Interrogatories to MECL – E3 Report and MECL Portfolio NPV Study

1. Reference: Page 12 of E3 report, "E3 recommends that Maritime Electric perform an economic analysis on potential portfolios that account for both the portfolio's capital cost, annual costs, and ability to meet the 115 MW shortfall by 2030. The evaluations can identify the most cost-effective way to meet Maritime Electric's reliability needs". And reference: Page 52-53 of the E3 report, Capacity Value of Combined Thermal and Storage Portfolios ("…for this exploratory analysis"…) and Table 5-6.

    a. Confirm or explain otherwise that E3 did not perform an economic analysis on potential portfolios and primarily provided MECL with ten Portfolio options (numbered 1 through 10) to assess, as indicated on Table 5-6.

    b. How did E3 determine the makeup of the 10 portfolios included in Table 5-6?

    c. Why does Table 5-6 exclude any incremental wind, incremental solar PV, incremental DR, incremental interruptible load, and incremental firm NB import resources (in any combination) in exploring different portfolio options for MECL to consider for 2030?

    d. Did E3 explore possible portfolios that did include incremental wind, incremental solar PV, incremental DR, incremental interruptible load, and/or incremental NB import resources? If so, provide E3's results concerning those explorations.

    e. If E3 were to perform an economic analysis on potential portfolios to meet reliability needs, how would such an analysis optimize the results, to ensure that certain potentially lowest-cost portfolios are not excluded? Please address the following in answering the question:

        - Would a model such as E3's RESOLVE be required to conduct an economic optimization? Explain how this affects the results of any optimization.
        - Can an optimization be done by reviewing only the TRN and the PCAP shortfall for 2030, and excluding review of other years' effects?
        - How does MECL's overall energy needs, sources to meet those needs, and relative cost of energy supplies (especially PEI-based wind, vs. NB-based energy costs) factor in to such an analysis?

f. What would be the minimum planning horizon (in years) that E3 would expect to use in order to assure that reliability need procurements initially deployed in 2030 were the most (reasonably) cost-effective alternatives over the longer term?

g. Does MECL's recommended portfolio options (Portfolio 2 or 3 (response to IR-54 – Attachment 1, Portfolio Net Present Value Study, page 3) identify the most cost-effective ways to meet MECL's reliability needs?

h. Confirm or explain otherwise that the RECAP modeling and the ELCC and other results presented is limited only to calendar year 2030, and no additional RECAP modeling was performed for any other year.

2. References: i) Appendix B, Resource Adequacy Framework and Critical Periods, Figure B-2 ICAP and PCAP Accounting Convention, ii) Section B.5, Resource Accreditation, including this statement on page 73: "In this case, the application of ELCC may reasonably rely directly on the two "measurable" ELCC values: portfolio and marginal. Both are directly useful to the utility:…", and iii) Table 5-6, Combined Thermal and Storage Portfolios.

   a. At page 75, E3 states that it added two 50 MW CTs to the "base" system because otherwise the calibration mechanism or the general methodology employed to determine ELCC of candidate resources may not be appropriate. Explain how this circumstance impacts the overall robustness of the approach used, and how it affects the stability or the robustness of the resulting marginal ELCCs of candidate resources.

   b. Is there a difference between the total reliability need for MECL in 2030 (115 MW of perfect capacity), and the "procurement need" net of interactive effects, as shown in Figure B-2? If so, what is that difference in this circumstance, how did E3 calculate it, and how does it vary with different portfolios considered? Provide any workpapers in support of that calculation (in Excel file format as applicable).

   c. What portion of the 115 perfect MW need listed in each portfolio of Table 5-6 are from "interactive effects", and what portion is from "procurement need"? Provide any workpapers in support of those components of perfect MW need (in Excel file format as applicable).

   d. Provide any workpapers supporting ELCC computations behind Table 5-6 (in Excel file format as applicable).

   e. Did E3 conduct a LOLE analysis for MECL's total system, for each of the 10 portfolios in Table 5-6 considered for incremental deployment in 2030, for the year 2030? If so, provide the results of those LOLE analyses and the associated expected unserved energy heat maps for 2030 for those portfolios (in Excel file format as applicable). If not, explain why not, including discussion of these elements:

a. The extent to which each of the 10 portfolios in combination with existing MECL assets may be more or less reliable than the target 0.1 day/year associated with the LOLE parameter.

b. The difference between the overall portfolio (or cumulative) ELCC (including the existing assets) and marginal ELCC for the added resources making up the options for each portfolio.

3. Figure ES-2, Hours with Highest Loss-of-Load Risk in 2030. Page 10. Provide all data in Excel file format.

    a. Is Figure ES-2 reflective of the loss-of-load risk before any additional capacity to make up E3's projected 115 MW shortfall of perfect capacity, or after 115 MW of perfect capacity has been added to the model?

    b. Provide the underlying hourly expected unserved energy (EUE) heat map data behind Figure ES-2. Confirm or explain otherwise that these data are for each of 8,760 hours. Confirm or explain otherwise that this heat map represents a form of weighted average of the EUE seen across each of the thousands of model runs, and describe the weighting used to average the EUE values across the model runs, as applicable.

    c. If Figure ES-2 is reflective of the risk before additional capacity, what is the associated 2030 value of LOLE (in days/year) associated with the EUE heat map data seen in Figure ES-2? Provide the distribution of LOLE across the 365 days of 2030.

    d. If Figure ES-2 is reflective of the risk after 115 MW of perfect capacity is added, confirm that the modeled system in 2030 after the 115 MW of perfect capacity added reflects an LOLE value of 0.1 days/year. Provide the LOLE distribution across the 365 days of 2030.

    e. Provide the EUE heat map data and the LOLE distribution by day for 2030 after 115 MW of perfect capacity is added to the model (if Figure ES-2 reflects EUE with the shortfall of perfect capacity) or provide EUE heat map data and LOLE distribution by day for 2030 before the 115 MW shortfall addition (if Figure ES-2 reflects EUE after deployment of 115 MW of perfect capacity).

4. RECAP Model Inputs. Provide all data in Excel file format.

    a. Page 31. Provide the hourly load as used for 2030 (8760 hours) for each of 55 weather years.

    b. Describe any weighting used across the 55 weather years of load profiles when determining the LOLE or expected unserved energy seen in Figure ES-2.

    c. Appendix C, Figure C-1. Page 76. Provide the "historical loads adjusted for BTM PV, 2016-2025". Confirm that these are hourly loads.

d. Page 35. Provide the raw hourly wind generation data for each of the four wind groups for the ten years of metered data provided by MECL.

e. Page 35. Provide the hourly generation profiles that "represent expected future performance of existing and future wind resources" for each of the four wind groups. Confirm or explain otherwise that this is an 8760 hourly profile and was used to represent 2030 wind output in the RECAP modeling.

f. Page 87, Figure C-14. Provide the 8760 hourly wind profiles for each of the four wind groups as modeled as seen in Figure C-14. Confirm or explain otherwise that these profiles were used to reflect wind output in 2030 in the RECAP modeling. Explain if or how these profiles vary from the hourly profiles "that can represent expected future performance of existing and future wind resources" as stated on page 35.

g. How does the hourly profile of wind data, by wind group, seen in Figure C-14 reflect the differences in hourly output over the ten years of wind data used to develop the hourly profile used in the RECAP modeling?

h. How are the wind output profiles used in the modeling correlated to the use of 55 different weather years to reflect the load representation used in the RECAP modeling? Provide any workpapers or related information used to develop or depict the correlation between load and wind output on PEI during winter months.

i. Provide the hourly utility-scale solar PV output profile used for 2030 for the RECAP modeling. Confirm that all BTM solar resource effects are present in the hourly load profile used in each of the 55 weather years of load.

j. For each hour of the three winter months (December, January, February), for each of the 55 weather-year load representations in the RECAP modeling, provide the forced outage assumptions used for the existing thermal resources in that hour.

k. Besides Eastern Kings Phase II, were any other new wind or new solar PV resources explicitly incorporated into the resource base for the 2030 model year?

l. Confirm or explain otherwise that all Summerside Electric load, capacity and interconnection use was excluded from the RECAP modeling.

5. Figure 5-2, page 44.

    a. Provide the underlying data used to develop the graph, in Excel file format.

6. Page 26. Availability of non-firm imports. Additional reference: MECL response to Synapse 2nd Set IRs, IR-2c), where MECL states "This operational dynamic [West Cape wind energy output offsetting need for simultaneous imports from NB] is a key consideration in Maritime Electric's

planning for on-island capacity and reliability, especially during peak demand and contingency events. However, it does not change the contractual energy exchange between the utilities".

a. Confirm or explain otherwise that the hourly wind energy output from the West Cape wind farm (99 MW), contractually entitled to New Brunswick Energy Marketing, is considered as available on-island energy in the form of non-firm import energy in the RECAP modeling for MECL.

b. What wind profile is used in RECAP for the hourly energy availability from the NBEM West Cape wind farm (99 MW), and how is this considered with overall non-firm energy import availability from NB?

7. Page 39. Outage rates for storage.

a. Is the forced outage rate (5%) for storage resources based on the full capacity of the storage resource, e.g., 50 MW, or based on a fraction of the storage resource, considering the modularity of the resource?

b. Is the mean-time-to-repair for storage resources applied to the entirety of the resource, e.g. 50 MW, or to a fraction of the resource considering modularity?

8. Page 50. Figure 5-8, Cumulative and Marginal ELCC of Storage with Wind and Solar

a. Provide the workpaper and supporting computations of the graphed values.

b. Was a wind plus storage, or a wind plus storage plus solar, ELCC assessment done for 8-hour or 6-hour BESS resources, or for just the 4-hour BESS resources? If so, provide the results and any underlying workpapers.

9. Page 72. Energy sufficiency. "Properly applied, an ELCC-based framework for capacity accreditation naturally accounts for the oft-cited complications that arise as high levels of renewables are integrated, including the "shift to the net peak," the need to account for energy sufficiency as well as capacity, and the saturation effects and diversity benefits that accrue to portfolios of variable and energy-limited resources."

a. Explain how energy sufficiency for use in energy limited resources – battery energy storage systems – is directly accounted for in the RECAP model, and how in this specific modeling exercise is, or is not, a factor in the portfolio or marginal ELCC results.

b. Does energy sufficiency for use in battery storage systems on PEI limit the ELCC results for those systems in this RECAP modeling exercise? If so, describe the specific modeling input conditions which lead to such limitations.

c. Confirm or explain otherwise that the energy available from the West Cape wind farm is considered in addition to other energy sources for hourly battery charging or hourly load requirements in the RECAP model. If West Cape wind farm energy is not explicitly

available in the RECAP for energy sufficiency support, state whether or not its inclusion would impact your RECAP results for portfolio or marginal ELCC values.

10. Page 39. New wind location and operational profile.

    a. Why was "new wind" modeled with same operational characteristics and hourly profile as Eastern Kings Wind Phase II, rather than a North or West Cape location such as wind group 1?

    b. What is the difference in operational output / profile between wind resources on the eastern end of PEI, and the western/northern Cape end of PEI?

11. Page 9, 22, 28. Perfect Capacity ("PCAP") construct for reliability assessment. NPCC 2025 Maritimes Area Reliability Assessment.

    a. Is MECL required by the NPCC, NB Power, or the PEI IRAC to move to its own assessment of on-island reliability by using a "perfect capacity" model construct? Explain.

    b. Does NB Power use the PCAP construct when determining the capacity value of MECL's on-island resources?

    c. If MECL installs new capacity resources for deployment in 2029 or 2030, what capacity values will NB Power use to determine MECL's obligation to meet the 115% of peak load capacity requirement?

    d. What would NB Power's accreditation value be for a 100 MW, 4-hour, a 100 MW, 6-hour, and a 100 MW, 8-hour battery storage resource, for the purpose of accounting for MECL's requirements to meet a 15% planning reserve margin?

12. Page 22. Maritime Electric's resource adequacy practices. The 2025 NPCC Maritimes Area reliability review indicates that the Maritime region meets the 0.1 LOLE criteria by 2028 and meets it in 2029 and 2030. The 2025 NPCC Maritimes Area study includes New Brunswick, PEI, Northern Maine, and Nova Scotia.

    a. What explains the difference between E3's finding of 24 loss-of-load events (LOLE) on PEI in 2030 absent additional resources, and the 2025 NPCC Maritimes Area reliability review that meets the 0.1 LOLE threshold by 2028, and through 2030?

13. MECL Portfolio Analysis.

    a. Why did MECL choose to provide a NPV analysis for Portfolio options 1 through 5, and not for options 6 through 10?

    b. Did MECL consider analyzing any other portfolios than those provided by E3?

    c. Is MECL anticipating contracting for any new utility-scale wind or solar PV energy for use on its system over the next five years?

14. Reference: MECL August 5, 2026 submittal. Charlottetown Generating Station Site Constraints.

    a. Provide all materials MECL has used to consider site specific constraints at the Charlottetown Generation Station Site.

    b. What amount of battery energy storage, in MW capacity and MWh storage, does MECL believe is feasible at the site?

    c. List the detailed required operational and safety setback constraints known to MECL at this time and list any other specific constraints associated with the industrial site.

    d. Describe how those or other constraints affect development of the proposed CT project at the site, in comparison to development of a battery energy storage resource at the site.