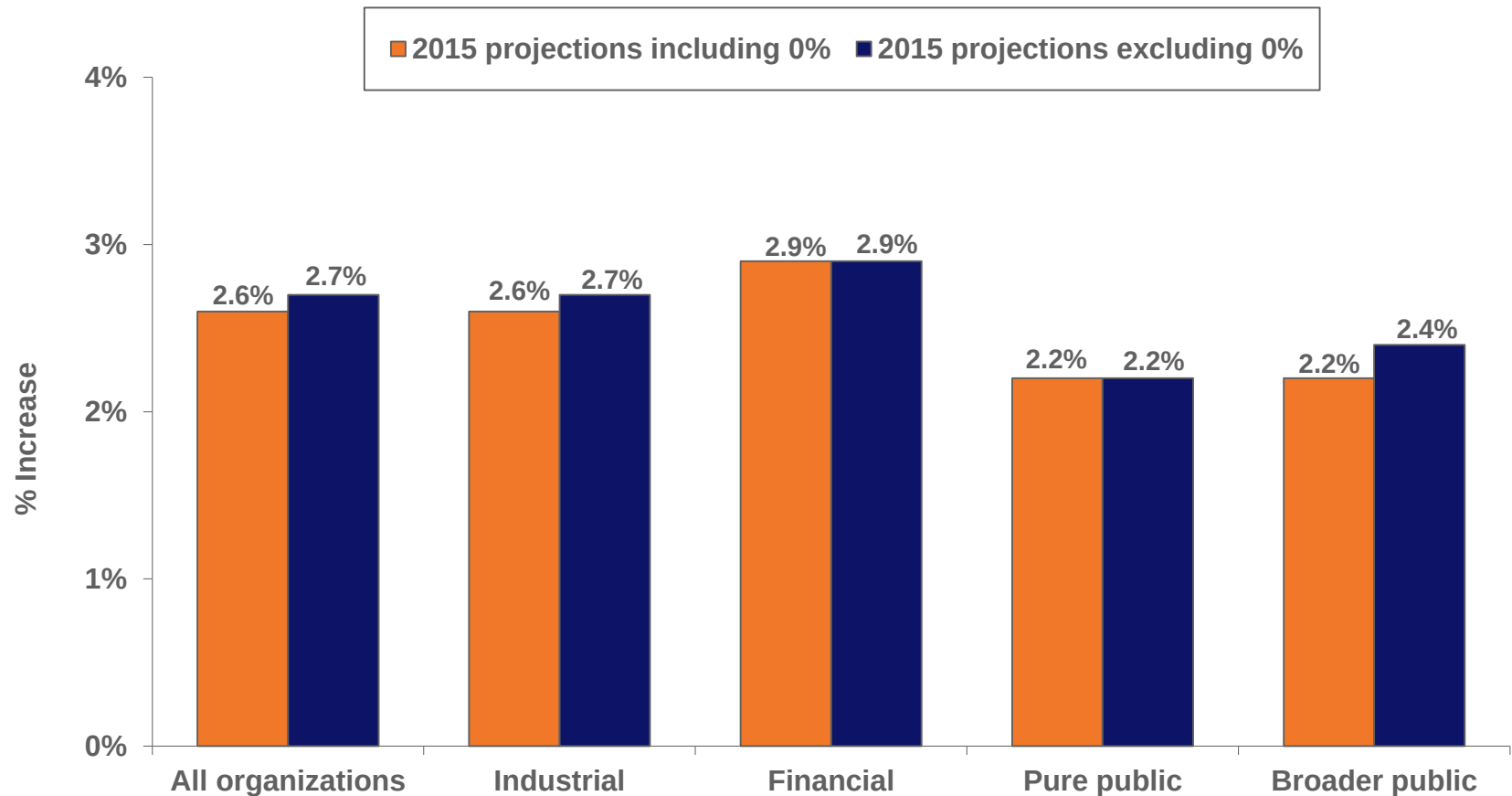
Approved & not yet approved: Combined
Revenue: Combined

NOTES: * Insufficient data
** Maritimes projections are NS, NB & PEI

Base salary projections by geography for past 10 years

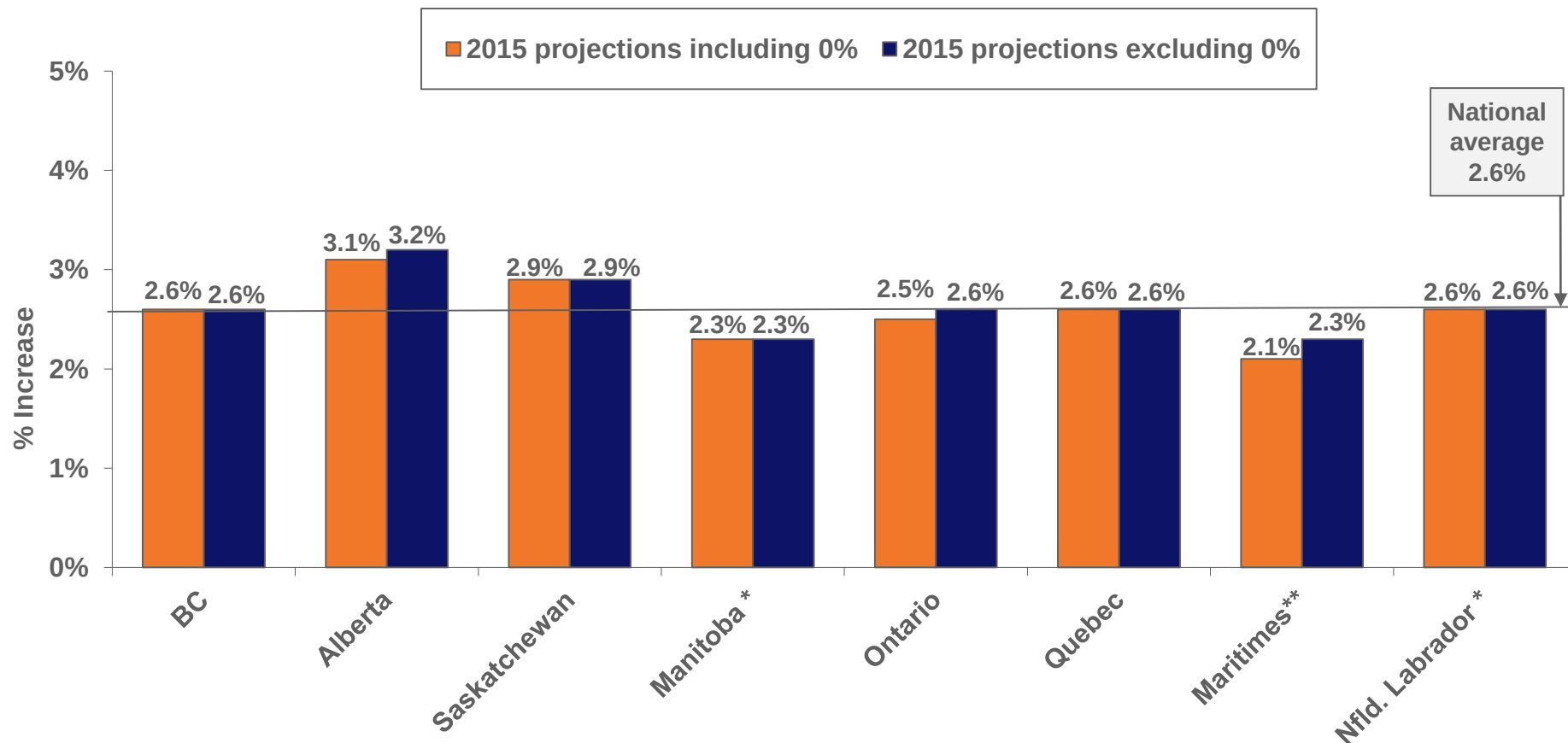


Base salary projections: including 0% and excluding 0%



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes / no	Geographies: Combined	yet approved: Combined
Sector: Separated	Job levels: Combined	Revenue: Combined

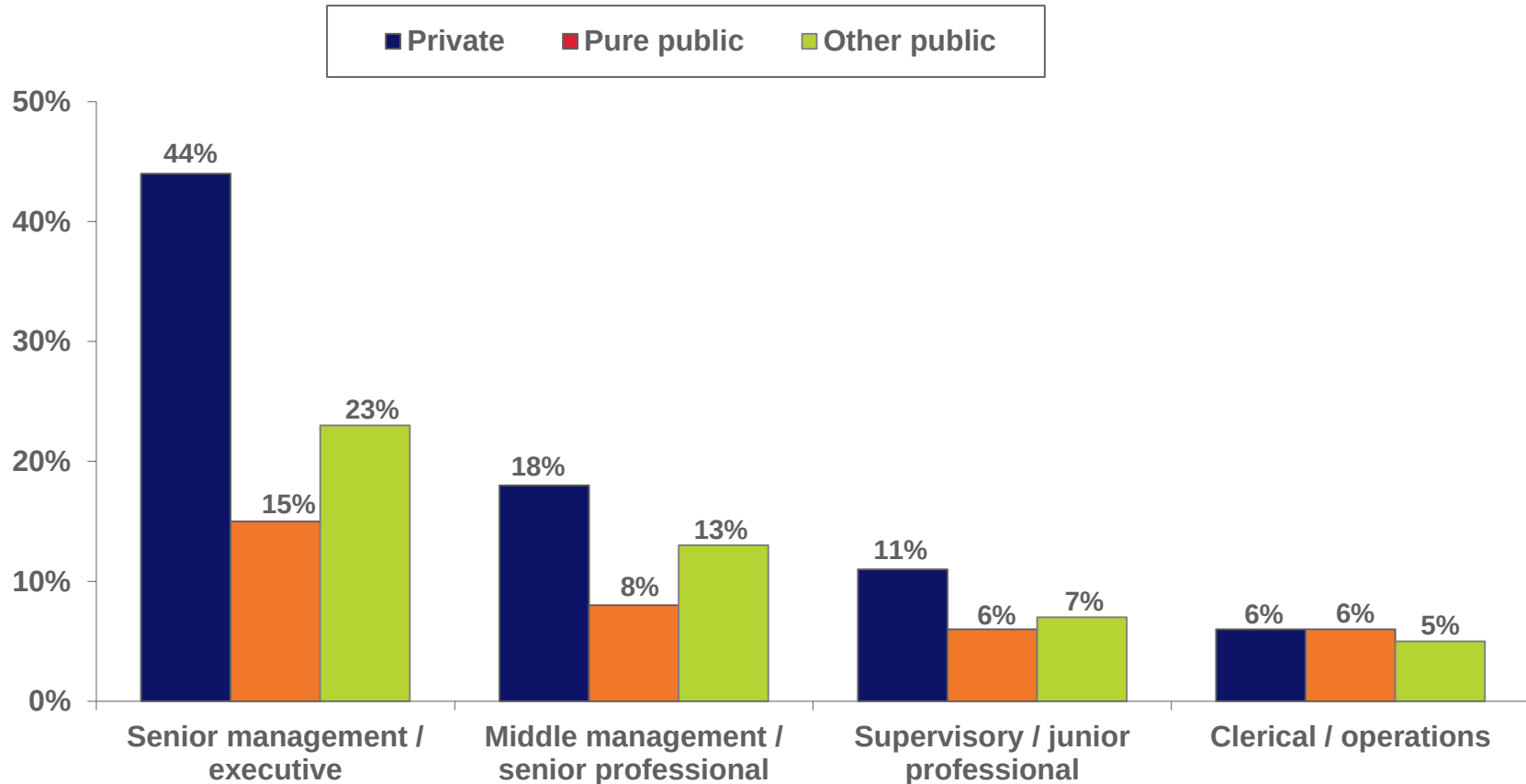
Base salary projections by geography – including and excluding 0%



Compensation elements: Salary	Sub-sector: Combined	Approved & not
Including 0%: Yes/no	Geographies: Separated	yet approved: Combined
Sector: Combined	Job levels: Combined	Revenue: Combined

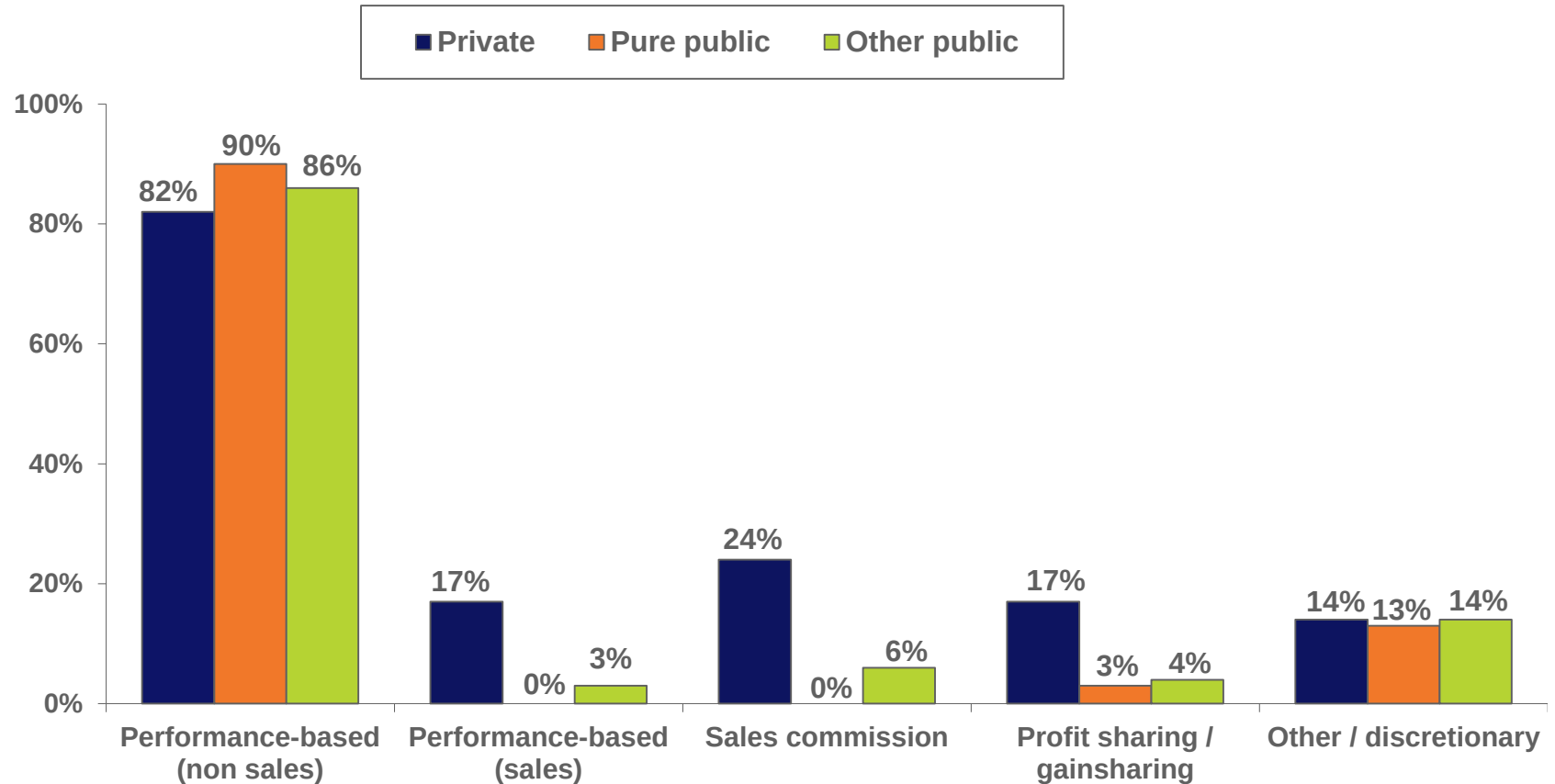
Notes: * less than 10 organizations
 ** Maritimes projections are for NS, NB and PEI

Variable pay design (as a % of base salary) – public vs. private



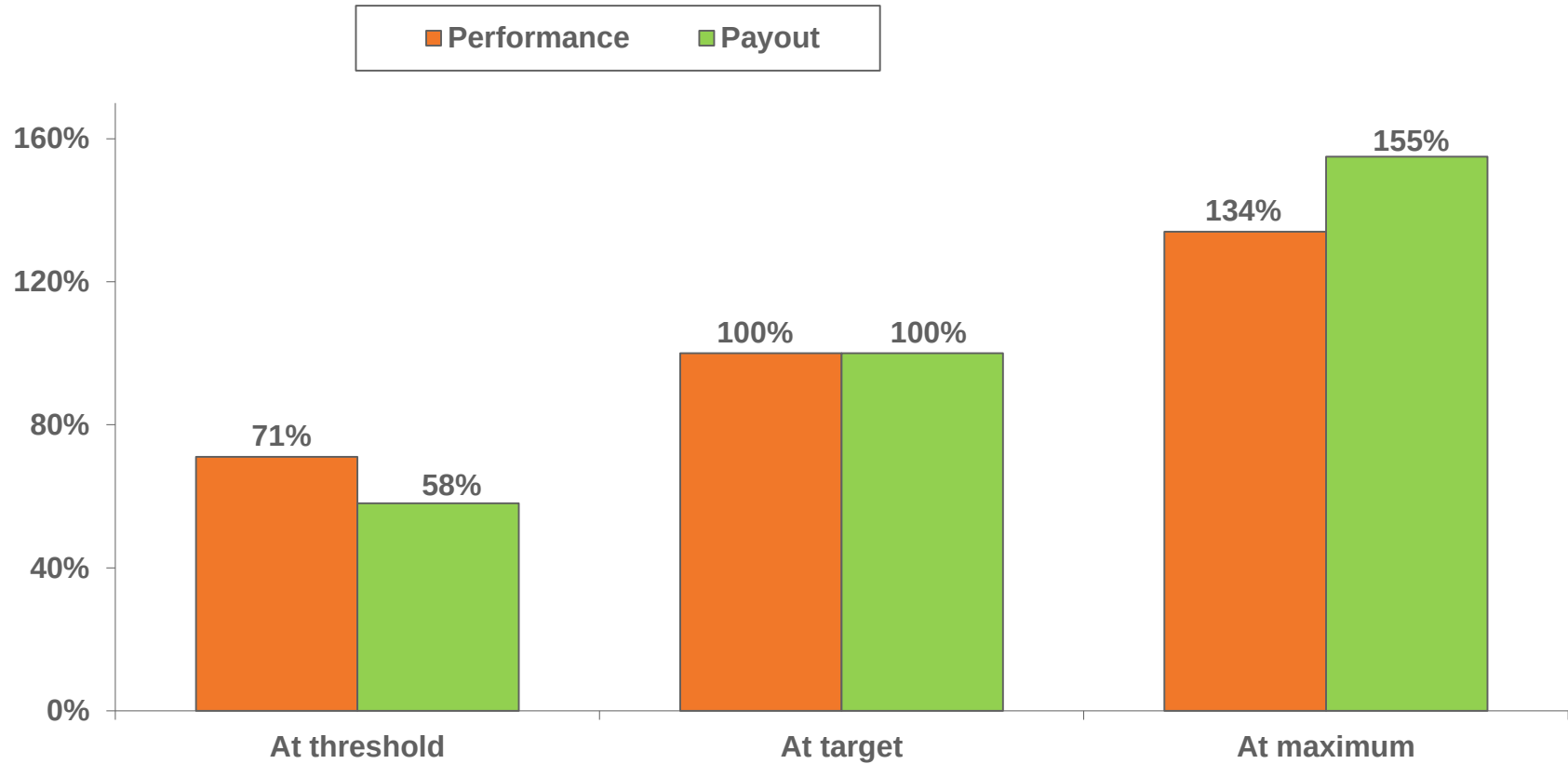
Source: Hay Group PayNet database

Variable pay by plan type for STI eligible organizations



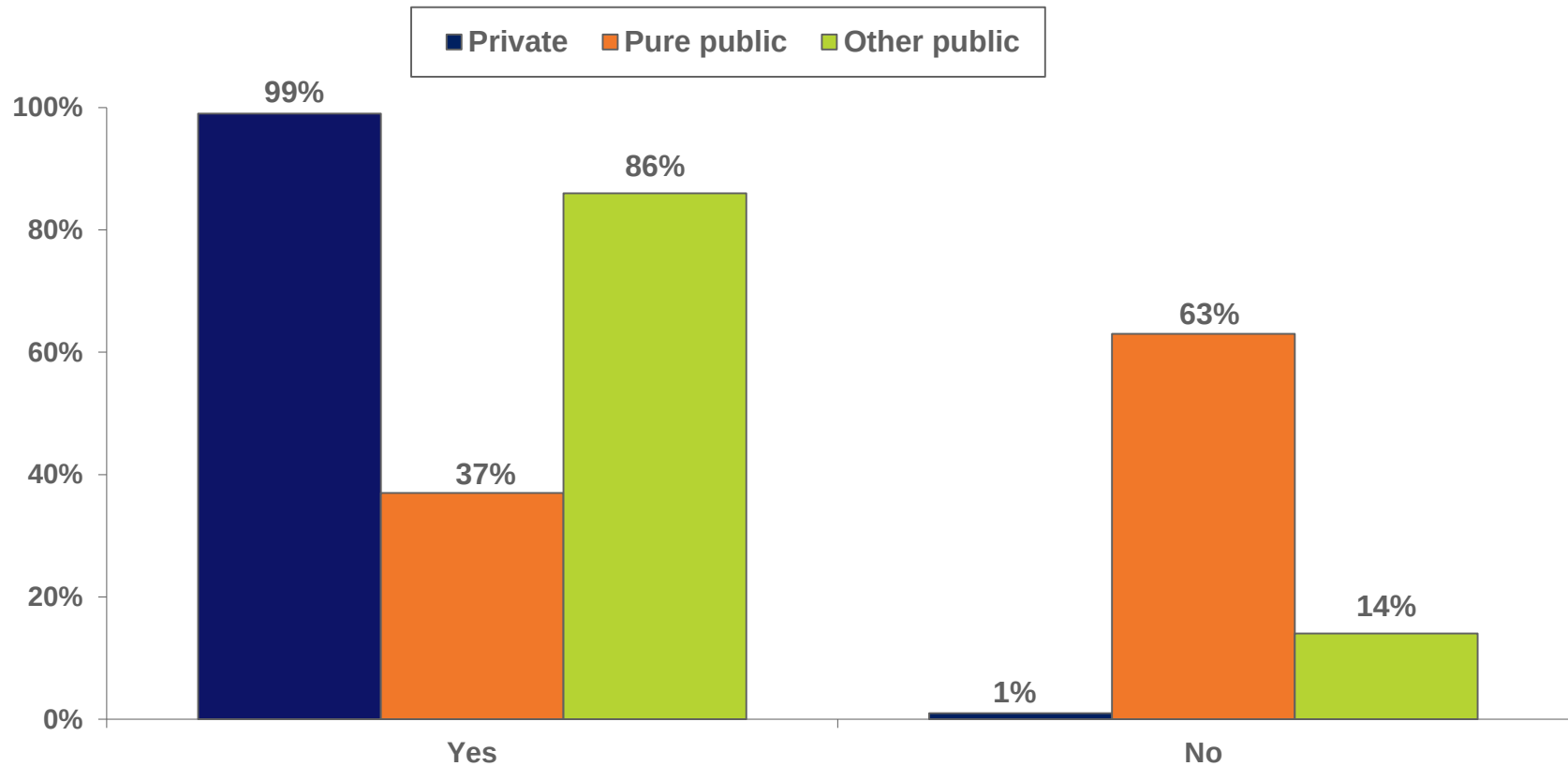
Source: Hay Group PayNet database

Variable pay performance to payout ratios



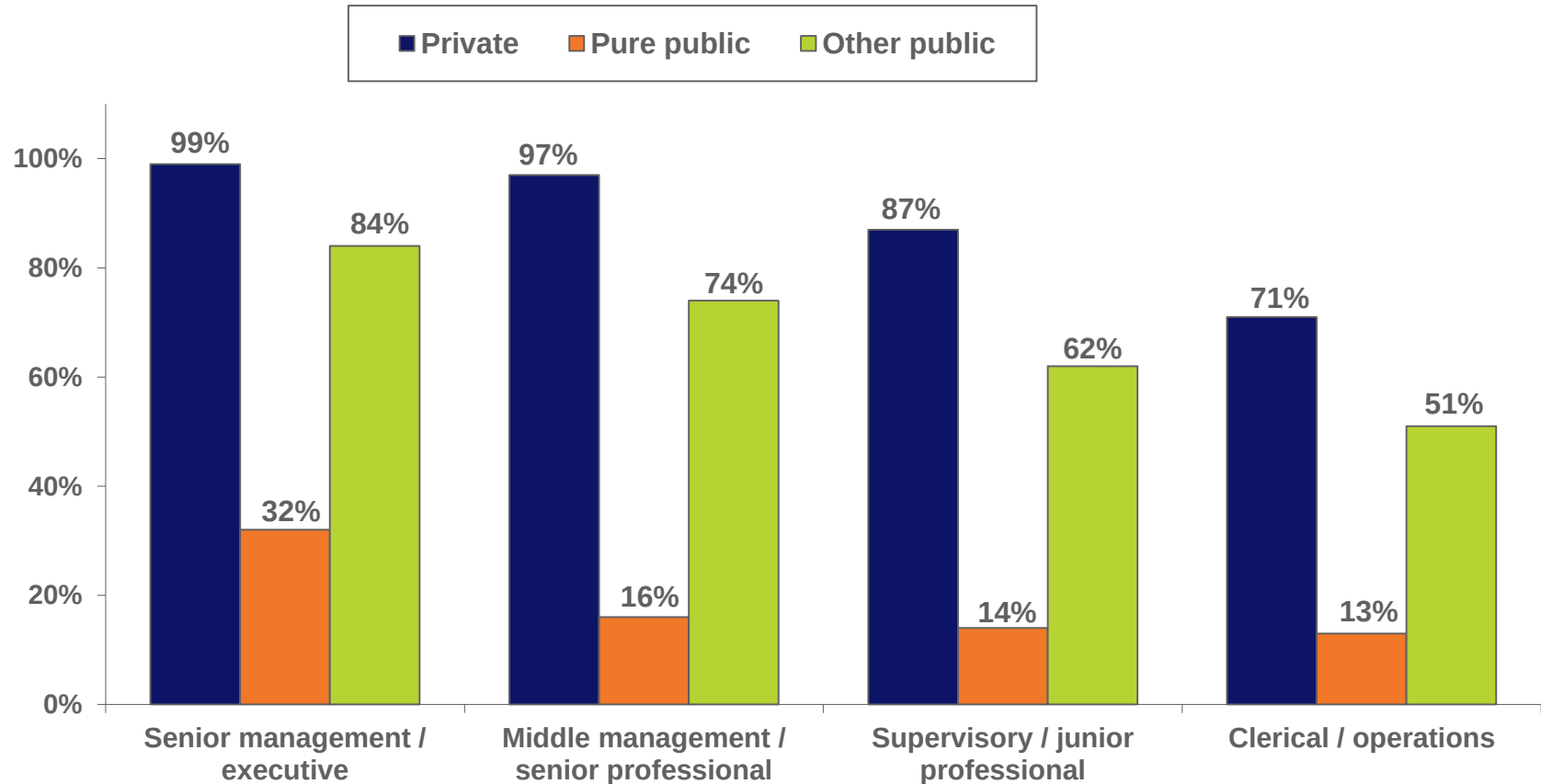
Source: Hay Group PayNet database

Not just for the private sector any more



Source: Hay Group PayNet database

Participation at every level – but mostly at the top

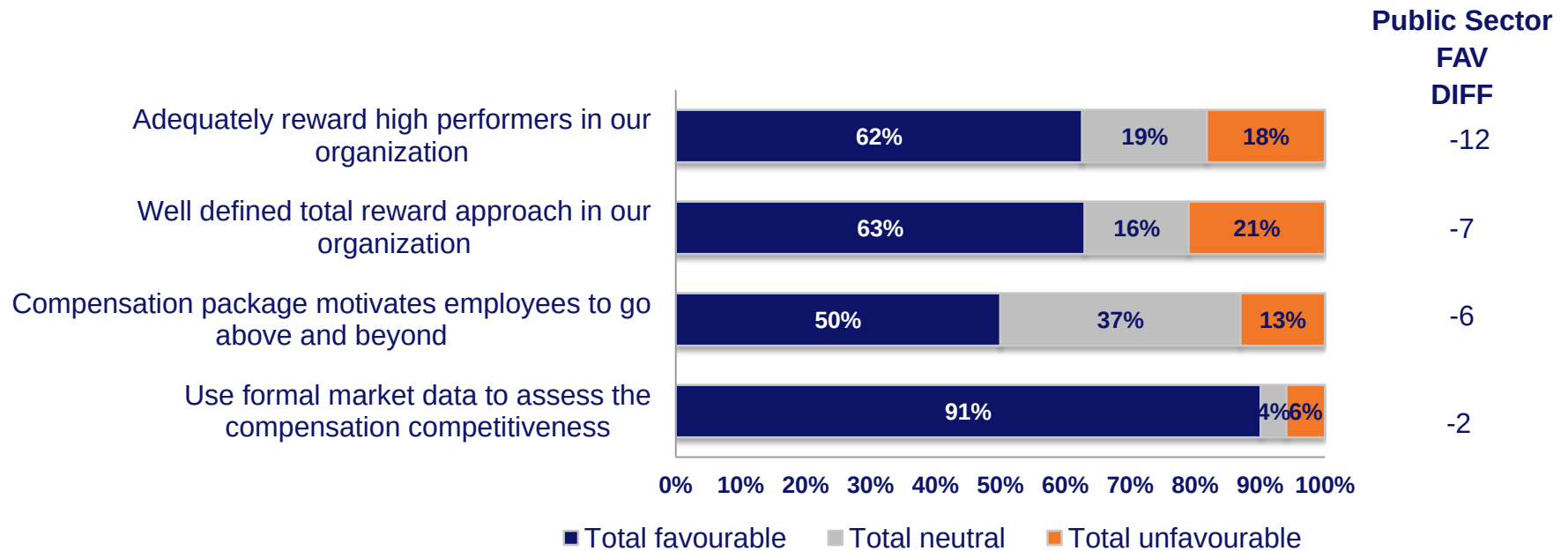


Source: Hay Group PayNet database

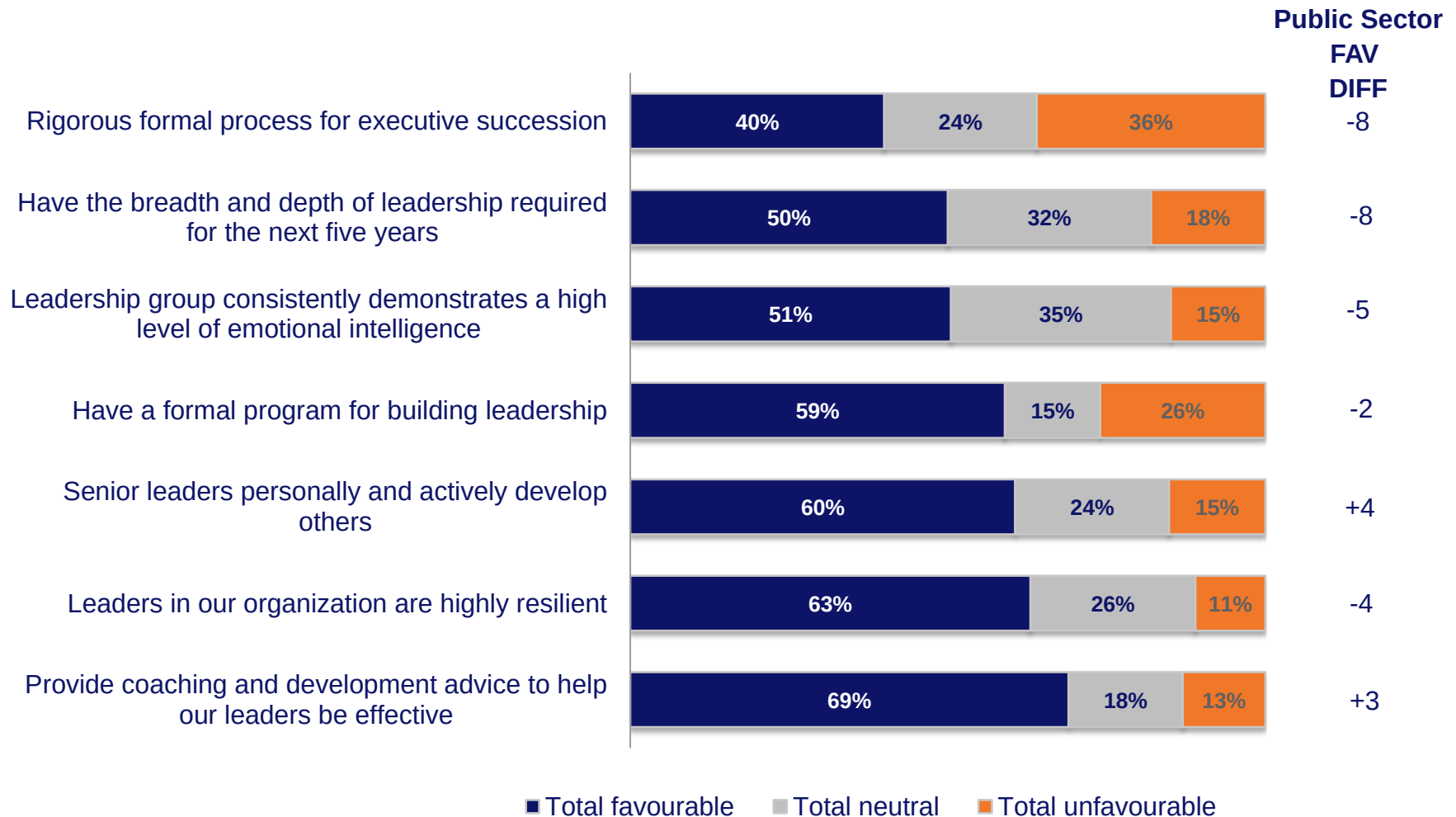


Appendix 2: HR Practices and Priorities

Reward priorities



Leadership priorities



Engagement priorities

People issues

Managers are empowered and have the tools to effectively resolve people issues



Public Sector
FAV
DIFF

-9

Engagement

■ Total favourable ■ Total neutral ■ Total unfavourable

Develop strategies to engage and support the millennial generation



0

Effectively use technology and tools to build communities of practice and sharing forums



-2

Develop action plans and response strategies to improve engagement



+5

Train/support leaders in addressing engagement levels in their team



+5

Understand current levels of employee engagement



+2

■ Total favourable ■ Total neutral ■ Total unfavourable

Date Filed: March 27, 2015

NSPI IR-42 Attachment 3 Page 1 of 2

Statistics Canada

Home Summary tables

Related tables:

[Consumer price indexes](#)Consumer Price Index, by province
(Nova Scotia)

2014	2013	2012	2011	2010	
100=2002					
					.N.S
128.8	126.6	125.1	122.7	118.2	All-items
141.5	139.6	137.8	134.1	128.2	Food
141.1	138.1	135.2	131.2	125.5	Shelter
117.2	115.0	113.1	111.9	110.7	Household operations, furnishings and equipment
98.2	95.9	93.7	92.9	89.8	Clothing and footwear
125.9	124.5	123.9	121.7	114.1	Transportation
116.4	115.5	116.7	115.3	112.9	Health and personal care
109.6	107.7	108.3	108.1	107.4	Recreation, education and reading
176.2	167.9	163.1	160.4	156.0	Alcoholic beverages and tobacco products
Special aggregates					
126.2	123.9	122.5	120.4	116.2	All-items excluding food
122.9	121.0	119.5	118.0	115.4	All-items excluding energy
change from previous year %					
1.7	1.2	2.0	3.8	2.2	All-items
1.4	1.3	2.8	4.6	1.9	Food
2.2	2.1	3.0	4.5	1.2	Shelter
1.9	1.7	1.1	1.1	2.1	Household operations, furnishings and equipment
2.4	2.3	0.9	3.5	1.1-	Clothing and footwear
1.1	0.5	1.8	6.7	4.6	Transportation
0.8	1.0-	1.2	2.1	1.6	Health and personal care

3/24/2015

1.8	0.6-	0.2	0.7	1.5	Recreation, education and reading
4.9	2.9	1.7	2.8	5.1	Alcoholic beverages and tobacco products
Special aggregates					
1.9	1.1	1.7	3.6	2.3	All-items excluding food
1.6	1.3	1.3	2.3	1.8	All-items excluding energy

.Note: Annual average indexes are obtained by averaging the indexes for the 12 months of the calendar year

.Source: Statistics Canada, CANSIM, table [326-0021](#) and Catalogue nos. [62-001-X](#) and [62-010-X](#)

.Last modified: 2015-01-23

To learn more about the Consumer Price Index, see [Your Guide to the Consumer Price Index](#)

[Find information](#) related to this table (CANSIM table(s); Definitions, data sources and methods; *The Daily*; publications; (and related Summary tables

:Date modified 2015-01-23

**STATEMENT OF PRACTICE AND PROCEDURE****Compensation Procedure**

Section:	Human Resources	Number:	
Issue Date:	November 30, 2012	Effective Date:	January 1, 2013
Revision Date	March 13, 2015		January 1, 2015

Prepared by:

David Thomson
Director Human Resources &
Administration

Approved by:

Allan Crandlemire
Chief Executive Officer

PHILOSOPHY

EfficiencyOne is committed to having a compensation process that rewards high performance, is competitive within the Nova Scotia labour market at the 50th percentile, and provides a fair and equitable salary structure for all jobs.

PURPOSE

Recognize individual performance by providing a greater step increase within a pay grade for high performing employees.

Ensure each EfficiencyOne employee is fairly compensated with respect to roles and responsibilities as compared to other EfficiencyOne employees.

Within pay bands, ensure the performance-based increase for employees with current salaries below the mid-point of their pay band is greater than for employees with current salaries above the mid-point of their pay band.

Ensure EfficiencyOne's pay levels are competitive within the Nova Scotia labour market at the 50th percentile.

SCOPE

This Practice and procedure applies to all permanent employees of EfficiencyOne.

DEFINITIONS

- **"Compa Ratio"** – Ratio of actual salary / pay band maximum salary.



- **“External Equity”** – Ensuring that all jobs at EfficiencyOne are paid competitively at the 50th percentile of the market in comparison to similar jobs with other relevant employers within the Nova Scotia market.
- **“Internal Equity”** – Ensuring that all jobs at EfficiencyOne are eligible for compensation that is fair relative to other jobs within the organization in consideration of the required levels of skill, effort, working conditions and responsibility for each job.
- **“Market Increase”** – A market-driven annual increase that is applied to pay grades and to individual employee salaries in order to maintain EfficiencyOne’s 50th percentile position within the market.
- **“Pay Grades”** – EfficiencyOne classifies each job within one of 12 pay grades based on the required level of skill, effort, working conditions and responsibility required for the position as indicated by 10 factors. This evaluation is carried out through the job evaluation process.
- **“Pay Grades - Minimum Rate”** – Minimum Rate for each of our 12 pay grades based on market survey data.
- **“Pay Grades - Maximum Rate”** – Maximum rate for each of our 12 pay grades based on market survey data.
- **“Pay Grades - Mid-Point”** – Mid-point between minimum and maximum rates for each of our 12 pay grades.
- **“Step Increase”** – An increase available to each employee which, if earned based on their individual performance level and current place within their pay grade, increases their compa ratio within their pay grade.

GENERAL GUIDELINES

Internal Equity

Internal equity is achieved by ensuring that each job is correctly assigned to one of 12 pay grades through the job evaluation process, and by maintaining an appropriate pay differential between the minimum and maximum rate of each pay grade.

The job evaluation process is a critical element of achieving internal equity through classifying each job within one of the 12 pay grades based on the required level of skill, effort, working conditions and responsibility required for the position as indicated by the following 10 factors:

1. Education
2. Knowledge, Skills and Experience
3. Planning and Organizing



4. Mental/Visual Effort
5. Independent Judgment, Authority and Risk
6. Leadership
7. Problem solving/Decision making
8. Communications
9. Budget/Financial
10. Customer Service and Stakeholders

The job evaluation process is normally carried out by the direct manager of each role in conjunction with the Human Resources Department.

External Equity

External equity is achieved through an annual review of changes in the consumer price index, pattern of market increases in the Nova Scotia labour market, and EfficiencyOne's ability to pay. A full salary survey may also be carried out every three to five years if required to confirm our salaries are correctly positioned in the external market.

The external market review is carried out by the Human Resources Department. Recommendations for the annual market increase will be approved by the Executive Leadership Team and the Board of Directors.

Step Increases

Each employee will be moved up within their pay grade each year differently depending on their current performance level and compensation ratio. In general, the following principles will apply:

- Performance: employees that "Exceed Expectations" or are "Outstanding" will earn greater increases than employees that "Meet Expectations." Employees that "Need Improvement" or exhibit a "Critical Gap" will not receive an increase but will have their pay reviewed at mid-year if their performance rises above "Needs Improvement"
- Compa Ratio: employees below the mid-point of their pay grade will receive a greater increase than those above the mid-point.
- At Top of Pay Grade: employees with salaries that are at, but not above, the maximum for their pay grade will receive an increase to their base pay, in consideration for the market increase, and a lump sum payment, in consideration for any performance increase earned that is in excess of the "Meets Expectations" level, as set out in the Compensation and Performance Matrix in Appendix "A."
- Above Top of Pay Grade: employees with salaries that are above the maximum rate for their pay grade will receive a lump sum payment in consideration of market increases, and for any performance increase earned that is in excess of the

“Meets Expectation” level, as set out in the Compensation and Performance Matrix in Appendix “A.”

Details of specific step increases at all performance and compa-ratio levels are set out in the “Compensation and Performance Matrix” in Appendix “A.”

Other Administration Practices

- Timing: in general, salary increases will be made effective on January 1st each year, subject to approval of the Executive Leadership Team and the Board of Directors.
- New Employees – First Year Pay Increases: new employees hired on or after September 1st will not be eligible for a salary review until the normal cycle in the following year, except that any new employee at the entry rate of their pay grade will receive the market increase only.
- New Employees – Initial Pay Position: positioning of a new employee in a salary grade is determined at the time of hire based on the requirements of the position being filled and the qualifications and experience that the individual brings to the role.
- Existing Employees Transferring to Another Position: existing employees transferring to another position prior to September 1st will have their salary reviewed with the normal cycle. Employees transferring to a new position on or after September 1st will have their salary reviewed after finishing their three month probationary period and having a performance evaluation completed.
- Confidentiality and Communications: employee salaries are to be maintained on a confidential basis at all times. Human Resources will produce individual letters for employees each year advising of the results of the salary review. Management will meet with employees one-on-one to communicate results of the annual salary review.

RESPONSIBILITIES

Human Resources

- Overall administration of this practice and procedure
- Administration of the job evaluation process
- Administration of the performance management process
- Carry out external market reviews as required
- Make annual recommendations to the Executive Leadership Team regarding the appropriate market increase and any required pay grade changes based on market and internal equity considerations
- Provide communications documentation to managers
- Provide training and support to employees and managers as required

Managers



- Carry out job evaluation for all direct report positions
- Carry out performance evaluation for all direct reports

Executive Leadership Team

- Review Compensation and Performance Matrix annually and make recommendations for change to the Board of Directors, if needed
- Review external market data and make recommendation to Board of Directors for annual market increase
- Final approval of actual pay changes for all employees

Board of Directors

- Review and approve management recommendations for the annual market increase, normally at the November Board of Directors meeting

REFERENCES & RELATED STATEMENTS OF PROCESS

- Job Evaluation Process
- Performance Management Process

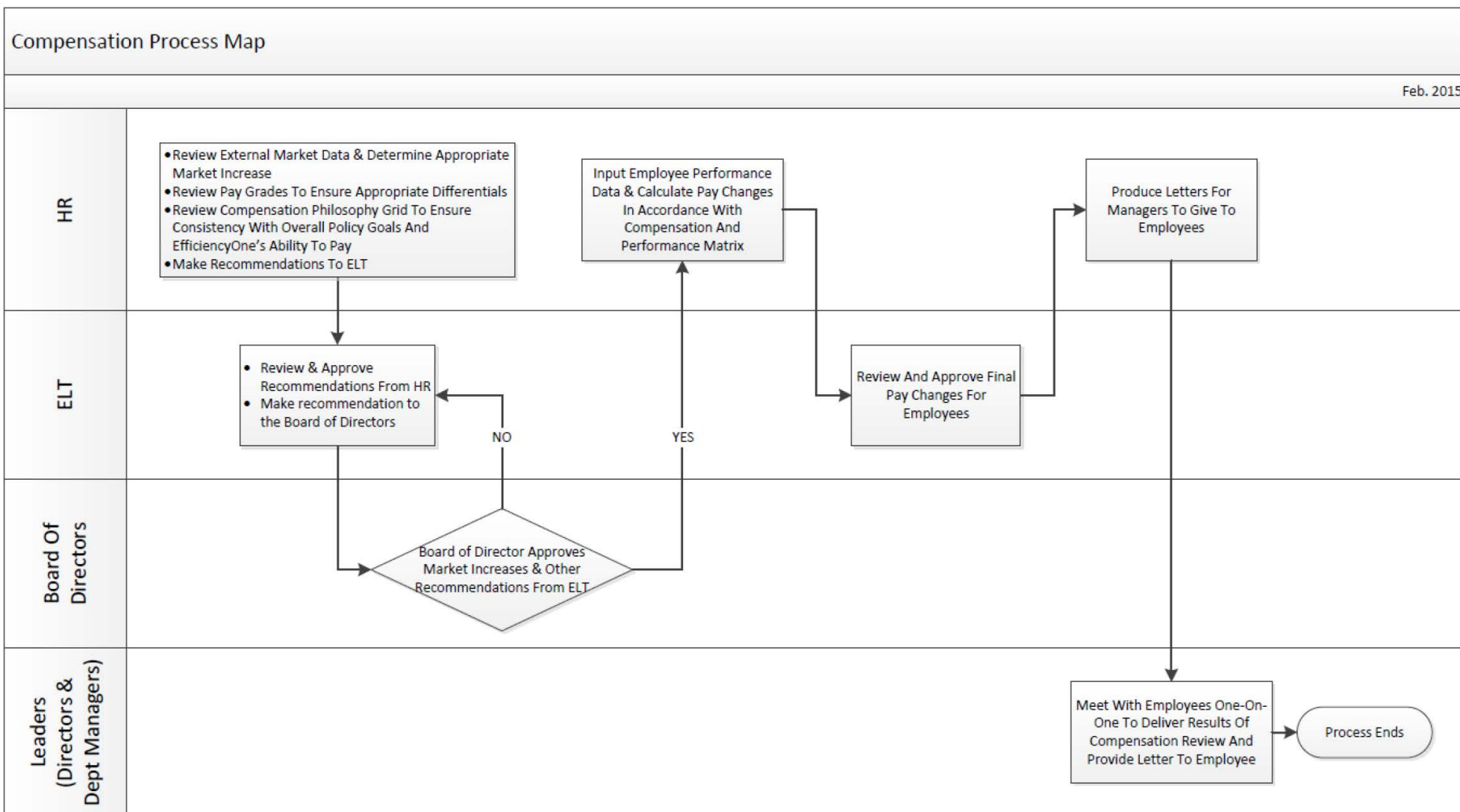
ATTACHMENTS

Appendix "A"

Compensation and Performance Matrix

		Compa Ratio			
		Entry Rate	Mid Point	Top of Pay Band	
Performance	5 Outstanding	Salary increased by market % + 6% step increase	Salary increased by market % + 5% step increase	Salary increased by market % only lump sum of 2.5% performance pay	Lump Sum equal to market + 2.5% performance pay
	4 Exceeds Expectation	Salary increased by market % + 4% step increase	Salary increased by market % + 3% step increase	Salary increased by market % only lump sum of 1.5% performance pay	Lump Sum equal to market + 1.5% performance pay
	3 Meets Expectation	Salary increased by market % + 2% step increase	Salary increased by market % + 1% step increase	Salary increased by market % only	Lump Sum equal to market
	2 Needs Improvement	No Movement (Review at Mid-Year)			
	1 Critical Gap	No Movement (Review at Mid-Year)			

Appendix "B"



NON-CONFIDENTIAL

Request IR-43:

Please provide copies of all studies, documents(s), report(s) or related rationale, used to establish compensation (as follows) for ENS and E1 (as applicable) for any portion of the period from 2011 to present:

(a) Benchmark salaries

(b) Benchmarks any other measure of compensation for salaries

(c) Benchmarks any measure of benefits costs

(d) Benchmarks any measure of overall labour costs

Response IR-43:

a) Please refer to Attachments 1 and 2, filed confidentially.

b) Please refer to Attachment 2, filed confidentially.

c) The organization worked with Morneau Shepell to develop a benefits plan structure that is aligned with normal practices in the Nova Scotia labour market, and to solicit bids from multiple providers to ensure a competitive result was achieved.

d) EfficiencyOne and ENSC have not carried out benchmarking of overall labour costs.

CONFIDENTIAL (Attachment 1)

- 1 Attachment 1 is filed Confidentially and must be accessed through the UARB Confidential
- 2 Repository.

CONFIDENTIAL (Attachment 2)

- 1 Attachment 2 is filed Confidentially and must be accessed through the UARB Confidential
- 2 Repository.

NON-CONFIDENTIAL

Request IR-44:

Please provide all compensation information (historical and forecasted/budgeted) broken down by pay component for each member of the senior management at E1 and ENS (as applicable) for each of the years from 2011 to 2018, inclusive.

Response IR-44:

Information is being provided on an aggregate basis only. Identification of this information on an individual employee basis would result in disclosure of confidential personal employment information not relevant to this proceeding. Please refer to the table below for 2011 through 2015 information. 2016-2018 DSM implementation budgets, including senior management composition, will be developed after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan. As EfficiencyOne's current Chief Executive Officer is retiring mid-year, a new CEO's input will also inform these decisions.

Senior Management Compensation - DSM Portion				
Year	Regular Wages (\$k)	Taxable Benefits (\$k)	Total Compensation (\$k)	Total FTE
2011 Actual	396	1	397	4.9
2012 Actual	575	2	577	6.0
2013 Actual	676	3	679	5.7
2014 Actual	801	1	802	5.9
2015 Budget	790	1	791	5.6

NON-CONFIDENTIAL

Request IR-45:

Please describe each employee benefit provided to an employee of E1 (e.g. medical, dental, life insurance, pension, etc.).

Response IR-45:

Please refer to the table below. EfficiencyOne matches employee contributions for benefits.

Employee Benefit	Description (Simplified) of Benefit Provided
Defined Contribution Pension	4.5% matching employer contributions
Basic Life Insurance	2 X annual earnings
Accidental Death & Dismemberment	2 X annual earnings
Dependent Life	\$10,000/spouse; \$5,000/child
Short Term Disability	66.67% of regular earnings to a maximum of \$6,500 per month
Long Term Disability	66.67% of regular earnings to a maximum of \$6,500 per month
Health: Direct Drug Hospital Vision (glasses, contact lens, laser eye) Eye exams Hearing Aids Orthotics Private Duty Nursing	80% 100% 100%; \$200 max every 24 months \$50 max every 24 months \$500 max every 5 years \$300 max per year \$10,000 max per year
Paramedical: Services such as audiologist, ophthalmologist, physiotherapist, etc. Travel benefit	\$500 maximum for each per year to a maximum of \$1,500 total per year for all combined. 60 days per trip; \$1 million maximum
Dental: Basic services Major Recalls Overall maximum Orthodontics	100% 50% once every 6 months \$1,500 combined basic & major per year 50%; lifetime max of \$2,000
Wellness Incentive	\$167 per year

NON-CONFIDENTIAL

Request IR-46:

(a) Please provide, as applicable, total annual cost (historical and forecasted/budgeted) for benefits offered by E1 and ENS (as applicable) for each of the years 2011 to 2018 inclusive.

(b) Please provide the breakdown for the employee benefit cost annually.

(c) Please provide the percentage of annual payroll for the benefit cost.

Response IR-46:

a) Please refer to the table below for 2011 - 2015 information. 2016-2018 DSM implementation budgets, including total benefit costs based on the number of employees required for UARB-approved DSM activities, will be developed after receiving the UARB's Decision on the 2016-2018 DSM Resource Plan.

Benefit Costs - DSM Portion								
Year	Employer Share					Total Payroll Costs	Benefits as % of Payroll Costs	
	Statutory (\$k)	Health & Dental (\$k)	Pension (\$k)	Total Benefit Costs			Excluding Statutory	Total
				Excluding Statutory (\$k)	Total (\$k)			
2011 Actual	129	49	66	115	244	2,064	6%	12%
2012 Actual	193	80	92	172	365	3,210	5%	11%
2013 Actual	228	103	140	243	471	3,613	7%	13%
2014 Actual	259	134	162	296	555	4,266	7%	13%
2015 Budget	236	141	202	343	579	4,279	8%	14%

b) Please refer to part a).

c) Please refer to part a).

NON-CONFIDENTIAL

Request IR-47:

- (a) Please provide the annual cost for Directors fees incurred or forecasted/budgeted by E1 and ENS (as applicable) for each of the years 2011 to 2018, inclusive.
- (b) Please provide the breakdown for the Directors fees cost annually.
- (c) Please provide all back up documentation to support, year over year increases in Directors fees.

Response IR-47:

- a) Please refer to the table below for 2011 – 2015 information. For 2016 through 2018, Directors' fees have yet to be determined.

Directors' Fees - DSM Portion				
Year	Total Honorarium (\$k)	Meeting Fees (\$k)	Employer Share (\$k)	Directors' Fees (\$k)
2011 Actual	73	75	4	152
2012 Actual	99	80	6	185
2013 Actual	111	75	7	193
2014 Actual	116	62	6	184
2015 Budget	109	90	8	207

- b) Please refer to part a).
- c) Please refer to the table below for 2011-2015 information. The Director honorarium and meeting fees have not changed since 2013. The variability in the table is due to the changes in the cost allocation FTE allocator year over year.

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Honorarium & Meeting Fees - DSM Portion									
	Monthly Honorarium			Meeting Fees			Full Day Meeting Fees		
Year	Average Director Monthly Honorarium (\$)	Year Over Year Increase (\$)	Year Over Year Increase (%)	Average Director Meeting Fees (\$) (Board/ Committee)	Year over Year Increase (\$)	Year over Year Increase (%)	Average Director Meeting Fees(\$) (Full Day)	Year over Year Increase (\$)	Year over Year Increase (%)
2011 Actual	945			352			701		
2012 Actual	919	(27)	-3%	334	(19)	-5%	600	(101)	-14%
2013 Actual	1,027	108	12%	316	(18)	-5%	568	(32)	-5%
2014 Actual	1,027	-	0%	316	-	0%	568	-	0%
2015 Budget	1,009	(17)	-2%	311	(5)	-2%	558	(10)	-2%