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August 28, 2018

Island Regulatory and Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1



Dear Commissioners:

***UE41400 - PEI Energy Corporation's
2018 – 2021 Demand Side Management Resource Plan***

Please find attached Maritime Electric's comments on the PEI Energy Corporation's initial three year DSM Plan. Maritime Electric is generally supportive of the proposed plan but offers these comments for consideration when evaluating future plans.

Overall, the spending amount of the proposed plan appears to be of appropriate magnitude based on Maritime Electric's experience with cost effective testing in the Company's previous DSM filings.

Also, Maritime Electric fully supports a transition to LED lighting and the Company expects that a large portion of the proposed plan energy savings will come from incenting and encouraging a transition to LED lighting.

If you have any questions please do not hesitate to contact me at 902-629-3668.

Yours truly,

MARITIME ELECTRIC

A handwritten signature in blue ink that reads "Angus S. Orford".

Angus S. Orford
Vice President, Corporate Planning
& Energy Supply

ASO15
Enclosure

Maritime Electric Company, Limited
UE41400 - Comments on efficiencyPEI's initial three year DSM Plan
as filed by the PEI Energy Corporation

Introduction

Maritime Electric offers two comments on efficiencyPEI's application for approval of a three year Energy Efficiency & Demand Side Management Plan ("Plan"). These are:

1. efficiencyPEI is seeking approval to use the Program Administrator Cost test as the determinant of cost effectiveness. Maritime Electric's approach differs from the methodology of this request because the Program Administrator Cost test does not include all costs. Maritime Electric's view is that the Total Resource Cost test is the appropriate test to use for cost effectiveness testing.
2. efficiencyPEI is seeking approval to do cost effectiveness testing at the portfolio level. Maritime Electric's approach differs from the methodology of this request, and views cost effectiveness testing should be done at the individual measure level. Testing at the program or portfolio level (i.e. testing a group of measures as a bundle) can result in individual measures that are not cost effective being approved for implementation.

In providing these comments, Maritime Electric is not so much concerned with efficiencyPEI's current proposed Plan as with potential future plans. Maritime Electric is generally supportive of the current proposed Plan because:

- A target spending of \$4 million annually appears to be appropriate. Based on the Company's experience with doing cost effectiveness testing for its 2010 and 2015 DSM filings, Maritime Electric believes that \$4 million per year is in line with the level of spending that can be shown to be cost effective using the Total Resource Cost test at the individual measure level.
- LED lighting is transformational. Maritime Electric expects that a large portion of the current proposed Plan's electricity savings will come from incenting and encouraging a transition to LED lighting. Maritime Electric fully supports a transition to LED lighting – much of the Company's DSM efforts of the past ten years, both proposed and implemented, have been directed toward this goal.

Program Administer Cost test does not include all costs

efficiencyPEI is seeking approval to use the Program Administrator Cost ("PAC") test as the determinant of cost effectiveness. Maritime Electric's approach differs from the methodology of this request because the PAC test does not include all costs.

The table below shows a summary of Maritime Electric's cost effectiveness testing for a potential ENERGY STAR refrigerator rebate measure. The dollar amounts shown in the table are present value amounts. The full analysis was included in Maritime Electric's 2015 Demand Side Management and Energy Conservation Plan ("2015 DSM Plan") filing. The result for the

Total Resource Cost (“TRC”) test shows this measure to be not cost effective (i.e. the benefit / cost ratio is less than 1.0) and thus Maritime Electric did not include it in its proposed 2015 DSM Plan.

2015 DSM Plan appendices		Appendix 10				
15-04-07		BENEFIT COST ANALYSIS OF ENERGY STAR REFRIGERATOR REBATE				
Free riders have not been taken into account		Participant	Utility	Rate	Total	Societal
		Cost	Cost	Impact	Resource	Cost
		test (\$)	test (\$)	test (\$)	Cost test (\$)	test (\$)
Benefits:	- Utility avoided generating capacity cost		8	8	8	8
	- Utility avoided T&D capacity cost		9	9	9	9
	- Utility avoided energy supply cost		43	43	43	43
	- Reduction in participant's bills	71				
	- Incentive rebate to participant	30				
	- Value of avoided CO2 emissions					9
	total	101	60	60	60	68
Costs:	- Utility DSM program admin. costs		10	10	10	10
	- Utility DSM program rebate costs		30	30		
	- Revenue reduction to utility			62		
	- Participant's incremental capital cost	50			50	50
	- Cost to replace lost space heating	39			39	39
	total	89	40	102	99	99
	Net benefit (cost)	12	20	(42)	(39)	(30)
	Benefit / cost ratio	1.13	1.49	0.58	0.60	0.69

Note: In some cases the sum of columns and totals shown differ due to rounding.

The column for the TRC test shows three benefits:

- Utility avoided generating capacity cost of \$8
- Utility avoided T&D capacity cost of \$9
- Utility avoided energy supply cost of \$43

The column for the TRC test also shows three costs:

- Utility (or Program Administrator) program administration costs of \$10
- An incremental cost for the ENERGY STAR refrigerator of \$50
- Cost of \$39 to replace the lost space heating provided by a less efficient refrigerator (all the electricity used in a refrigerator ends up as heat inside the building envelope)

The column for the Utility Cost (or Program Administrator Cost) test shows the same three benefits as for the TRC test. For costs, the PAC test includes the program administration cost of \$10, but it includes only a portion (the \$30 rebate) of the extra \$50 cost for the ENERGY STAR refrigerator, and it does not include any of the cost to replace lost space heating.

The fact that the PAC test does not include all the costs, as shown in the above example, results in the energy efficiency industry making statements like the one at the top of page 19 in efficiencyPEI's Evidence:

"The cost of promoting and incenting the adoption of energy efficiency is generally lower than the cost of electricity supply, transmission and distribution to customers. Levelized costs for electricity savings are typically 3-6 cents per kilowatt-hour for jurisdictions in the US Northeast and eastern Canada ...".

In the context of the above ENERGY STAR refrigerator rebate example, the 3–6 cents per kilowatt-hour cost for energy efficiency would include the \$10 for program administration and the \$30 rebate – it would not include the remaining \$20 of the extra \$50 cost for the ENERGY STAR refrigerator nor would it include the \$39 cost to replace lost space heating.

The five cost effectiveness tests shown in the above table were developed in California in the mid-1980s. Up until recently, the TRC and the Societal Cost ("SC") tests were generally used to determine cost effectiveness of potential energy efficiency and DSM initiatives. The shift in recent years to the PAC test represents a lowering of the bar for what is deemed to be cost effective. In terms of energy policy goals, such as the proposed 2% incremental annual energy saving as recommended in the 2017 PEI Energy Strategy, the shift to the PAC test is a way of having more energy efficiency deemed to be cost effective so as to be able to achieve the policy goal.

The energy efficiency industry rationale for the shift to the PAC test is given in the middle of page 19 of efficiencyPEI's Evidence:

"While it is relatively straight-forward for the TRC to account for all costs, it is difficult to account for all benefits as this requires quantifying non-energy benefits (NEBs) for participants and the electric utility. Some of these NEBs include increased comfort and health for building occupants, improved worker productivity, decreased maintenance, improved electricity system planning and reliability, the utility's ability to match demand to available capacity, and increased productivity. Accounting for NEBs can be problematic and expensive, because quantifying NEBs is location-specific and not an exact science. Not including NEBs in the equation leads to inaccurate results by counting all costs, but only a portion of the benefits."

One of the problems with the above rationale for the use of the PAC test is that it is broad brush approach. For example, many of the NEBs, such as increased comfort and health for building occupants, are related to building envelope efficiency measures, but have little or no relevance to rebates for ENERGY STAR appliances.

However, the biggest problem with the use of the PAC test in Atlantic Canada is that it does not account for the cost to replace lost space heating. The cost to replace lost space heating is more important in Atlantic than for much of the rest of North America because:

- The heating season is longer in Atlantic Canada
- There is limited availability of natural gas in Atlantic Canada for space heating. Where natural gas is available in the rest of North America, it is usually a relatively low cost fuel for space heating
- There is less residential air conditioning in Atlantic Canada than in much of the rest of North America, both in terms of penetration and cooling degree days of demand (the relevance of air conditioning is that during the air conditioning season the extra heat given off by less efficient appliances and lighting represents an increase in air conditioning load)

Thus, in summary, Maritime Electric's approach uses the TRC test (or alternately, the SC test) as the determinant of cost effectiveness.

Testing for cost effectiveness should be done at the individual measure level

efficiencyPEI is seeking approval to do cost effectiveness testing at the portfolio level for future Plans. Maritime Electric's approach differs from the methodology of this request in that cost effectiveness testing is done at the individual measure level. In energy efficiency industry terminology, a program is made up of a group of measures, and a portfolio is made up of a group of programs. If testing is done at the portfolio level, with all the proposed measures bundled together, then the likely outcome is there will be measures approved for implementation that are not cost effective on their own.

The following two tables are intended to show how bundling for cost effectiveness testing can lead to non cost effective measures being approved for implementation. The first table shows a summary of Maritime Electric's cost effectiveness testing for a \$5 rebate coupon for an LED light. As with the ENERGY STAR refrigerator rebate example, the dollar amounts are present value amounts. The full analysis was included in Maritime Electric's 2015 DSM Plan filing. The result for the TRC test shows this measure to be cost effective (i.e. the benefit / cost ratio is greater than 1.0) and thus Maritime Electric included it in its proposed 2015 DSM Plan.

2015 DSM Plan appendices		Appendix 3				
15-04-07		BENEFIT COST ANALYSIS OF REBATE FOR REPLACING 43 Watt INCANDESCENT HALOGEN WITH 11 Watt LED				
		Participant Cost test (\$)	Utility Cost test (\$)	Rate Impact test (\$)	Total Resource Cost test (\$)	Societal Cost test (\$)
Benefits:	- Utility avoided generating capacity cost		10	10	10	10
	- Utility avoided T&D capacity cost		12	12	12	12
	- Utility avoided energy supply cost		16	16	16	16
	- Reduction in participant's bills	27				
	- avoided cost of incandescent halogen lamp	4			4	4
	- Incentive rebate to participant	5				
	- Value of avoided CO2 emissions					3
	total	36	39	39	43	46
Costs:	- Utility DSM program admin. costs		5	5	5	5
	- Utility DSM program rebate costs		5	5		
	- Revenue reduction to utility			24		
	- Participant's incremental capital cost	8			8	8
	- Cost to replace lost space heating	15			15	15
	total	23	10	34	28	28
	Net benefit (cost)	13	29	5	15	18
	Benefit / cost ratio	1.58	3.86	1.14	1.53	1.65

Note: In some cases the sum of columns and totals shown differ due to rounding.

The second table shows what happens when the potential ENERGY STAR refrigerator rebate measure (which has a benefit / cost ratio of less than 1.0 for the TRC test) is bundled with the LED \$5 rebate coupon measure. This second table is based on an assumed program uptake of four LED rebate coupons for each ENERGY STAR refrigerator rebate coupon (i.e. the numbers in the ENERGY STAR refrigerator rebate table plus four times the numbers in the LED rebate table).

					BENEFIT COST ANALYSIS OF A BUNDLE CONSISTING OF ONE ENERGY STAR REFRIGERATOR REBATE + 4 LED REBATES				
					Participant	Utility	Rate	Total	Societal
					Cost	Cost	Impact	Resource	Cost
					test (\$)	test (\$)	test (\$)	Cost test (\$)	test (\$)
Benefits:	- Utility avoided generating capacity cost					49	49	49	49
	- Utility avoided T&D capacity cost					57	57	57	57
	- Utility avoided energy supply cost					108	108	108	108
	- Reduction in participant's bills			179					
	- avoided cost of incandescent halogen lamp			16				16	16
	- Incentive rebate to participant			50					
	- Value of avoided CO2 emissions								23
	total			246	214	214	230	253	
Costs:	- Utility DSM program admin. costs					30	30	30	30
	- Utility DSM program rebate costs					50	50		
	- Revenue reduction to utility						157		
	- Participant's incremental capital cost			82				82	82
	- Cost to replace lost space heating			99				99	99
	total			181	80	237	211	211	
	Net benefit (cost)			65	134	(23)	20	42	
	Benefit / cost ratio			1.36	2.67	0.90	1.09	1.20	

Note: In some cases the sum of columns and totals shown differ due to rounding.

The column for the TRC test in the above table shows that the bundle is cost effective (benefit / cost ratio greater than 1.0), which would lead to the approval and implementation of the ENERGY STAR refrigerator rebate coupon measure in addition to the LED rebate coupon measure, even though the ENERGY STAR refrigerator rebate coupon is not cost effective on its own.

The above example of bundling is based on a four to one ratio of LED rebate coupons to ENERGY STAR refrigerator rebate coupons. In reality the ratio would be more like 100 to 1, assuming 50,000 LED rebates annually and 500 refrigerator rebates annually for efficiencyPEI's proposed Plan. Thus there would be room to bundle a number of other non cost effective measures with the LED lighting rebate coupon measure, with a corresponding increase in the implementation of measures that are not cost effective on their own.

Conclusion

Maritime Electric views the Total Resource Cost test, applied at the individual program level, as the most appropriate basis upon which to assess the cost-benefit of any planned DSM or energy efficiency programs. The Company considers the target spending level proposed in efficiencyPEI's three year plan to be appropriate and fully supports the focus on LED lighting as the most effective means to achieve the program goals.