

Electricity Efficiency and Conservation (EE&C) Plan - 2022 to 2025 Application:

UE41401

Comments to the Island Regulatory and Appeals Commission

Summary of/Conclusions from the Interrogatories Responses:

(Appendices A to C provide the summary tables of the data supplied).

- 1) For the 2018 to 2022, four year extended EE&C plan:
 - a. Overall Energy and Peak Load Demand Results: (Table A):
 - i. The cumulative EE&C peak load demand reductions have been achieved: 10.8MW compared to the target of 9.8MW
 - ii. The target EE&C energy savings have not been achieved: 25GWh compared to the target of 42GWh
 - iii. The opportunities for future annual energy savings are declining
 - b. Impact of the Heat Pump Program (Table B) :
 - i. Accepting that the “electrification” of alternative heating fuels must increase the electricity energy consumed, this table shows the energy increase exceeds the total savings of all EE&C programs by over 20%
 - ii. The heat pumps peak load demand increase is significant - almost three times the EE&C programs savings.

- 2) For the 2022 to 2025, proposed three year EE&C plan:
 - a. Challenges: (Table C):
 - i. The challenges of the 2022/2025 EE&C plan are very significant; the targets are almost two times the achievements of the 2018/2021 programs.
 - ii. Extrapolating the 2018/2021 data to the expected continued deployment of Heat Pumps suggests that the net potential increase in the annual PEI Peak Load Demand could be in excess of 10% (36MW) by 2025 unless a substantive DSM plan is introduced.
 - b. Demand Response Strategy (DSM)
 - i. The proposed Plan suggests a cumulative peak load demand reduction of 20.5 MW for separate demand response programs over the three year period with a total spending of \$5.38 million. It appears that the 20.5MW reduction is in addition to the EE&C programs target reduction of 16.85MW.
 - ii. No data was supplied that links the 3 year expenditures to specific peak load reduction targets. It appears that the first year \$1M is required to scope and set a plan.
 - iii. Three DSM Program categories are listed but again there is no linked breakdown applicable to the target of 20.5MW.
 - iv. The pre-planning dialogue between ePEI and Maritime Electric has been minimal. As titled, this section is a strategy not a scoped objective plan.

Consolidating the Separation of EE&C initiatives from Demand Side Management (DSM)

The first 2018 to 2022 Electricity Efficiency and Conservation (EE&C) Plan explained that it was not a DSM plan since the focus was efficiency and conservation and not peak load demand reduction – hence the title EE&C. This replicated focus and separation for the 2022 to 2025 EE&C plan (apart from the added token “Demand Response Strategy section”) confirms the program scope but it does extend and maintain two significant issues related to Demand Side Management (DSM):

- 1) The cost/benefit inequity between electricity consumers of the first plan (2018 to 2022) continues for this second plan (2022 to 2025). By including additional program funding from our two Electricity Utilities, the benefits accrued by participating consumers inherently increases costs for those consumers who choose not to or are unable to participate.
- 2) Heat pumps offer an energy efficiency alternative for all sources of heat energy – both electricity and alternative fuels. It is appropriate that the EE&C program does not exclude alternative fuel customers from heat pump incentives but the resulting increase in peak load demand from these customers is not factored into the EE&C program return ratios; moreover it is much higher than the calculated peak load demand “savings” resulting from the electricity-based customers.

Solutions to these two issues could be:

- 1) As the EE&C plan is a PEI Government plan supporting the PEI Government’s energy strategy the Utility cost inequity between EE&C participants and non-participants should be minimized. Therefore the requirement for future program funding from both Maritime Electric Co. Ltd. (MECL) and Summerside Electric Utility (SEU) should be removed.
- 2) A peak load demand (DSM) program is clearly required to operate concurrently with the EE&C program such that the added peak load demand from new heat pump deployment is countered by a parallel DSM program. The Electric Power Act defines an “energy efficiency and demand-side resources plan” as the only mechanism for electricity conservation and costs control; it does not envisage the separation of “conservation” from “demand”. Specifically the Act permits both the PEI Energy Corporation and Maritime Electric Co. Ltd. (MECL) to introduce “energy efficiency and demand-side resources” programs by seeking regulatory approval from the Commission. As the PEI Energy Corporation is unable or has chosen not to seek approval for a DSM plan, then the Utilities should be committed. Both MECL and SEU have the customer data and the system expertise to selectively engage customers in controlling their demand load. There is a PEI Government desire to continue the EE&C initiative with a focus upon efficiency and conservation but this urgently requires a separate and companion Utility-based DSM plan. SEU has DSM programs already operating or planned; hence a DSM plan, funded by MECL customers, which specifically targets control of daily peak load should be ordered. This Utility plan will reduce the unit cost of energy for the benefit of

ALL rate payers. With a single focus upon the measurement of peak load demand at the customer site and the subsequent introduction of new demand-based incentives, this DSM plan could provide clear price signals for customers to become informed and change their energy use habits.

Suggestions for an Introductory DSM Plan without “Smart Metering”.

The first DSM plan could have two distinct phases: the first phase would not have any dependency upon the planned deployment of “Smart Metering” and the second phase would utilize the incremental deployment of Smart Meters.

One specific Residential customer segment presents an opportunity to enable both phases of a DSM plan. MECL customer data shows that less than 10% of the customer base (7000+ Residential customers) using January energy of between 2301 KWh to 5000 KWh are responsible for in excess of 50MW of the total PEI peak demand. Offering incremental demand based or time-shift incentives, over sequential years, to this relatively small consumer segment would provide a focused opportunity to directly reduce a significant portion of coincident peak load demand.

The first pre-Smart Meter program example for the target Residential segment, that does not involve any metering or infrastructure changes and can be implemented immediately, is to install interrupt timers on electric domestic hot water storage tanks such that heating is briefly interrupted during the morning and evening electricity peak demand periods. Heat storage is a perfect enabler of shifting demand; witness that both NB Power and St. John Energy are currently conducting pilot programs involving domestic hot water systems.

(For the subsequent second DSM phase, this same customer segment would be the obvious choice for the first, sequenced Smart Meter deployment and would already be primed for either smart meter remote interrupt timing or the adoption of Time-of-Day tariffs.)

Other customer segments examples for the pre-Smart Meter phase of an MECL DSM plan are:

- a) The two lowest energy-use customer tiers (customers using monthly energy below 1200KWh) comprise almost 42,000 customers and would be the last segment for Smart Meter deployment. An “Energy and Coincident Peak Demand Reduction” opportunity is to repeat each year the very successful 2010 “Winter Challenge”. More than 10,000 customers’ participated in this Challenge and over 5000 received a 10% next-month bill reduction by reducing their December (annual peak load month) energy consumption. An estimated MECL expense of \$160,000 saved over \$2,000,000 in Demand costs!
- b) For the General Service and Small Industrial customers (numbering approximately 1900 and 250 respectively) who are already metered for Demand and are used to billings that separate energy cost from Demand cost, there are opportunities to help them improve their utilization of energy - namely increasing their Load Factors (Average Demand / Peak Demand) and for some customers improving their Power Factors (Active Energy / Apparent Energy). Both forms of improvement will reduce Coincident Peak Demand. This section of the DSM plan would set out a training plan that introduces customers to the analysis of their operations and common methods for improvement. The MECL cost would be minimal and again this opportunity is not dependent upon the deployment of Smart Meters.

Summary EE&C Plan Observations and Recommendations for Consideration by the Commission.

- 1) By proposing to include additional funding from our two Utilities, the cost/benefit inequity between participating and non-participating consumers arising from the 2018/2022 EE&C programs will be repeated. Utility funding should be removed.
- 2) This proposed 2022/2025 EE&C plan has significant target challenges.
- 3) The expanded deployment of Heat Pumps will continue to increase the PEI Peak Load Demand.
- 4) To mitigate this inevitable increase in the PEI Peak Load Demand, MECL should be ordered to immediately submit a separate and companion Utility-based DSM plan:
 - a. This plan should bridge the current non-smart metering infrastructure with the intended future smart metering roll-out program by having two separate phases:
 - i. Pre-Smart Metering phase: no changes required to the existing metering infrastructure
 - ii. Smart Metering phase: sequenced roll-out of smart meters linked directly with additional opportunities for controlling Demand
 - b. Pre-Smart Metering phase: applied to most Residential customers and all currently Demand metered General Service and Small Industrial customers

I thank the Commission for the opportunity to present my assessment and hope that it assists with the consideration and disposition of the Electricity Efficiency and Conservation (EE&C) Plan - 2022 to 2025 Application: UE41401

APPENDICES:

Table A): 3+1 year Program Performance:

Year: Original Plan of 3 years extended	Planned Net Energy Savings (GWh.)	Actual Net Energy Savings (GWh.)	Actual To Planned	Planned Net Peak Demand Savings (MW)	Actual Net Peak Demand Savings (MW)	Actual To Planned
2018/2019	5.44	4.074	-25%	1.39	2.202	+58%
2019/2020	10.77	7.978	-26%	2.61	3.003	+15%
2020/2021	13.137	6.627	-50%	2.89	2.69	-7%
2021/2022	13.1	6.47	-51%	** 2.89	2.935	+2%
Totals for 3+1 years	29.35 +13.1 = 42.45 GWh	18.679+6.47 =25.15 GWh	-41%	6.89+2.89 = 9.78MW	7.895+2.935 = 10.83MW	+11%

** Data not provided; as for the energy target, the target assumed here is as for 2020/2021

Table B): 3+1 year Heat Pump Program Performance:

Heat Pumps Energy	Electricity Consumers	Alternative Fuels Consumers	Electricity Consumers	Alternative Fuels Consumers
Year	Electricity Savings (GWh.)	Electricity Added (GWh.)	Peak Demand Savings (MW)	Peak Demand Added (MW)
2018/2019	1.693	7.617	1.617	6.471
2019/2020	1.713	7.711	1.637	6.551
2020/2021	1.884	8.473	1.800	7.198
2021/2022	2.038	9.168	1.947	7.790
Totals	7.328	32.969	7.001	28.01
Resulting Annual Grid Load for HP		25.64 GWh		21.00 MW

Table C): 2022/2025 Proposed Plan challenges:

Year	Electricity Savings (GWh.)	Electricity Added (GWh.)	Peak Demand Savings (MW)	Peak Demand Added (MW)
2018/2022 Program 3/4 years	18.7 / 25.2	23.8 / 33.0	7.90 / 10.83	20.1 / 28.0
2022/2025 3 years Proposed Plan	34.45	**TBD could be 4+*= 50GWh	16.85 + 20.5 for the DSM program	**TBD could be 4*= 48MW
2022/2025 3 years Heat Pump Plan	12.29	**TBD could be 4+*= 50GWh	12.34	**TBD could be 4*= 48MW

** : the 2018/2022 Heat Pump program added four times (4*) energy and demand load savings.