



9/28/21

**Data requests for Maritime Electric Company Limited (MECL)**

At a high-level, the requests that follow are asking for all the fundamental inputs that Maritime Electric Company Ltd (MECL) used in its Integrated System Plan (ISP) analysis, and in support of its 2022 Capital Budget Application (including inputs for any model runs that may have been done), across demand-side, supply-side and transmission and distribution categories. Additional data requests may be forthcoming after review of the responses to these initial questions.

Please provide all quantitative data requested in electronic, machine-readable format (preferably Excel). Please provide all spreadsheets and workpapers with formulae intact.

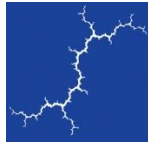
For all dollar values please indicate whether they are real or nominal. We presume all values are in Canadian dollars – confirm or explain otherwise (e.g., \$US) if this is not the case.

Responses are requested within 15 business days from receipt of this request. Synapse requests piecemeal delivery of responses for those responses that can be completed earlier than in 15 business days.

If the data requested is not available, please indicate this in the response, explain briefly why it is not available, and provide the best available alternate source of data. Synapse can sign a non-disclosure agreement (NDA) or other confidentiality documents as necessary in order to receive data, if necessary for any confidential data. This has been a matter of standard practice in many jurisdictions where we request utility data.

**Capital Budget Allocation**

1. From Maritime Electric's 2022 Capital Budget Application, approximately 40% (\$16 million) of proposed expenditures are associated with access and system growth. Approximately, 86% (\$14 million) of these expenditures correspond to the distribution system.
  - a. Has Maritime Electric analyzed how more aggressive demand side management strategies, such as deploying energy efficiency and demand response or distributed energy resources (e.g., battery storage, and solar PV) could reduce system load and potentially defer or eliminate the need for a percentage of capital expenditures? If so, provide all analysis of the sensitivity of capital requirements to the peak load trajectory (in total, or by feeder) across PEI.
  - b. If not, explain why not.
  
2. Potential new CT in 2025. (Appendix A, Summary of Actual and Proposed Capital Expenditures (2013 to 2026), 2025 and 2026 entries of \$45 and \$46 million for Combustion Turbine #4)
  - a. Has Maritime Electric conducted an analysis to determine whether a combination of distributed energy resources (e.g., battery storage, and/or battery storage plus solar PV) and demand response resources (and/or increased energy efficiency effects) could obviate or defer the need to build a new combustion turbine by 2025, or reduce the



- need to purchase additional capacity from New Brunswick? If so, please provide all such sensitivity analyses.
- b. If not, explain why not.

Integrated System Plan (ISP):

3. Tables 5 (p. 16) and 12 (p. 27) contain energy and peak load data for PEI.
  - a. Please confirm or explain otherwise that MECL's ISP is based on a single energy and peak load forecast, as seen in Tables 5 and 12.
  - b. To what extent has Maritime Electric considered the potential demand-side impacts of an updated electricity efficiency & conservation plan (EE&C plan) in any of its analysis for an integrated system plan?
  - c. If MECL has considered the potential demand-side impacts of a new EE&C plan, please provide MECL's assessment. If not, please explain why not.
4. MECL states "Programs to encourage off-peak charging will help minimize the impact on existing infrastructure and will encourage more efficient use of the system" (page iii) and also states "a failure to achieve widespread off-peak charging will lead to large infrastructure increases and associated costs to enable charging during peak periods" (page i). Table 4 (page 15) contains a PEI Electric Vehicle forecast.
  - a. Does MECL's projection of peak load as seen in Tables 5 and 12 presume "Maximum Peak Impact (MW)" from EVs, as seen in Table 4?
  - b. What level of peak load increase does MECL assume from heat pump installations on PEI, over the 2021-2030 timeframe?
5. To what extent is MECL planning to reduce peak load increases from electrifying load (i.e., EV and heat pumps) using new AMI meter technology? Please provide any estimates of peak load avoidance MECL may have based on current analyses.
6. Actual and Forecast Off-Island Energy and Capacity Source Costs:

Referencing 1) "Maritime Electric sourced 78 per cent of its energy supply from off-Island sources in 2019, including 16 per cent from a long-term participation stake in NB Power's Point Lepreau Nuclear Generating Station, and the rest through an all-services energy purchase agreement ("EPA") with NB Energy Marketing ("NBEM"). The current EPA expires in 2024". (p. 17). Table 13 Actual and Forecast Energy Sources (p. 29). Table 15 Actual and Forecast Capacity Options (p. 32). And, "[MECL] will continue to procure the bulk of its energy from the mainland as it is more economic than on-Island dispatchable resources, ..." (page 43):

- a. Table 13 and Table 15 contain actual and forecast energy and capacity from NB system purchases for 2018-2025. Please provide the projected New Brunswick energy and short-term capacity system purchases in GWh and MW from 2026-2040. If no explicit estimate exists, provide MECL's best indications for expected levels in that time frame, and include the key underlying factors that inform MECL's estimation.



- b. For actual purchases of NB system energy and short-term NB capacity purchases in 2018 and 2019 (and 2020 if available), provide the total costs in each of the years for those purchases.
  - c. For Table 13 and Table 15 forecast purchases of NB system energy and short-term NB capacity purchases in 2020 through 2025 (or in 2021 through 2025, if 2020 has been provided under “actual”) provide the estimated total costs in each of the years for those forecast purchases.
  - d. For actual purchases of NB system energy and short-term capacity in 2018 and 2019 (and 2020 and 2021 to-date if/as available), provide the actual or estimated hourly costs for those purchases for each and all hours. If actual costs are not available or not applicable on an hourly basis, provide monthly, seasonal, on-peak/off-peak, or other granular information to convey the pricing terms associated with the purchased energy and capacity.
  - e. For forecast purchases of NB system energy and short-term capacity in 2020 through 2025 (or from 2021 forward if 2020 costs have been provided as “actual”), provide the estimated hourly costs for those purchases for each and all hours. If costs are not available or not applicable on an hourly basis, provide monthly, seasonal, on-peak/off-peak, or other granular information to convey the pricing terms associated with the purchased energy and capacity.
  - f. For projected energy and system capacity purchases from NB in the 2026-2040 time frame (i.e., for quantities from the response to part a. of this question) provide an estimate of the costs of those purchases in total by year, and describe MECL’s expectations for how those costs will vary by hour, month, season, on-peak/off-peak period, as applicable for each of energy and capacity products.
  - g. Provide any further information as necessary to fully convey the nature of the costs for off-island (NB) energy and capacity purchases, and how those costs have varied or are expected to vary in the future, by hour, month, season, period, or contracted product definition.
7. Wind as a capacity resource, referencing “Wind has little capacity value as it cannot be reliably dispatched”, (page ii), and wind costs in general, “Maritime Electric intends to procure future on-Island renewable supplies at cost so it can pass any potential savings along to ratepayers” (page 43).
- a. Table 15 shows MECL using an ELCC (varying from 23% to 16% as wind penetration increases between 2018 and 2025) to determine a capacity value for wind (estimated as 26 MW total in 2026). Confirm, or explain otherwise, that MECL does count wind as a capacity resource, using the ELCC fraction, when computing overall resource capacity to meet planning reserve requirements.
  - b. Provide the underlying analysis or basis for MECL’s 2018-2025 ELCC percentage trajectory for wind resources as shown in Table 15. If no underlying analysis exists or is available, explain MECL’s reasoning for using the ELCC trajectory shown in the table.
  - c. What is MECL’s estimate for the cost and performance of new wind resources for procurement? Please be specific as to scale, timing, performance, and resource location.



- d. Indicate if the costs in part c. above are associated with the planned 40 MW farm in 2025 (footnote 24, Table 13, page 29), or other wind farms in general.
  - e. Provide any further information MECL has on the economic potential for additional utility-scale wind resources for development and related energy and capacity sale to MECL on PEI in addition to the 40 MW wind farm noted above.
8. Battery Storage costs, referencing “The cost of energy storage continues to fall as the technology matures but remains uneconomic” (page ii), and “...as such battery storage for grid operations alone is currently uneconomic based on Canadian industry costs” (page 38).
- a. Is MECL’s conclusion concerning battery storage cost economics based solely on the Alberta battery system noted on page 38?
  - b. Provide all underlying economic analyses for battery energy storage systems for use on Prince Edward Island conducted by or on behalf of MECL.
  - c. What are MELC’s projected costs for utility-scale battery energy storage systems for installation on PEI? Provide MECL’s current estimate for all cost, duration, size, performance and installation timing parameters for utility-scale battery energy storage resources potentially available for installation during the 2022-2025, and 2026-2030 timeframe.
  - d. What are MELC’s projected costs for distributed scale (i.e., installation on the distribution system, either at customer sites behind-the-meter, or in-front-of-meter anywhere on the distribution system including at MECL distribution substations or feeder locations) battery energy storage systems for installation on PEI? Provide MECL’s current estimate for all cost, duration, size, performance and installation timing parameters for distributed-scale battery energy storage resources potentially available for installation during the 2022-2025, and 2026-2030 timeframe.
  - e. What is MECL’s specific cost projection for utility-scale solar PV on PEI for the 2022-2030 time frame?
9. Customer-side, utility-controlled devices for capacity, referencing “Maritime Electric does not believe that utility control of an array of individual customer devices, with the control devices, communications and security needed to undertake the program, will provide an economic capacity resource at this time”, page ii).
- a. Provide all analyses MECL has completed that show the underlying economics of considering use of customer-side, utility-controlled devices “at this time”.
  - b. If MECL has not completed such analyses, provide any and all information MECL has underlying its belief that these sources will not provide economic capacity.

### Annual and Hourly Load Information

10. System Hourly Load Data.



- a. Provide complete Maritime Electric system hourly (8,760) load data for the three most recent years (e.g., January 2018 to September 2021). If possible, please break these data out by customer class (e.g., residential, commercial, etc.).

If hourly load data does not exist for this entire period, please provide the data for the period for which it is available.

11. If available, please provide the following hourly load/generation (MW) forecast data for 2025 (8,760) for the entire Island, and/or for MECL's own system:
  - a. Underlying or "base" hourly load;
  - b. Behind-the-meter solar PV hourly generation;
  - c. Distributed battery energy storage generation or charging load;
  - d. Energy efficiency (BAU) load reduction;
  - e. Demand response load reduction; and
  - f. Electric vehicle charging load.

If Maritime Electric does not have hourly load forecast data for each category in 2025, please provide the forecast data which is available. If MECL has available a different form of load component aggregation (such as combined solar PV, battery storage impacts), please provide.

12. Please provide Maritime Electric annual customer sales forecast (GWh) from 2020-2040 for each of the following items:
  - a. Underlying or "base" load;
  - b. Behind-the-meter solar PV hourly generation;
  - c. Distributed battery energy storage generation;
  - d. Energy efficiency (BAU) load reduction;
  - e. Demand response load reduction; and
  - f. Electric vehicle charging load.

If Maritime Electric does not have this data out to 2040 (e.g., ends at 2030), please provide the compound annual growth rate (CAGR) that can be used to extrapolate the electricity sales forecast out to 2040.

Note: Can combine battery storage and solar PV together into a category called distributed energy resources (DER) if a separate hourly breakout for Solar PV and battery storage is unavailable.

13. Please provide the Maritime Electric annual peak load forecast (MW) from 2020-2040 for each of the following items:
  - a. Underlying or "base" load;
  - b. Behind-the-meter solar PV hourly generation;
  - c. Distributed battery energy storage generation;
  - d. Energy efficiency (BAU) load reduction;
  - e. Demand response load reduction; and



- f. Electric vehicle charging load.

If Maritime Electric does not have this data out to 2040 (e.g., ends at 2030), please provide the compound annual growth rate (CAGR) that can be used to extrapolate the electricity sales forecast out to 2040.

Note: Can combine battery storage and solar PV together into a category called distributed energy resources (DER) if a separate hourly breakout for Solar PV and battery storage is unavailable.

### Fuel Price Forecasts

14. Fuel costs.

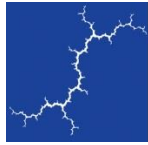
- a. Please provide the latest annual delivered fuel price forecasts for MECL dispatchable peaking generation resources between 2021 – 2040 (excluding Charlottetown steam unit). Please indicate the units for the fuel price forecasts.
- b. If the entire period is not available, please provide data for the years that are available and an appropriate growth rate to extrapolate the data out from the last year for which data is available.

Note: Preference is to receive the fuel prices in USD per barrel. However, these prices can be provided in USD per MMBtu along with the corresponding heat rates for each of the fuel options (e.g., diesel, HFO) in MMBtu/bbl.

### Energy Resource Information

15. For every planned, on-island unit coming online between 2021 and 2040 please indicate the following:

- a. Resource type (e.g., wind);
- b. Capacity (MW);
- c. Storage capacity (MW/MWh), if applicable;
- d. Capacity factor (%);
- e. Capacity credit used for capacity planning purposes;
- f. If the project is through a power purchases agreement (PPA);
- g. Planned commission date;
- h. Planned retirement date;
- i. Fixed cost for each planned unit in \$/kW-yr;
- j. Variable O&M for each planned unit on a \$/MWh basis;
- k. Forecasted capital cost expenditure for each planned unit on a \$/kW basis.; and
- l. Any recurring capital expenditure on an annual basis between 2020 and 2040.



Note: Please indicate whether the dollar values are nominal or real dollars and whether they are USD or CAD.

16. For each existing unit or import (e.g., thermal, solar, wind, NB purchase) on MECL's system please provide the following data for the historical years 2018, 2019, and 2020:

a) Hourly Generation in MWh on an 8760 basis for each year. If hourly generation is not available, please provide annual generation.

17. For each existing unit (e.g., thermal, solar, wind) on MECL's system in 2020 please provide the following:

- a. Fixed cost in \$/kW-yr on an annual basis starting in 2020 through 2040;
- b. Variable O&M in \$/MWh on an annual basis starting in 2020 through 2040;
- c. Installation date;
- d. Expected retirement date;
- e. Any recurring capital expenditure on an annual basis between 2020 and 2040;
- f. Whether the unit is dispatched economically or is a "must run" unit required to commit a minimum amount of generation; and
- g. Whether the unit is RPS eligible and the % of generation that is RPS eligible.

Note: Please indicate whether the dollar values are nominal or real dollars. We presume all units are \$CAD, but confirm or indicate otherwise.

#### Ancillary Service Information

18. Please provide the following Maritime Electric system information:

- a. Planning reserve margins
- b. MECL's estimate or assumptions for the cost of unserved energy, in the event of loss of firm load.

19. Please provide the following ancillary service information:

- a. Historical regulation up/down requirements for MECL's system for 2020;
- b. Forecasted regulation up/down requirements for MECL's system for years 2021- 2040. If data does not exist for the entire period, please provide data for the period for which it is available;
- c. A description of how the regulation up/down requirements are derived/established. If these values are derived formulaically, provide any relevant worksheets with formulae intact; and
- d. Variation in requirements due to seasonality or other expected differences in the pattern of regulation up/down requirements across the year.

Note: If data does not exist for the entire period, please provide data for the period for which it is available.



20. Please provide the following information:

- a. Historical operating reserve (e.g., spinning reserve) requirements for MECL's system for 2020.
- b. Forecasted operating reserve requirements for MECL's system for years 2021- 2040. If data does not exist for the entire period, please provide data for the period for which it is available.
- c. Please provide a description of how the operating reserve requirements are derived/established. If these values are derived formulaically, provide any relevant worksheets with formulae intact.
- d. In reference to operating reserves, please provide variation in requirements due to seasonality or other expected differences in the pattern of operating reserve across the year.