

September 10, 2026

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



Dear Commissioners:

***On-Island Capacity for Security of Supply Project
Docket UE20742***

This letter is provided in response to the Supplemental Submission from Synapse Energy Economics, Inc. ("Synapse" and "Synapse Supplemental Submission"), filed with the Island Regulatory and Appeals Commission (the "Commission") on August 24, 2026,¹ and subsequent Corrected Table 2 ("Corrected Table 2"), filed on August 28, 2026.²

Background

The Synapse Supplemental Submission was filed one day prior to the hearing for Docket UE20742 and included a *Table 2: Illustration of First Cost of Alternative Portfolio Combinations* (page 9) with additional capacity resource portfolios. During the hearing, through cross-examination from Maritime Electric Company, Limited ("Maritime Electric" or the "Company"), Mr. Fagan of Synapse identified errors in Table 2, namely that portfolios 13 and 14 and portfolios 15 and 16 were duplicates, and that portfolio 12 contained a calculation error. Subsequently, on August 28, 2026, Synapse filed a Corrected Table 2. During the hearing, the Commission granted Maritime Electric the opportunity to provide a written response to the Synapse Supplemental Submission and the Corrected Table 2.

This letter, which constitutes the Company's response, includes the findings from a technical review completed by Maritime Electric's consultant, Energy and Environmental Economics, Inc. ("E3"), as well as findings from a review completed by Maritime Electric. The E3 review is limited to the scope of the Maritime Electric Resource Adequacy Study ("E3 Study") prepared by E3,³ whereas Maritime Electric's review is broader in nature.

Corrected Table 2 Markup

A marked-up version of the Corrected Table 2 is provided as Attachment 1. For clarity, the marked-up version of the table includes **green** markups that correspond to items identified by E3 (i.e., items 1 to 8) and **blue** markups that correspond to items identified by Maritime Electric (i.e., items 9-12). The green and blue colour scheme is maintained in the presentation of E3 and Maritime Electric items contained in this response.

¹ Exhibit C-34.

² Exhibit C-35.

³ Exhibit M-30, IR-23 Attachment 1.

E3 Technical Review

The Synapse Supplemental Submission relies on effective load carrying capability (“ELCC”) data and capacity resource portfolios contained in the E3 Study; therefore, Maritime Electric asked E3 to complete a technical review of the Synapse Supplemental Submission and the Corrected Table 2. The detailed findings of E3’s technical review are included in the memo dated September 9, 2026, (“E3 Memo”), provided as Attachment 2 and summarized herein.

E3’s review identified several key conceptual and computational errors in the Synapse Supplemental Submission and the Corrected Table 2. The errors include:

1. The selective inclusion of wind energy resources;
2. the allegation that Maritime Electric has misapplied the results of the E3 Study with respect to wind and storage diversity benefits;
3. The allegation that the Maritime Electric portfolio analysis is incomplete;
4. Misstating the ELCC value of new wind resources;
5. Misstating the ELCC value of new 8-hour battery resources;
6. Misstating the interactive effects of new wind and batteries in combination;
7. The omission of the negative diversity benefit of demand response and batteries; and
8. Not comparing portfolios with equivalent quantities of cumulative incremental ELCC values.

Importantly, the E3 Memo confirms that “Maritime Electric has correctly applied the results of the ELCC modeling [from the E3 Study]”⁴ and that the portfolios presented in the E3 Study are complete.⁵

Maritime Electric Review

In addition to E3’s review, Maritime Electric completed its own review and has identified additional issues with the Synapse Supplemental Submission and the Corrected Table 2, which are described below.

9. Impact of 15 megawatts (“MW”) of additional firm capacity from New Brunswick Energy Marketing Corporation (“NBEM”), Synapse Supplemental Submission page 5 and Corrected Table 2

Synapse states that Maritime Electric “has misapplied the results of the ELCC modelling by [...] excluding the effect that increased NB import capacity would have on the residual or resulting on-island need.”⁶ Accordingly, Synapse added 15 MW of “NB firm” capacity to all portfolios in the Corrected Table 2.

⁴ E3 Memo, page 3.

⁵ E3 Memo, page 5.

⁶ Synapse Supplemental Submission, page 5.

Maritime Electric Response: The availability of 15 MW of additional firm capacity from NBEM is based on the year 2029;⁷ however, its continued availability in 2030 is unknown. Synapse's response to IR-12 from Commission Staff, filed on May 28, 2026, and quoted below is also relevant to the topic:

"The 50% target remains reasonable, but not rigidly so, as a reliable and economic capacity structure can be in place even if the on-island percentage is lower. If NB Power has increased availability of capacity beyond 190 MW, it would be prudent for MECL to review the quantities, the timing and the costs for that capacity and compare that to the costs and benefits of on-island capacity."⁸

The existing 190 MW of firm capacity from NBEM, combined with capacity from the Point Lepreau Generating Station, represents approximately 50 per cent of Maritime Electric's total capacity need.⁹ The additional firm capacity referenced by Synapse, being 15 MW, would increase the Company's reliance on off-Island capacity resources beyond 50 per cent. In addition, as discussed during the hearing, the Company has demonstrated that off-Island capacity purchases are expected to be more expensive than new on-Island capacity, on a present value cost basis. Maritime Electric submits that the additional 15 MW from NBEM may provide a useful near-term contribution until new on-Island capacity is installed; however, it should not be considered a long-term substitute for the on-Island capacity required to address the Company's resource adequacy needs.

10. Synapse used outdated reciprocating internal combustion engine ("RICE") costs, Corrected Table 2

The Corrected Table 2 reports a RICE per unit cost of \$4.00 million per MW.

Maritime Electric Response: Maritime Electric provided updated RICE costs of \$4,308 per kilowatt (or \$4.308 million per MW), based on a Sargent & Lundy Update Letter, in its response to IR-55(b) from Commission Staff.¹⁰ This updated cost was also used in Maritime Electric's Portfolio Net Present Value Study ("Portfolio NPV Study").¹¹

Synapse does not provide a rationale for the use of \$4.00 million per MW.

11. Synapse does not account for the different useful lives of resources, Corrected Table 2

The Corrected Table 2 cost comparison does not account for the different useful lives of resources and how they impact the economics of the portfolios.

⁷ NBEM has indicated that 5 MW of additional capacity is available in 2027, 2028 and 2029, for a total of 15 MW by 2029.

⁸ Exhibit C-26, page 12.

⁹ 190 MW from NBEM and 29 MW from Point Lepreau has an ELCC of approximately 210 MW, which is approximately 50 per cent of the total perfect capacity need of 421 MW identified in the E3 Study.

¹⁰ Exhibit M-30, IR-55(b), page 51.

¹¹ Exhibit M-30, IR-54 Attachment 1, Table 7, page 17.

Maritime Electric Response: In its original April 9, 2026, report, when discussing Maritime Electric's comparison of combustion turbines ("CT") and battery energy storage systems ("BESS"), Synapse stated that "[u]sing a 50-year useful life assumption for one resource option (the proposed CT) and a 20-year useful life assumption (for the 4-Hr BESS) [...] results in distorted cost results."¹² Subsequently, Synapse recommended using battery augmentation and replacement strategies to extend the useful life of a BESS to 50 years, which it said "allows the economics of the CT and BESS resources to be directly compared to each other."¹³

Notwithstanding Synapse's earlier position, the Corrected Table 2 does not account for the different useful lives of resources, which affects the comparability of the resulting cost estimates.

By contrast, Maritime Electric adopted Synapse's earlier recommendation in the Company's Portfolio NPV Study by extending the service life of a BESS resource to 50 years, such that the costs and benefits can be evaluated over the entire 50-year study period.¹⁴

12. Synapse does not include lifecycle costs of resources, Corrected Table 2

Synapse's Corrected Table 2 includes only upfront capital costs and does not include lifecycle costs of resources.

Maritime Electric Response: The Corrected Table 2 cost comparison includes only the upfront capital cost of various portfolios. The comparison does not include fixed operating costs, CT and RICE fuel costs, BESS replacement costs, BESS charging costs, BESS ancillary services value or BESS energy arbitrage value over the useful life of the resources. As a result, the comparison is incomplete and does not provide a full lifecycle cost comparison of the portfolios.

By contrast, Maritime Electric's Portfolios NPV Study compares the lifecycle cost of portfolios and includes upfront capital costs, fixed operating costs, CT and RICE fuel costs, BESS replacement costs, BESS charging costs, BESS ancillary services value and BESS energy arbitrage value, over the 50-year study period.

Conclusion

The Synapse Supplemental Submission and Corrected Table 2 contain key conceptual and computational errors and, in Maritime Electric's view, present cost comparisons that are incomplete. Synapse testified that the Corrected Table 2 was provided for illustrative purposes only; however, because the table contains errors and does not reflect a complete lifecycle cost comparison, it adds confusion to an already complex evidentiary record. Given the circumstances faced by Maritime Electric customers, including the projected risk of loss of load events as

¹² Exhibit C-23, page 25.

¹³ Exhibit C-23, page 26.

¹⁴ Refer to Exhibit M-10, IR-54 Attachment 1, Section 3.4, page 11.

frequent as 24 days per year by 2030, it is important that the Commission have accurate and complete information to support an efficient regulatory process.

Maritime Electric submits that the Portfolio NPV Study is comprehensive, includes lifecycle costs over a 50-year study period, and appropriately applies the results of the E3 Study by comparing ten portfolios with equal ELCC contributions. Accordingly, the Portfolio NPV Study provides the most robust and complete cost comparison for the Commission's consideration in this proceeding.

We trust this now concludes this application and look forward to the Commission's decision.

Yours truly,

MARITIME ELECTRIC



Michelle Francis
Vice President, Finance & Chief Financial Officer

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Attachments

Table 2. Illustration of First Cost of Alternative Portfolio Combinations

Incremental Nameplate MW	Project P2	Project CT only	P11	P12	P13		P15	
Project CT	100	100						
On-island wind			100	100	100		100	1
8-Hour BESS					50		100	
4-Hour bess	9		50	100				
RICE	40		40	40	40		20	
DR	3	3	3	3	3		3	
NB firm	15	15	15	15	15		15	9
Total Nameplate Excl DR, NB	149	100	190	240	190		220	
Marginal ELCC for Amount Listed Above								
Project CT	75.0%	75.0%						
Wind			6.0%	6.0%	6.0%		6.0%	
8-Hour BESS			77.4%		77.4%		64.4%	
4-hour BESS	67.2%		56.3%	43.8%				
RICE	86.0%	86.0%	86.0%	86.0%	86.0%		86.0%	
DR	95.0%	95.0%	95.0%	95.0%	95.0%		95.0%	
NB firm	97.0%	97.0%	97.0%	97.0%	97.0%		97.0%	
Perfect Capacity MW								
Project CT	75.0	75.0						
Wind			6.0	6.0	6.0		6.0	4
8-Hour BESS			0.0	0.0	38.7		64.4	5
4 hr bess	6.0		28.2	43.8	0.0		0.0	
RICE	34.4		34.4	34.4	34.4		17.2	
DR	2.9	2.9	2.9	2.9	2.9		2.9	7
NB firm	14.6	14.6	14.6	14.6	14.6		14.6	
Total Marginal	132.8	92.4	86.0	101.6	96.5		105.0	
Interactive %	0%	0%	5%	5%	5%		5%	2 6
Interactive MW	0.0	0.0	4.3	5.1	4.8		5.3	
Total ELCC MW	132.8	92.4	90.3	106.6	101.3		110.3	3 8
Cost per unit - \$MM/MW								
Project CT	3.53	3.53	3.53	3.53	3.53		3.53	
Wind								
8-Hour BESS	3.84	3.84	3.84	3.84	3.84		3.84	
4 hr bess	2.40	2.40	2.40	2.40	2.40		2.40	
RICE	4.00	4.00	4.00	4.00	4.00		4.00	10
Cost, \$ Millions								
Project CT	353.0	353.0	0.0	0.0	0.0		0.0	
Wind	0.0	0.0	0.0	0.0	0.0		0.0	
8-Hour BESS	0.0	0.0	0.0	0.0	192.0		384.0	
4 hr bess	21.6	0.0	120.0	240.0	0.0		0.0	
RICE	160.0	0.0	160.0	160.0	160.0		80.0	
Total Build Cost Excl NB and DR	534.6	353.0	280.0	400.0	352.0		464.0	12
Total build cost per ELCC capacity	4.02	3.82	3.10	3.75	3.47		4.21	11

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Response to Synapse Energy Economics August 24, 2026 Supplemental Submission to Prince Edward Island Regulatory and Appeals Commission

UE20742 – Maritime Electric Supplemental Capital Budget Request for MECL's On-Island Capacity for Security of Supply Project

September 9, 2026

Summary

Energy and Environmental Economics (“E3”) was retained by Maritime Electric Company, Limited (“Maritime Electric”) to provide support in the above-referenced docket by performing loss-of-load probability analysis to (1) quantify Maritime Electric’s need for new capacity, and (2) calculate the effectiveness of new resource options toward meeting that need. This work was presented in E3’s final report titled *Maritime Electric Resource Adequacy Study: Determining 2030 System Needs and Evaluating Effective Load Carrying Capability* (“E3 Report”), which was filed as IR-23 – Attachment 1 on July 24, 2026. E3’s principal conclusions were that (1) Maritime Electric faces a power supply shortfall equal to 115 MW of equivalent perfect capacity by 2030, (2) thermal generation options with unit sizes of 50 MW and below are highly effective at meeting this need and are not subject to saturation effects, (3) incremental wind and solar generation provide very small contributions to resource adequacy, (4) between 40 and 60 MW of battery energy storage systems could also be effective at meeting part of this need, but the value of incremental additions beyond this amount is limited due to saturation and diminishing marginal returns, and (5) filling the entire gap without at least 75 MW of perfect capacity contribution

from thermal generation would require unrealistic and cost-prohibitive quantities of batteries.

E3's scope also included reviewing and evaluating the materials previously submitted by Synapse Energy Economics to identify and correct any technical flaws. These were addressed in E3's direct testimony to the Commission on August 26, 2026. Maritime Electric has now asked E3 to review Synapse's Supplemental Submission filed on August 24, 2026 ("Supplemental Submission"). This memo provides the results of E3's review. E3 finds that the Supplement Submission contains numerous conceptual and technical errors, and that nothing in it alters the primary evidence in the docket that the lowest cost option to address the 115 MW power supply shortfall includes Maritime Electric's proposed ProEnergy combustion turbine ("CT") project.

E3 Response

The Supplemental Submission includes a discussion of the E3 Report and Maritime Electric's use of its results in preparing its Portfolio Net Present Value Study of the ten portfolio options presented in Figure 5-10 on p. 54 of the E3 Report, as well as a table of "alternative portfolio combinations" (Table 2 of the Supplemental Submission). In this section, E3 identifies and responds to key conceptual and computational errors in the Submission. E3's responses are primarily qualitative in nature; E3 has not conducted additional quantitative analysis of the Synapse portfolios.

1. Selective Inclusion of Wind Energy Resources, Supplemental Submission pp. 3-4

Synapse states that "[t]he presence of new on-island wind complements the presence and hourly availability of New Brunswick non-firm energy as a charging source for the battery. It is the combination of energy and battery energy storage capacity that provides effective capacity, not the battery alone." Synapse includes 100 MW of wind for Portfolios 11-16, providing a putative 6 MW* of cumulative ELCC value (the correct ELCC is 7 MW, as will be noted below), but does not include any costs for these resources based on the

unsupported rationale that the wind energy will displace higher cost energy purchases from NB Power.

E3 Response: E3 and Maritime Electric did not include additional wind in the portfolio because it provides very low incremental ELCC value, both alone and in combination with battery storage. However, Synapse’s selective inclusion of “free” ELCC value yields a savings of \$24-30 million in capital costs for their P11-P16 portfolios. It is inappropriate to attribute the capacity value of these wind resources solely to Portfolios 11-16, as doing so selectively advantages those portfolios while excluding a comparable benefit that would be available across the full range of portfolio options. The “free” wind resources would provide similar value under the Portfolios 1-10 options studied by E3 and Maritime Electric. Therefore, a more accurate portfolio analysis would include these resources in all portfolios, as Synapse has done for the 3 MW of incremental demand response.

2. Allegation that MECL has misapplied the results of the E3 Report with respect to wind/storage diversity benefits, Supplemental Submission p. 5

Synapse states that “Based on our review thus far, it is our opinion that MECL has misapplied the results of the ELCC modeling by not addressing any additional interactive effects that would arise from a total portfolio including additional new capacity...”

E3 Response: Maritime Electric has correctly applied the results of the ELCC modeling. E3’s white paper entitled *Resource Adequacy for the Energy Transition: A Critical Periods Reliability Framework and its Application in Planning and Markets*, attached as Appendix B in the E3 Report, describes the application of this framework to system planning. E3 worked with Maritime Electric to ensure that the method was applied correctly as described in the white paper.

E3 agrees that adding wind and batteries in combination results in a diversity benefit such that the combined cumulative ELCC is greater than the sum of the cumulative ELCC values provided by the individual resources. However, this benefit is very small: 100 MW of wind provides no measurable diversity benefit for 40 MW of battery storage, and only 2 MW of diversity benefits for 60 MW of battery storage.

The cumulative incremental ELCC values presented by E3 in Figure 5-8 and Table 5-5 of the E3 Report correctly report the diversity benefit of adding wind and batteries in combination. The diversity benefit can be calculated by subtracting the Incremental ELCC of 4-hour storage (standalone), provided in the first row of Table 5-5 of the E3 Report, from the Incremental ELCC of 4-hour storage with 100 MW of wind, provided in the third row of Table 5-5.

The diversity benefit of 100 MW of wind combined with various quantities of battery storage is provided in Table 1 below. The first two rows of the table are the ELCC values of various tranches of 4-hour battery storage, added on a standalone basis (first row) and with 100 MW of incremental wind (second row), repeated from Table 5-5 of the E3 report. The third row derives the diversity benefit, in MW, by subtracting the cumulative incremental ELCC of standalone batteries from the cumulative incremental ELCC of batteries with 100 MW of incremental wind generation. The fourth row divides the diversity benefit in MW by the total nameplate capacity of the incremental storage and wind resources. The calculation demonstrates that the diversity benefit of combinations of storage and wind on the Maritime Electric system is 2% or less of the incremental storage and wind nameplate capacity, even when 300 MW of new resources (200 MW of 4-hour batteries and 100 MW of wind) are added.

Table 1: Derivation of the wind + storage diversity benefit from various tranches of battery storage with 100 MW of incremental wind generation

Capacity Value (Effective MW)	Model Year 2030						
Tranche Size	20	40	60	80	100	150	200
4-hr Storage (Standalone)	13	25	32	38	43	54	61
4-hr Storage with 100 MW Wind	13	25	34	41	46	58	67
Diversity benefit of storage + 100 MW of wind (MW)	0	0	2	3	3	4	6
Diversity benefit of storage + 100 MW of wind (% of total nameplate)	0%	0%	1%	2%	2%	2%	2%

3. Allegation that the Maritime Electric portfolio analysis is incomplete, Supplemental Submission p. 6

Synapse states that “[t]he specific modeling conducted by E3 for MECL is not a comprehensive assessment of the reliability of the limited set of portfolios selected for review by MECL... E3 did not conduct any final iterative processes to check the relative reliability of total MECL portfolios, and to ascertain the final “interactive effects” that would be present in any given portfolio.”

E3 Response: The reliability modeling is complete. Each of the portfolios presented in Table 5-6 and Figure 5-10 of the E3 Report provides 115 MW of incremental ELCC value. E3 calculated the ELCC values by adding 4-hour and 8-hour battery storage to an underlying Maritime Electric Portfolio that included specified quantities of thermal capacity in addition to Maritime Electric’s existing resources, until the 115 MW gap was precisely filled. The ELCC values are inclusive of all interactive effects, including the diversity benefit of incremental storage with Maritime Electric’s existing 119 MW of wind resources.

4. Synapse misstates the ELCC value of new wind resources, Supplemental Submission Table 2

Synapse Table 2 reports the cumulative incremental ELCC value of 100 MW of new wind to be 6 MW.

E3 Response: The correct cumulative ELCC value of 100 MW of new wind is 7 MW, as provided in Table 5-5 of the E3 Report.

5. Synapse misstates the ELCC value of new 8-hour battery resources, Supplemental Submission Table 2

Synapse Table 2 reports the cumulative incremental ELCC value of 100 MW of new 8-hour battery storage to be 64 MW.

E3 Response: The correct cumulative ELCC value of 100 MW of new 8-hour battery storage is 62 MW, as presented in Table 5-5 of the E3 Report.

6. Synapse misstates the interactive effects of new wind and batteries in combination, Supplemental Submission Table 2

Synapse Table 2 reports the cumulative interactive effects of new wind and battery storage as follows:

- 100 MW of new wind and 50 MW of new 4-hour battery storage: 4.3 MW.
- 100 MW of new wind and 100 MW of new 4-hour battery storage: 5.7 MW.
- 100 MW of new wind and 50 MW of new 8-hour battery storage: 4.8 MW.
- 100 MW of new wind and 100 MW of new 8-hour battery storage: 5.3 MW.

E3 Response: Synapse does not describe how these values are calculated, however they are incorrect. The correct diversity benefit for new wind and 4-hour battery storage, as presented in Table 5-5 of the E3 Report and Table 1 above, are as follows:

- 100 MW of new wind and 50 MW of new 4-hour battery storage: 1 MW.
- 100 MW of new wind and 100 MW of new 4-hour battery storage: 3 MW.

E3 did not provide any calculations of the diversity benefit of 100 MW of wind with new 8-hour battery storage, however, given the very small diversity benefit for 4-hour batteries and the much higher cost of 8-hour battery storage, this omission is not material.

7. Synapse omits the negative interactive effects of demand response and batteries, Supplemental Submission p. 5 and Table 2

Synapse Table 2 reports the cumulative incremental ELCC value of 3 MW of new demand response resources as 2.9 MW, using an ELCC value of 95%, without incorporating its interactive effects with battery storage.

E3 Response: Demand response and battery storage both provide a similar, short-duration response, and adding them in combination results in a negative interactive effect. As shown in Table 5-4 of the E3 Report, adding 20 MW of DR and 20 MW of 4-hour battery storage results in a negative interactive effect of 5.3 MW, equal to 26% of new DR capacity. While the exact size of the negative interactive effect will depend on the quantity of the incremental batteries and DR capacity (growing larger as more capacity is added), all of the Synapse alternative portfolio options include more than 40 MW of combined battery

storage and DR capacity. Therefore, Synapse should have included a negative interactive effect of at least 0.8 MW to the 3 MW of DR capacity (26% times 3 MW).

8. Synapse does not compare portfolios with equivalent quantities of cumulative incremental ELCC value, Supplemental Submission Table 2

The cumulative incremental ELCC values of the portfolios included in Table 2 of the Supplemental Submission are not equivalent. The revised Portfolio 1 provides 133 MW of effective capacity, while Portfolios 11-16 provide between 90.3 and 110.3 MW of effective capacity. None of them provides the quantity of capacity needed to precisely fill the 115 MW resource gap. This makes any cost comparison among the portfolios difficult and potentially spurious, especially considering that the quantities of batteries added are in the range where the cumulative ELCC values are meaningfully impacted by saturation.

E3 Response: A more direct and meaningful comparison would be between portfolios that include the same MW of effective capacity, sufficient to close the 115 MW gap, as done by E3 and Maritime Electric. The cost of meeting the full 115 MW gap cannot be extrapolated from the costs of the incomplete portfolios shown.

Moreover, the ELCCs calculated by E3 are measured relative to a reliable system, including perfect capacity to fill any remaining gap. The ELCC values calculated by E3 would not be valid for a portfolio that only partly fills the capacity shortfall, i.e., that leaves a meaningful reliability gap.

Conclusion

There are numerous conceptual and technical errors in the Synapse Supplemental Submission. When correcting for these errors, nothing in the Submission alters the primary evidence in the docket that the lowest cost option to address the 115 MW power supply shortfall includes Maritime Electric's proposed ProEnergy combustion turbine ("CT") project.