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August 17, 2026

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The Island Regulatory and Appeals Commission

Ms. Cheryl Bradley
Island Regulatory and Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Ms. Bradley:

Response to Additional Interrogatories from Synapse Energy Economics
On-Island Capacity for Security of Supply Project (UE20742)

Please find attached Energy and Environmental Economics, Incorporated's ("E3") and Maritime Electric Company, Limited's ("Maritime Electric") responses to additional interrogatories from Synapse Energy Economics (Exhibit C-33) with respect to the On-Island Capacity for Security of Supply Project Application and associated Supplemental Filing, filed with the Commission on December 18, 2024, and August 14, 2025, respectively.

The responses to IR-1 through IR-12 are submitted by E3, on behalf of Maritime Electric.

The responses to IR-13 and IR14 are submitted by Maritime Electric.

Yours truly,

MARITIME ELECTRIC

Michelle Francis
Vice President, Finance & Chief Financial Officer

MF34
Enclosure

RESPONSES TO ADDITIONAL INTERROGATORIES FROM SYNAPSE ENERGY ECONOMICS

On-Island Capacity for Security of Supply Project (UE20742)

Submitted August 17, 2026

AFFIDAVIT

CANADA

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY AND APPEALS COMMISSION

IN THE MATTER of Section 17(1) of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for the approval of a 2024 Supplemental Capital Budget Request for the On-Island Capacity for Security of Supply Project.

AFFIDAVIT

I, T. Michelle Francis of Emyvale, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. I am the Vice President, Finance and Chief Financial Officer for Maritime Electric Company, Limited and as such have personal knowledge of the matters deposed to herein, except where noted, in which case I rely upon the information of others and in which case I verily believe such information to be true.

2. I prepared or supervised the preparation of the attached Interrogatory responses and to the best of my knowledge and belief the responses are true in substance and in fact.

SWORN TO at Charlottetown, Prince Edward Island, the 17th day of August, 2026.

A Commission for taking affidavits in the Supreme Court of Prince Edward Island

T. Michelle Francis

INTERROGATORIES RESPONSES FROM E3

Energy+Environmental Economics
44 Montgomery Street | Suite 1250 | San Francisco, CA 94104 | 415.391.5100 | www.ethree.com

Responses to
Interrogatories to MECL – E3 Report and MECL Portfolio NPV Study (Exhibit C-33)

August 17, 2026

IR-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.

IR-1a. 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.

Response:
Confirmed. E3 did not prepare an economic analysis of potential portfolios. E3 worked with Maritime Electric to develop the Portfolio options.

IR-1b. How did E3 determine the makeup of the 10 portfolios included in Table 5-6?

Response:
The makeup of thermal resources in the 10 portfolios was determined by Maritime Electric. In preparing these portfolios, Maritime Electric tasked E3 with calculating the quantity of 4-hour and 8-hour battery storage that would be required, incremental to Maritime Electric-specified quantities of thermal generation, to achieve the reliability standard.

IR-1c. 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?

Response:
Maritime Electric did not request that E3 include any incremental wind, solar PV, DR, interruptible load, or firm NB import resources in the portfolio analysis shown in Table 5-6.

IR-1d. 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.

Response:
E3 calculated ELCC values for incremental wind, solar PV, battery storage, DR, and combinations of solar, wind and battery storage. The results are presented in Section 5.3 of the E3 Study (Exhibit M-30, Appendix 1 to IR 23). E3 did not calculate the combined ELCC of any portfolios of these resources other than what is displayed in the report.

IR-1e. 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?

Response:

1. The purpose of an economic analysis is to identify the least-cost resource portfolio that meets a specified need. An optimization model is one tool that can be used for this purpose, but is not "required" to identify the least-cost portfolio. Optimization models are especially useful for identifying portfolios of resources from among a wide range of potential options, or over a long period of time. However, it is common practice for utilities to perform analysis for a selection of "hand-built" portfolios, particularly when the available resource options are limited.
2. Yes. Similar to an electric rate case, the LOLP study uses 2030 as a "test year" establishing parameters that can be used across multiple years. Specifically, the study identifies (1) a Planning Reserve Margin (PRM) as a function of annual peak electric load and (2) incremental ELCC values as a function of penetration relative to the annual peak load. The PRM and ELCC values are independent of calendar years.

3. The analysis should consider an appropriate range of realistically available resource options, along with their costs and performance characteristics, to ensure that the least-cost portfolio is identified.

IR-1f. 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?

Response:
There is no universal "minimum planning horizon". The appropriate horizon is the one that sufficiently captures the relative cost of the realistically available alternative portfolios.

IR-1g. 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?

Response:
E3 did not prepare an economic analysis of the potential portfolios. For Maritime Electric's assessment of the portfolio options see Exhibit M-30, IR-23 Attachment 1, Portfolio NPV Study.

IR-1h. 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.

Response: See response to IR-1e, second sub-question.

IR-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.

IR-2a. 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.

Response:

Industry best practice is to calculate marginal ELCCs relative to a system that is calibrated to achieve the reliability standard (0.1 LOLE for Maritime Electric). This is typically done by adding or subtracting small quantities of perfect capacity. However, because Maritime Electric's resource gap is large relative to its system need (115 MW of incremental capacity needed to reach the 421 MW Total Reliability Need), there may be a risk that calibrating the system by adding such a large quantity of perfect capacity could distort the system's performance during critical periods, relative to a real-life system, by mitigating the impact of some stochastic events that may contribute to system need, such as thermal generator forced outages, while magnifying the impact of others, such as wind droughts or unusually high load conditions.

Instead, E3 calibrated the system by adding two 50-MW CTs (providing 75 MW of equivalent perfect capacity) and 40 MW of perfect capacity. This calibrated system is the starting point for calculating ELCC values for all resources. The resulting system provides a more realistic simulation of thermal generation performance within the Maritime Electric system. Specifically, the incremental CTs sometimes have forced outages with an average duration of 12 hours, and this method of calibration captures the impact of these outages when calculating the ELCC values for other resources (energy storage, wind, solar, demand response), resulting in a small improvement in accuracy.

IR-2b. 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).

Response:
The Total Reliability Need (TRN) for the Maritime Electric system in 2030 is 421 MW and is independent of the portfolio. The Total Procurement Need (TPN) is the sum of marginal ELCC values for all the resources, or equivalently the load served during critical periods, in a specific, calibrated portfolio. The combined interactive effect for the portfolio is the difference between the TRN and the TPN, or 20 MW, as seen in the following table:

	MW	Calculation	Note
Total Reliability Need	**421**	a	Direct Result from RECAP
Portfolio ELCC of Current System	**306**	b	Direct Result from RECAP
Perfect Capacity Shortfall	**115**	c = a - b	

Total Procurement Need	**401**	d	Direct Result from RECAP
Interactive Effect	**20**	e = a - d	

IR-2c. 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).

Response:
The 115 MW perfect capacity shortfall includes 20 MW of interactive effects, which in this case primarily consist of wind saturation. See answer to IR-2b.

IR-2d. Provide any workpapers supporting ELCC computations behind Table 5-6 (in Excel file format as applicable).

Response: See "IR - 2D - Portfolio Analysis.xlsx".

IR-2e. 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:

- 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.
- 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.

Response:

E3 did not conduct LOLE analysis for the precise quantities of resources in each of the 10 portfolios in Table 5-6 and thus did not prepare EUE heat maps. E3 developed the portfolios by calculating cumulative incremental ELCC values for various quantities of incremental battery storage and using those values to create piecewise linear cumulative incremental ELCC functions. E3 then used these functions to calculate the quantity of storage needed to meet the 115 MW perfect capacity need. E3 calculated incremental ELCCs in 20 MW increments up to 100 MW and 50 MW increments between 100 MW and 200 MW. The incremental ELCC for the 200th MW was used for all quantities above 200 MW. This method yields portfolios that all meet the 115 MW shortfall and therefore have equivalent reliability.

The cumulative ELCC provided by each of the portfolios is the height of the cumulative ELCC function, which is represented visually for different resource types in the left-hand panels of Figures 5-5 through 5-9 and is expressed in MW. The marginal storage ELCC for each portfolio is the ELCC of the last increment of storage added to meet the target and is expressed as a percentage of nameplate capacity.

For the purpose of developing these portfolios, E3 only calculated incremental ELCCs for standalone batteries, as the incremental ELCCs of thermal resources are independent of penetration and the remainder of the Maritime Electric portfolio was held constant across the ten portfolios. The storage ELCCs were calculated for each portfolio after including the set of thermal resources in those portfolios to capture any interactive effects between the thermal and storage resources. The data associated with this aspect of the analysis is included in "IR - 2D - Portfolio Analysis.xlsx".

IR-3

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

IR-3a. 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?

Response:
Figure ES-2 is reflective of the loss-of-load risk after perfect capacity has been added to the model.

IR-3b. 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.

Response:
The heat maps reflect unserved energy that is observed across all of the RECAP simulations. The same weight is applied to each simulation. The underlying hourly expected unserved energy data is provided in the "IR - 3B" workpaper folder.

IR-3c. 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.

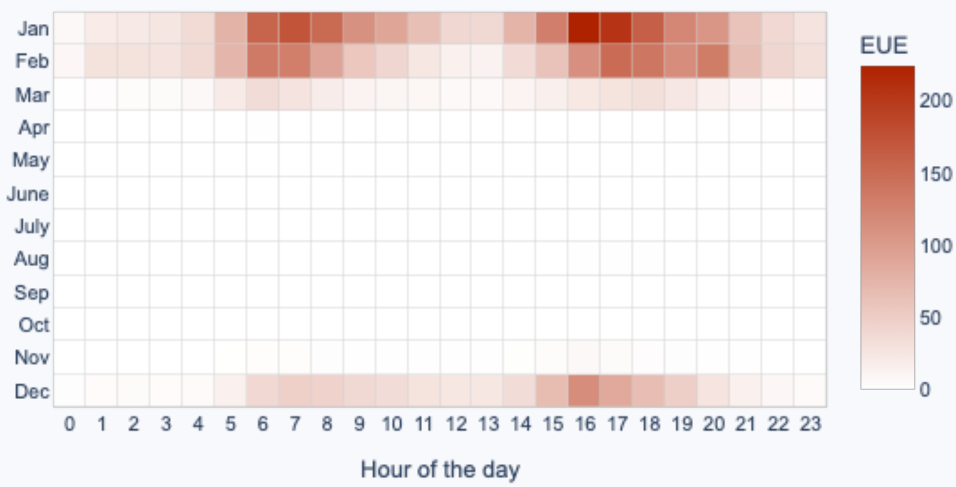
Response: Figure ES-2 is reflective of the risk after additional perfect capacity is added.

IR-3d. 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.

Response: Confirmed. For data see IR-3b.

IR-3e. 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).

Response:
The following is reflective of the risk <u>before</u> perfect capacity is added to the system. The underlying hourly expected unserved energy data is provided in the "IR - 3E" workpaper folder.



IR-4

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

IR-4a. Page 31. Provide the hourly load as used for 2030 (8760 hours) for each of 55 weather years.

Response: See "IR - 4A - Hourly Loads WY.xlsx".

IR-4b. 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.

Response: Each weather year is assigned the same weight.

IR-4c. Appendix C, Figure C-1. Page 76. Provide the "historical loads adjusted for BTM PV, 2016-2025". Confirm that these are hourly loads.

Response: Confirmed. See "IR - 4C - Hourly BTM Adjusted Loads.xlsx".

IR-4d. 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.

Response: See **"**IR - 4DEF - Wind.xlsx".

IR-4e. 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.

Response:
Each wind group is represented by ten years of hourly metered generation (2016–2025). Each year is itself an 8760 profile, adjusted per Appendix C.2 to reflect expected future performance. 2030 wind output reflects the observed distribution of wind conditions rather than one representative year. More detail on the methodology of how RECAP uses this data in Section 3 of the E3 report. The requested hourly generation profiles for the four wind groups are provided in "IR - 4DEF - Wind.xlsx".

IR-4f. 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.

Response:
Figure C-14 is not a plot of the 8760 hourly wind profiles. Rather, Figure C-14 shows the average daily capacity factor shape of each month across all 10 weather years. These averages illustrate the performance of each wind resource across an average calendar year. These averages are not inputs in RECAP. The requested hourly generation profiles for the four wind groups are provided in **"**IR - 4DEF - Wind.xlsx".

IR-4g. 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?

Response:
Figure C-14 shows a month's daily capacity factors averaged across the ten-year record. It illustrates seasonal patterns and relative output levels by wind group rather than hourly or year-to-year variability. RECAP does not use this averaged profile as an input. Rather, it uses the full ten-year chronological hourly time series for each wind group as noted in IR-4e.

IR-4h. 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.

Response:
The correlation between load and wind is established from the historical record and preserved in the simulation.

RECAP uses a stochastic rolling day-matching algorithm to extend the 10 weather years (2016-2025) of wind generation and 26 weather years (1998-2023) of solar generation data across the 55 weather years of simulated load, using the relationship observed in the years for which both load and renewable data are available. For each load day, the algorithm selects a generation day across the range of weather years for a given renewable resource type based on the correlation of that day's load and the level of renewable generation in the preceding day or days. The probability that a particular historical day is selected as a match is set by an inverse-distance algorithm. "Distance" is measured with respect to the load on the day being matched and the renewable generation over the preceding days, and candidate days closest on those measures are assigned the highest probability. The pairing is stochastic, meaning that a given load day may be matched to any of several plausible renewable profiles, so the simulation reflects a range of plausible combinations of load and renewable conditions. Candidates are further restricted to days falling within 15 calendar days on either side of the calendar position of the day being matched, with closer days more likely to be selected.

This process results in over one million simulated days across 2,750 years with hourly load, wind and solar conditions that preserve correlations or anti-correlations observed in the historical matched period for (a) electric load and renewable output, (b) seasonal patterns in load and renewable generation relationships, and (c) inter-day autocorrelations in renewable output (e.g., multi-day wind droughts). These synthetic days are then paired with 2,750 simulated years of generator outages.

IR-4i. 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.

Response:
The requested hourly generation profiles for solar are provided in "IR - 4I - Solar.xlsx".
BTM solar resources are modeled as generation resources rather than as a reduction to load. The modeled load inputs therefore represent gross load: they are not netted for BTM solar output.

IR-4j. 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.

Response:
The forced outage assumptions are the same across all hours of all seasons and all 55 weather years. These assumptions can be found in Table 4-1 in the report.

IR-4k. 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?

Response:
Besides Eastern Kings Phase II, incremental BTM solar was modeled for 2030 according to Maritime Electric's forecast.

IR-4l. Confirm or explain otherwise that all Summerside Electric load, capacity and interconnection use was excluded from the RECAP modeling.

Response: Confirmed.

IR-5

Figure 5-2, page 44.

IR-5a. Provide the underlying data used to develop the graph, in Excel file format.

Response: See “IR - 5A - Dispatch Data.xlsx”.

IR-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".

IR-6a. 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.

Response:
The energy output from the West Cape wind farm is contracted to NB Power and is therefore excluded from the calculations of on-island energy available to Maritime Electric. Only contracted firm imports are considered always available when modeling the reliability of the system. However, the resource is indirectly included through the assumption that non-firm import energy is available to Maritime Electric under certain conditions, as described in Section 4.4.2 in the report.

IR-6b. 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?

Response: See answer to IR-6a.

IR-7

Page 39. Outage rates for storage.

IR-7a. 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?

Response:
E3 modeled battery storage in 20 MW tranches up to 100 MW. The 5% forced outage rate is applied to the entire 20 MW tranche. The 20 MW unit size is below the threshold where it would meaningfully affect the ELCC value.

IR-7b. 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?

Response: See answer to IR-7a.

IR-8

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

IR-8a. Provide the workpaper and supporting computations of the graphed values.

Response: See "IR - 8A - Solar and Wind ELCCs.xlsx".

IR-8b. 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.

Response:
E3 did not calculate ELCC values for any resource combinations other than those included in the report.

IR-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."

IR-9a. 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.

Response:
RECAP directly accounts for energy sufficiency by fully accounting for all charging, discharging, and round-trip-efficiency losses for storage. These dynamics are included in RECAP simulations at every stage of the analysis.

IR-9b. 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.

Response:
Yes, energy charging sufficiency can limit storage ELCCs. RECAP accounts for energy sufficiency as stated in the answer to IR-9a, which can affect ELCCs for storage. Both duration and energy sufficiency can limit the ELCCs for storage. The study scope did not include analysis of which factor is most important in Maritime Electric's system at different levels of storage penetration.

IR-9c. 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.

Response:
As a resource contracted to serve New Brunswick load, energy from the West Cape wind farm is not explicitly available in the RECAP model. See response to IR-6a.

Inclusion of the energy from West Cape wind farm would likely not have an impact on portfolio or marginal ELCC values for at least three reasons.

- First, critical periods for Maritime Electric will often coincide with critical periods for NB Power, which would likely limit NB Power's ability or willingness to sell power from West Cape to Maritime Electric.
- Second, given the relatively high wind penetration on the Maritime Electric system, Maritime Electric's critical periods generally occur during periods with low wind production, which would also affect the West Cape wind farm.
- Finally, E3 did calculate the impact on storage ELCCs of 100 MW of additional on-island wind. The results, displayed in Figure 5-8 and Table 5-5, indicate that the additional wind has a minimal impact (0-5%) on cumulative and incremental storage ELCC values for the Maritime Electric system.

IR-10

Page 39. New wind location and operational profile.

IR-10a. 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?

Response:
New wind was modeled with the same operational characteristics and hourly profile as Eastern Kings Phase II so that new wind was represented by a higher capacity factor resource than existing wind from group 1 or 3, aligning with the expected performance of new projects. No other specific potential new project was considered nor was a corresponding generation profile developed given the scope of this analysis.

IR-10b. 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?

Response:
E3 interprets this question as related to the differences in the hourly and daily wind generation between the wind resources on eastern and northern ends of PEI. Refer to the hourly wind generation data provided in response to IR-4e.

E3 calculated the correlation between the wind resources in the eastern and northern ends of PEI. Daily capacity factors in the winter from wind in groups 2, 3, and 4 (eastern side of PEI) are 68% positively correlated with daily capacity factors from wind in group 1 (northern side of PEI).

More importantly for resource adequacy, both wind on the eastern and northern ends of PEI generate at low capacity factors during the simulated loss-of-load events, which correlates to low ELCCs. Wind from groups 2, 3, and 4 generate at a 9.1% average capacity factor during RECAP-simulated loss-of-load events, while wind from group 1 generates at an 11.9% average capacity factor during the same periods.

IR-11

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

In answering these questions, it is important to delineate the three distinct roles that NB Power plays related to Maritime Electric's resource planning and operations.

- First, as the transmission provider for Maritime Electric, NB Power administers its Open Access Transmission Tariff (OATT) and Interconnection Agreement under which Maritime Electric receives transmission service. The OATT requires Maritime Electric to submit transmission schedules in which scheduled resources equal scheduled loads in every hour. The Interconnection Agreement requires Maritime Electric to maintain a 15% Planning Reserve Margin. The Interconnection Agreement does not specify a methodology for calculating the 15% PRM or accrediting resources toward it, and in practice NB Power relies on self-reported values from Maritime Electric for this purpose.

- Second, as the Balancing Authority for New Brunswick, Prince Edward Island and Northern Maine, NB Power provides operating reserves and dispatches resources as needed to balance its power system which includes Maritime Electric's loads. NB Power's Balancing Authority function does not require any specific planning standard from Maritime Electric, however it has the authority to declare an Energy Emergency Alert (EEA) and direct Maritime Electric to shed load if there is a systemwide shortfall and Maritime Electric is unable to schedule sufficient resources to serve its load.

- Third, as the Reliability Coordinator for the Maritimes Region under authority granted to it by NPCC, NB Power conducts resource adequacy studies for the Maritimes Region as a whole. These studies do not bind Maritime Electric to any specific action. While NB Power's analysis implicitly models Maritime Electric's wind resources in calculating LOLE for the Maritimes region, further discussed in the answer to IR-12, it relies on self-reported values from Maritime Electric and Nova Scotia Power in reporting the load-resource balance for the region.[1]

Separately, in its role as a generation provider to its bundled electric customers in New Brunswick and to serve its contractual obligations, NB Power plans and operates a portfolio of generation resources. These contractual obligations include the obligation to provide Maritime Electric 190 MW of firm energy and access to its 30 MW participating share of Point Lepreau. NB Power includes only its regulatory loads and contractual obligations in its resource plans. NB Power has no obligation to and does not plan for resources needed to serve Maritime Electric's load beyond its contractually obligated quantity.

[1] North American Electric Reliability Corporation, 2024 Long-Term Reliability Assessment (December 2024): "NB derates its wind capacity using a calculated year-round equivalent capacity of 22%. NS and PEI derate wind capacity to 18% and 17%, respectively, of nameplate based on year-round calculated equivalent load carrying capabilities for their respective individual sub areas. The peak capacity contribution of grid-based solar is estimated at zero since the Maritimes area peak occurs in the winter either before sunrise or after sunset".

IR-11a. 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.

Response:
Maritime Electric is responsible under Prince Edward Island statute[2] and IRAC regulation under that statute for planning and procuring resources to serve its own load. Maritime Electric's interconnection agreement with NB Power also requires Maritime Electric to have sufficient resources available to maintain a 15% planning reserve margin. Maritime Electric is also subject to reliability standards developed by the NPCC, and approved by NERC, which specify the use of a 0.1 LOLE resource adequacy standard. None of these entities specify the method Maritime Electric must use for determining need and accrediting resources toward that need. Maritime Electric is adopting the Perfect Capacity (aka "Critical Periods") method as the emerging industry best practice, as described in the E3 report prepared for NB Power in 2025[3] and the E3 white paper *Resource Adequacy and the Energy Transition: A Critical Periods Reliability Framework and its Application in Planning and Markets*.

IR-11b. Does NB Power use the PCAP construct when determining the capacity value of MECL's on-island resources?

Response:
In its role as transmission provider, NB Power requires Maritime Electric to maintain a 15% reserve margin but relies on self-reported values from Maritime Electric in determining compliance.

In its role as Reliability Coordinator, NB Power models Maritime Electric's resources but relies on self-reported values from Maritime Electric when preparing load-resource tables.

In neither case does NB Power independently determine the capacity value of MECL's on-island resources.

IR-11c. 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?

Response: See the response to IR-11b.

[2] Prince Edward Island Electric Power Act (December 20, 2017): "Every public utility shall (a) furnish at all times such reasonably safe and adequate service and facilities for services as changing conditions require;"
[3] Appendix G - Toward a Future-Ready Resource Adequacy Framework for New Brunswick Power (October 2025), prepared by Energy and Environmental Economics, Inc. (E3) for New Brunswick Power.

IR-11d. 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?

Response: See the response to IR-11b.

IR-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.

IR-12a. 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?

Response:

The two assessments differ in scope, metric, and resource assumptions. E3's analysis covers Maritime Electric's system alone, whereas the NPCC Maritimes Area review assesses the region as a whole without distinguishing Maritime Electric's loads and resources or its limited access to firm capacity. The regional assessment implicitly assumes that resources in one jurisdiction are available to meet another's needs at any time, constrained only by the nameplate capacity of inter-provincial transmission interfaces. This means that resources in New Brunswick and Nova Scotia would be called upon to serve Maritime Electric load, even if doing so put those systems in greater jeopardy of experiencing a loss-of-load event, e.g., through depletion of their hydro or energy storage resources or increasing the likelihood of forced outages on aging thermal units.

In effect, the study implicitly assumes the existence of an Independent System Operator that dispatches all resources across the Maritimes region optimally, serving all load and allocating any load shedding requirements to all loads on a pro-rata basis without regard to resource ownership. In reality, NB Power and Nova Scotia Power are under no obligation to dispatch their resources to serve Maritime Electric loads. NB Power has no obligation to and does not plan for resources to serve Maritime Electric's loads. Each load-serving entity in the Maritimes region must plan for its own load and alone bear the consequences of any power supply shortfalls caused by its failure to procure sufficient resources.

The studies also differ in their resource assumptions. E3's result of Maritime Electric's system achieved reliability assumes only utility-scale resources online in 2025 along with gross load and BTM solar projections for 2030. The NPCC assessment of achieved reliability includes several resources not yet in service across the region, including 10 MW of storage on Maritime Electric's system, 400 MW of thermal generation in New Brunswick, 300 MW of new battery storage in Nova Scotia, and over 2,200 MW of additional wind generation. The Maritimes Area review identifies the region as in a shortfall with a loss-of-load expectation of 0.245 days/yr. in 2026 and 0.269 days/yr. in 2027. The reliability standard is only met in 2028 and beyond after these resources have come online.

Lastly, there are meaningful technical differences in how the studies treat uncertainty and variability of system conditions. Specifically, in the NPCC review, load and wind are represented by a single deterministic chronology taken from calendar year 2024, and the wind profile is held constant across the different model years of the study period. Load uncertainty enters only as a three-point scalar applied uniformly to every hour, derived from the historical error in the

Maritimes utilities' own load forecasts over a four-year planning horizon. This measures forecasting error, not weather variability. Scaling a single year's load shape upward by 4.6 or 9.2 percent raises the entire curve but does not reshape it and does not reproduce multi-day extreme cold events that did not occur in 2024.

E3's analysis, by contrast, simulates Maritime Electric's system across 55 weather years of load, 10 weather years of wind, and 26 weather years of solar. These are then used to simulate 2,750 years of hourly load, renewable generation, and generator outages. See answer to IR-4h for more details on E3's Monte Carlo simulation.

INTERROGATORIES

IR-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?

Response:

a. The net present value ("NPV") analysis results for Portfolios 6 through 10 were provided in Schedule 3 of the Portfolio Net Present Value Study ("Portfolio NPV Study"). Refer to Section 3.3 of the study for an explanation.

b. The Portfolio NPV Study relied on the portfolio results from the Maritime Electric Resource Adequacy Study ("E3 Study"). All portfolios in the E3 Study have the same ELCC (i.e., perfect capacity value) of 115 megawatts ("MW"), which enabled a true direct quantitative comparison between resource portfolio options.

The portfolios analyzed in the E3 Study were not intended to represent every possible resource configuration. Rather, they were selected to provide a reasonable range of resource portfolios capable of satisfying the identified 115 MW perfect capacity requirement by 2030. The portfolios span a broad spectrum of resource types, from portfolios dominated by dispatchable thermal generation to portfolios relying exclusively on battery energy storage systems ("BESS").

Additional renewable energy resources were not included in the portfolios because the E3 Study found that the ELCC of additional renewable resources on Maritime Electric's system is low.[1] As a result, very large quantities of additional renewable generation would be required to provide meaningful accredited capacity, making renewable resources an inefficient means of addressing the identified 115 MW capacity requirement.

c. A list of prospective utility-scale renewable energy projects seeking interconnection to Maritime Electric's electrical system is provided in Table IR-13.

[1] The marginal ELCC values for initial resource additions are approximately 8 per cent for wind generation and 3 per cent for solar generation.

TABLE IR-13 Potential Renewable Energy Projects				
Owner	**Renewable Energy**	**Location**	**Commercial Operation Year**	**Nameplate Capacity (MW)**
Private Developer	Wind	Skinner's Pond	2029	93
Private Developer	Wind	Bedeque	2028	30
Private Developer	Solar	Bedeque	2030	100
Private Developer	Solar	Bedeque	2030	40
Maritime Electric	Solar	Mount Pleasant	2028	32
Maritime Electric	Solar	Charlottetown	2029	32
Private Developer	Wind	Glenfanning	2029	30
TOTAL				**357**

It is important to note that the list above represents projects that are in Maritime Electric's interconnection request queue as part of its Open Access Transmission Tariff. To date, none of the private developer projects have executed power purchase agreements or interconnection agreements with Maritime Electric. The only two projects with any level of certainty are those applied for by Maritime Electric, which are subject to approval from the Island Regulatory and Appeals Commission.[2]

[2] Docket UE20743.

IR-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.

Response:

a. The primary constraint at the Charlottetown Generating Station ("CGS") site is the amount of available land. Excluding the Maritime Electric-owned land being used by Holland College as a parking lot, located on the northwest corner of the property (approximately one acre),[3] there are approximately 3.2 acres available for future development at the site.[4] Maritime Electric currently views the Holland College parking lot as a potential laydown area that could be used during construction of future projects at the site, including any capacity additions and the substation projects discussed below. Utilizing the parking lot as a temporary laydown area would maximize the amount of developable land available on the southern portion of the property and may allow the land to be again used by Holland College as a parking lot following project completion.

In addition to any future generation or energy storage development, Maritime Electric is planning for the existing 69 kilovolt ("kV") substation at the CGS site to be rebuilt and expects that a new 138 kV switching station will need to be constructed to support load growth in Charlottetown and Eastern PEI.[5] The new 138 kV switching station will require approximately 1.2 acres of land, reducing the remaining available development area to approximately 2 acres.

b. Through discussions with Sargent & Lundy LLC ("S&L"), Maritime Electric was advised that utility-scale BESS projects typically require approximately one acre of land per 100 megawatt-hours ("MWh") of battery storage capacity, before considering any transmission substation requirements. Based on the approximately 2 acres of remaining available development land at the CGS (if no additional CTs are added), as indicated in the response

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[3] The Holland College parking lot is located between the Wash World Car Wash and the Summit Centre at 342 Grafton Street. The property is owned by Maritime Electric and leased to Holland College.

[4] The 3.2 acres of developable area excludes land currently occupied by existing CGS infrastructure, including the 69 kV substation, the Energy Control Centre, CT3, the CT3 balance-of-plant building, and the associated fuel storage and fuel delivery systems.

[5] The need to rebuild the existing 69 kV substation and the need for a new 138 kV substation at the CGS were both identified in Maritime Electric's 2020 Integrated System Plan. Table 31, page 83.

to IR-14(a), and notwithstanding any site-specific setback, access, fire protection, or operational requirements, Maritime Electric estimates that the maximum size BESS that could be accommodated at the CGS site is approximately 200 MWh (e.g., a 50 MW, 4-hour BESS).

For reference, Maritime Electric reviewed three utility-scale BESS projects currently under construction by Nova Scotia Power. The Bridgewater, White Rock, and Waverley projects, each consisting of approximately 50 MW 4-hour battery systems, occupy approximately 2.8 acres, 3.2 acres, and 5.4 acres, respectively, within the fenced battery storage area alone.[6] These measurements do not include associated transmission substations, access roads, construction laydown areas, or other supporting infrastructure.

Determining the exact amount of battery storage that could be accommodated at the CGS site would require detailed engineering and site layout work.

c. Maritime Electric is not aware of any definitive operational or safety setback requirements applicable to the CGS site at this time. The CGS site has been used for electric generation purposes for more than 100 years and currently includes the existing CT3 combustion turbine, which entered service in 2005.

As discussed in response to IR-14(a), the primary site-specific constraint known to Maritime Electric at this time is the amount of available land, including the need to accommodate future transmission infrastructure, such as replacement of the existing 69 kV substation and construction of a new 138 kV switching station.

Maritime Electric also notes that the CGS property is located within an area designated by the City of Charlottetown as a Comprehensive Development Area. Accordingly, future development at the site remains subject to the City's planning and development approval processes.

The detailed operational requirements, safety requirements, setback requirements, and any technology-specific requirements associated with future development of the site would be determined during the upfront engineering work.

d. The primary constraint affecting development at the CGS site is the amount of available land, as discussed in response to IR-14(a). Based on Maritime Electric's review to date, this constraint is better understood for the proposed CT project than for a utility-scale BESS project.

Maritime Electric has significant experience with combustion turbine development and operation at the CGS site. The site currently includes Maritime Electric’s existing CT3, which entered service in 2005. The site has been used for electric generation purposes for more than 100 years. In addition, ProEnergy Services has visited the site and has indicated that the site can accommodate the proposed two 50 MW PE6000 combustion turbines.

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[6] The listed property sizes were roughly measured from google maps for each of the BESS sites. More information on these BESS projects can be found on Nova Scotia Power’s website – https://www.nspower.ca/cleanandgreen/innovation/grid-scale-batteries.

By comparison, Maritime Electric has not completed the detailed engineering work necessary to determine the precise space requirements, site layout requirements, fire protection requirements, operational requirements, or setback requirements associated with a utility-scale BESS project at the CGS site. Through discussions with S&L, Maritime Electric understands that utility-scale BESS projects often seek to achieve approximately 100 feet of separation between battery equipment and adjacent properties. Additionally, 50-foot setbacks may be required from oil-filled power transformers on the site. However, such distances are design objectives rather than universal requirements and may vary depending on site-specific factors, adjacent land uses, fire protection strategies, and mitigation measures. If 100-foot setbacks are required, the size of BESS that could fit at the CGS site would be very limited.

To summarize, while the suitability of the CGS site for the proposed CT project has been substantially validated through both operating experience and supplier review, the corresponding site requirements for a utility-scale BESS project remain subject to further engineering assessment.