Public Utilities Board
NEWFOUNDLAND & LABRADOR
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2024-08-30

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Dear Madam/Sirs:

Re: Newfoundland and Labrador Hydro - Reliability and Resource Adequacy Study Review to Parties - 2024 Resource Adequacy Plan - Issues List

Enclosed is the final Issues List for the review of Newfoundland and Labrador Hydro's 2024 Resource Adequacy Plan.

The Island Industrial Customer Group and Newfoundland Power both provided comments on the draft Issues List circulated on August 22, 2024 but did not raise issues to be added or deleted. Their comments will be considered as we moved forward with the process.

If you have any questions, please do not hesitate to contact the Board's counsel in this matter, Ms. Maureen Greene, KC, by email mgreene@pub.nl.ca or telephone (709) 726-3175.

Sincerely,

Jo-Anne Galarneau
Board Secretary

JG

Enclosure

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Public Utilities Board
NEWFOUNDLAND & LABRADOR

Newfoundland and Labrador Hydro
Reliability and Resource Adequacy Review
Issues List
Dated: August 30, 2024

Issue 1: Load Forecast

- Is NLH's decision to base its "Recommended Expansion Plan" on a load forecast scenario that is most conservative reasonable?

- Is NLH's pre-filed load forecast reasonable, or should it be adjusted or re-assessed?

    - Were the EV adoption and impact on load shape[1] assumptions reasonable, including addressing the fact that the reference case does not achieve provincial targets, and should they be updated with the expected Posterity Study?

    - Are NLH's assumptions regarding demand-side resources (energy efficiency, demand-side management, conservation)[2] reasonable?

    - Are assumptions regarding population growth and its impact on load adequately addressed?

    - Are heating electrification assumptions adequately addressed and justified?

    - Is there sufficient consideration of different levels of potential future industrial load growth?

- NLH's assumed load shape for the IIS is based on a base hourly load profile from a representative year with average weather conditions, which is then scaled to meet peak and energy forecasts.[3] Is this a reasonable approach and has it been sufficiently supported in the filing?

- NLH has attempted to capture the impact of changes in electricity rates on demand for electricity in its RAP modeling.[4] Has NLH done so in a reasonable manner, or are additional sensitivities/considerations needed?

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1 2024 Resource Adequacy Plan, Appendix B, section 5.1.1.3.

2 2024 Resource Adequacy Plan, Appendix C, section 4.1.

3 2024 Resource Adequacy Plan, Appendix B, section 5.1.1.3.

4 2024 Resource Adequacy Plan, Appendix C section 7.4.2.

- The load forecast was prepared in the third quarter of 2023. Does it need to be updated now or at what time during the process should it be revised?

Issue 2: Reliability Planning Criteria

- NLH recommends continuing to plan for the IIS and the LIS separately at this time. Is this reasonable?

- NLH recommends continuing with the 2.8 hours per year LOLH criteria at this time and not the 0.1 LOLE previously recommended. Is this reasonable for planning at this time?

- The energy planning criteria is that the IIS should have sufficient generating capability to supply all its firm energy requirements with firm system capability. Is this planning criteria reasonable?

- For the purpose of its operational reserves NLH considers the first contingency loss to be the loss of a generating unit at Muskrat Falls and the second contingency to be the loss of a second Muskrat Falls unit. Daymark said that the loss of the LIL as the largest single contingency merits further review.[5] What is the reasonable first and second loss contingency to use for planning purposes?

- NLH's "Recommended Expansion Plan"[6] is based on planning reserve margin of 17.1 percent, as contained in Expansion Plan Scenario 4.[7] Is this a reasonable planning reserve margin for purposes of the RAP filing? Other planning reserve margins reviewed in the RAP filing reach as high as 35.1 percent.

- Expansion Plan Scenario 4 relies on a 2.8 LOLH, a 1% LIL bipole equivalent forced outage rate,[8] and the Slow Decarbonization IIS load forecast scenario. Each is the most conservative value reviewed (in terms of impact on forecasted capacity and energy system needs). Are these reasonable assumptions?

- NLH's "LIL Shortfall Analysis" considered the reliability impact of a "prolonged" outage of the LIL. It included certain assumptions regarding the timing (winter) and length (six weeks) of the outage,[9] CBPP capacity assistance,[10] Vale customer

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5 2024 Resource Adequacy Plan, Appendix A, pages 9-10

6 2024 Resource Adequacy Plan, Appendix C, section 8.0.

7 2024 Resource Adequacy Plan, Appendix C, Table 4.

8 The LIL bipole equivalent forced outage rate from April 1, 2023 to June 1, 2024 was approximately 2.34%.

9 2024 Resource Adequacy Plan, Appendix B, page 38 lines 14 to 15. (**All page numbers reference the "PDF" page numbers listed at the top right of the document, not the page numbers listed in the bottom right of the document.**)

10 2024 Resource Adequacy Plan, Appendix B, page 39 lines 1 to 2.

generation,[11] and minimum regulating reserve.[12] Were these reasonable assumptions, and were all assumptions in the analysis made clear (e.g., load shedding/curtailable load assumptions)?

- The results LIL Shortfall Analysis appear to show a tradeoff between cost and reliability.[13] Do the results support NLH's Recommended Expansion Plan, as best contained in "Combination 3"?[14] Should the reliability basis for the tradeoff analysis be based on the cost of an outage using a standard metric, such as the value of lost load?

- Are there any other planning criteria considerations that should be addressed by NLH, beyond those considered in the RAP filing?

Issue 3: Existing Generation and Transmission

- Has NLH appropriately considered the extension of the Holyrood plant beyond 2030 if required? What are the capital and operating costs associated with Holyrood remaining in service until 2030 and longer if necessary? How have these costs been considered in the analysis?

- What enhancements, if any, are possible to improve the reliability and forced outage rate for the LIL? What is the updated status of ongoing work to improve LIL reliability? Should the LIL be regarded as an energy-only line for planning purposes?

- Are the forced outage rates for existing generation used in the planning analysis(referred to specifically in Issue 6 reasonable?

- Regarding the on-Avalon transmission constraint:

    - Was the TransGrid study[15] sufficient, or should it be updated/supplemented?

    - Has NLH provided a reasonable set of cost estimates for the potential[16] and recommended transmission upgrades identified in the TransGrid study,[17] and have those estimates been supported?

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11 2024 Resource Adequacy Plan, Appendix B, page 39 lines 4 to 5.

12 2024 Resource Adequacy Plan, Appendix B, section 5.1.5.

13 2024 Resource Adequacy Plan, Appendix C, section 7.2.

14 2024 Resource Adequacy Plan, Appendix C, section 7.2.3.

15 2024 Resource Adequacy Plan, Appendix B, section 5.4.1.1; 2024 Resource Adequacy Plan, Appendix C, section 7.3.1.

16 2024 Resource Adequacy Plan, Appendix C, section 7.3.2.

17 2024 Resource Adequacy Plan, Appendix C, section 7.3.3.

Issue 4: Supply Resource Options

- NLH explains that it accounted for ECDM activities in its load forecast.[18] For potential future ECDM initiatives, such as time of use rates and critical peak pricing, NLH states these programs have not been historically cost effective[19] and that a third-party firm (Posterity) is working on a "new CDM potential Study to assess the technical, economic, and achievable potential for ECDM activities on the [IIS] from 2025 to 2040."[20] Has NLH given due consideration to ECDM solutions in its analysis for the planning horizon?

- NLH appears to assume between 130 MW[21] and 139.2 MW[22] of Capacity Assistance, including curtailable load. Is this a reasonable assumption?

- Regarding NLH's consideration of hydroelectric generation options,[23] has NLH adequately considered potential solutions, including expansion projects, new projects, and uprates, as well as smaller hydro additions?

- Regarding CT generation:

    - Are any updates needed for the Hatch "CT Options Report"[24] from 2023?

    - Was selection of the SCCT as the preferred option[25] reasonable?

    - Does the requirement that that the CT be capable of transitioning to a renewable fuel source add to the cost and procurement schedule and, if so, by how much?

    - Given the conclusions of the "Fuel Market Study,"[26] what are the considerations and mitigations needed to address fuel supply risk related to CT generation?

    - Has NLH given due consideration to grey market CT generation units?[27] Does the selection of the SCCT selected by NLH affect availability on the grey market? In light of the availability, compatibility with Canadian standards, fuel availability and other challenges pointed put in the Hatch report should NLH consider tendering an international solicitation for a turn-key project or PPA for the 150 MW CT?

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18 2024 Resource Adequacy Plan, Appendix C, page 28 lines 21 to 23.

19 2024 Resource Adequacy Plan, Appendix C, page 30 line 21.

20 2024 Resource Adequacy Plan, Appendix C, page 30 lines 3 to 5.

21 2024 Resource Adequacy Plan, Appendix C, page 31 lines 11 to 12.

22 2024 Resource Adequacy Plan, Appendix B, Table 1.

23 2024 Resource Adequacy Plan, Appendix C, section 4.3.

24 2024 Resource Adequacy Plan, Appendix C, page 37 lines 5 to 13.

25 2024 Resource Adequacy Plan, Appendix C, page 37 lines 14 to 20.

26 2024 Resource Adequacy Plan, Appendix C, section 4.4.1.

27 2024 Resource Adequacy Plan, Appendix C, section 4.4.2.

- For potential new wind resources, NLH has assumed a capacity of 100 MW (made up of 24 4.26 MW turbines), that 75 percent of new wind will be off-Avalon and 25 percent on-Avalon, an ELCC of 22%, and a capacity factor of 40%.[28] Are these reasonable assumptions?

- For potential new solar resources, NLH has assumed a capacity of 20 MW, zero ELCC, a 20% capacity factor, and no locational characteristics.[29] Are these reasonable assumptions?

- For potential new battery energy storage systems ("BESS"):[30]

    - NLH assumes a 5-year lead time due to lead times for power transformers and circuit breakers.[31] Is this reasonable?

    - For short-duration batteries, NLH considered 20 MW and 50 MW options at a base case ELCC of 60% and high and low case ELCCs of 40% and 80%.[32] Is this reasonable?

    - For long-duration batteries, NLH considered 20 MW and 50 MW options with durations between 50 and 100 hours, and with only one option (Form Energy's iron-air battery) being identified as potentially cost-effective, NLH did not consider long-duration BESS as a solution.[33] Is this reasonable?

    - Should NLH study potential changes to hydroelectric generation schedules in existing dams as an alternative to long-duration battery storage?

- Regarding pumped storage:

    - Are any updates needed for the Hatch study addressing potential development of new pumped storage using existing infrastructure?[34] Why?

    - Should NLH perform a more in-depth economic comparison of short duration batteries and pumped storage?

    - Is NLH's plan to further study pumped storage options reasonable?[35]

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28 2024 Resource Adequacy Plan, Appendix C, section 4.5.

29 2024 Resource Adequacy Plan, Appendix C, section 4.7.

30 2024 Resource Adequacy Plan, Appendix C, section 4.6.

31 2024 Resource Adequacy Plan, Appendix C, page 45 lines 17 to 22.

32 2024 Resource Adequacy Plan, Appendix C, section 4.6.1.

33 2024 Resource Adequacy Plan, Appendix C, section 4.6.2.

34 2024 Resource Adequacy Plan, Appendix C, section 4.9.

35 2024 Resource Adequacy Plan, Appendix C, page 50 lines 6 to 10.

- NLH screened out as potential options combined-cycle combustion turbines[36] and small modular nuclear reactors.[37] While legislation currently prohibits nuclear, would nuclear be a viable option if there were no legislative prohibition? Was it reasonable to exclude these options?

- NLH did not include market purchases as a resource option.[38] Is that appropriate, or should these options be explored? Considering NLH's stated intention to "explore the availability of firm supply solutions,"[39] when could the results of such exploration be relevant for conducting revised resource analyses?

- NLH did not consider the potential extension of existing PPAs[40] (totaling 20 MW of firm capacity[41]) in its expansion plans. Was that reasonable?

- Has NLH reasonably captured available subsidies in its cost assumptions (e.g., tax credits)?[42]

- Regarding the cost estimates of the various supply resource options:[43]

    - Are the costs (capital, variable O&M, fixed O&M) reasonably captured?

    - Given Daymark's conclusions regarding the assumed capital costs for hydro (low compared to industry benchmarks)[44] and CTs, (high compared to industry benchmarks)[45] are any revisions or sensitivities needed?

    - NLH's cost estimates are AACE Class 5 estimates. Given that Class 5 estimates are associated with the lowest confidence level, is NLH's range (-50% to +100%) sufficient, or should the potential for higher cost overruns be tested?[46]

- Are there any other new supply resources considerations that should be addressed by NLH, beyond those considered in the RAP filing?

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36 2024 Resource Adequacy Plan, Appendix C, section 5.1.

37 2024 Resource Adequacy Plan, Appendix C, section 5.2.

38 2024 Resource Adequacy Plan, Appendix C, section 4.8.

39 2024 Resource Adequacy Plan, Appendix C, section 4.8.

40 2024 Resource Adequacy Plan, Appendix C, section 4.10.

41 2024 Resource Adequacy Plan, Appendix B, Table 9.

42 2024 Resource Adequacy Plan, Appendix C, page 24 lines 18 to 24.

43 2024 Resource Adequacy Plan, Appendix C, Attachment 1, page 2.

44 2024 Resource Adequacy Plan, Appendix C, Attachment 1, pages 9 to 10.

45 2024 Resource Adequacy Plan, Appendix C, Attachment 1, page 10.

46 2024 Resource Adequacy Plan, Appendix C, section 4.0.

Issue 5: Scenarios and Sensitivities

Regarding NLH's eight Expansion Plan scenarios:[47]

- Do the eight scenarios adequately cover a reasonable range of future scenarios for planning purposes?

- Does Scenario 4 reasonably capture the most conservative case (i.e., the lowest forecasted capacity and energy needs) for use in the Recommended Expansion Plan?

- Should full compliance with legislatively imposed decarbonization goals be a requirement of a Recommended Expansion Plan?

Regarding NLH's eleven Expansion Plan Sensitivities:[48]

- Sensitivity A forces the Expansion Model to include sufficient new wind resource to meet firm energy criteria and is carried through in every other scenario,[49] other than the "unrestricted" scenario. Is it reasonable to select wind as the sole technology option to provide firm energy?

- Some sensitivities (e.g., AC), remove the baseline assumption that a new CT will be required to burn off ten days of fuel storage each year.[50] Has NLH sufficiently explained the basis, costs, operational specifics, and alternatives for this assumption?

- Sensitivity AD attempts to capture the potential for cost overruns, including hydro[51] and CTs,[52] and higher than expected fuel costs.[53] Is the assumption that all hydro capital costs increase by 50% sufficient to do so?

- Some sensitivities limit the resources available to the Expansion Model, including sensitivities AE (which excludes BESS resources) and AEF (which limits CT additions to 150 MW or less). Are these important risks to consider and do the sensitivities reasonably capture those risks?

- Do the eleven scenarios adequately cover a reasonable range of futures for key variables for planning purposes? Should a scenario be completed that includes increases in both the capital cost and the fuel cost for a CT?

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47 2024 Resource Adequacy Plan, Appendix C, section 6.1.

48 2024 Resource Adequacy Plan, Appendix C, section 6.2.

49 2024 Resource Adequacy Plan, Appendix C, Table 5.

50 2024 Resource Adequacy Plan, Appendix C, section 6.2.1.1.6.

51 See sensitivity AD, 2024 Resource Adequacy Plan, Appendix C, Table 5.

52 See sensitivity AEH, 2024 Resource Adequacy Plan, Appendix C, Table 5.

53 See sensitivity AEG, 2024 Resource Adequacy Plan, Appendix C, Table 5.

Issue 6: Modeling Approach and Considerations

- NLH employed several models, including the Vista Model to produce its hydroelectric generation forecasts used in its Resource Planning Model,[54] the Reliability Model to determine planning reserve margins,[55] the Firm Energy model to assess firm energy needs,[56] the Resource Planning Model (i.e., the Expansion Model) to select resources,[57] the Transmission Model to determine any needed grid upgrades,[58] and the Long-Term Financial Model to determine the impact of investment on rates.[59] Are the models sufficiently understood and has NLH provided sufficient data to support the reasonableness of the assumptions and inputs used and the resulting outcomes?[60]

- For the Reference and Accelerated Decarbonization cases, NLH used a 14.7c/kWh customer rate, escalating at 2.25%/year, and for the Slow Decarbonization case, the same rate but escalated at 0.7%/year.[61] Were these reasonable assumptions?

- In running its Reliability Model, NLH selected a single representative year (2032) and applied the resulting planning reserve margins to the entire study period.[62] Was this a reasonable approach?

- Regarding forced outage rates:

    - For its existing thermal assets, NLH used a mix of historical derated adjusted forced outage rates ("DAFORs"), historical derated adjusted utilization forced outage probability ("DAUFOPs"), and equivalent forced outage rates ("EFORd") reported by NERC.[63] Was this a reasonable approach, and do historical data on NLH's assets[64] support this approach and set of assumed forced outage rates?

    - For Holyrood thermal generating station, NLH proposed to use DAUFOP as the metric and a value of 20% in the base case and a sensitivity of 34% for "near-term planning."[65]

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54 2024 Resource Adequacy Plan, Appendix B, page 14 lines 6 to 7.

55 2024 Resource Adequacy Plan, Appendix B, page 14 lines 8 to 10; see also 2024 Resource Adequacy Plan, Appendix B, section 5.1.

56 2024 Resource Adequacy Plan, Appendix B, page 15 line 1.

57 2024 Resource Adequacy Plan, Appendix B, page 15 lines 2 to 5.

58 2024 Resource Adequacy Plan, Appendix B, page 15 line 6.

59 2024 Resource Adequacy Plan, Appendix B, page 15 lines 7 to 8.

60 We recognize that in many cases, particularly in this Issue 5, written discovery will allow interested stakeholders to request and receive detailed modeling data, inputs, outputs, and other important information.

61 2024 Resource Adequacy Plan, Appendix B, section 4.1.

62 2024 Resource Adequacy Plan, Appendix B, page 19 lines 7 to 24.

63 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 3 lines 12 to 16.

64 See: http://pub.nl.ca/indexreportspages/12MonthRollingAverage.php.

65 2024 Resource Adequacy Plan, Appendix B, Attachment 1, section 4.0.

Is this a reasonable approach? And has NLH reasonably justified and explained the impact of the "near-term" sensitivity?

- For NLH's CTs, NLH used a mix of approaches to derive the DAUFOP values for use in the "near-term analysis" and Resource Planning Model.[66] Are these approaches and assumptions sufficiently explained, disclosed, and reasonable?

- For the LIL, NLH "calculated" an equivalent forced outage rate,[67] which measures the percentage of time that the LIL bipole is unable to deliver its Maximum Continuous Rating (currently 700 MW, but designed to be 900 MW) to the Island due to bipole forced outages, bipole derates, derates due to unplanned monopole outages, or derates due to overlapping monopole outages (effectively creating a bipole outage).[68] This results in a 5% base case assumption.[69] Was this a reasonable approach and does historical data observed so far support the assumptions (which is 2.34% based on a 700 MW rating and 3.56% based on a 900 MW rating)[70]? And how did NLH model outage of the LIL, e.g. was probabilistic outage used with different outage probability by season?

- For third-party resources, NLH used industry data (e.g., NERC GADS data) to determine DAFOR and DAUFOP, depending on the unit's generating characteristics,[71] and for hydro resources, used industry averages.[72] Were these reasonable?

- For its hydro units, NLH used a three-year capacity-weighted average DAFOR for the "near-term analysis," but a ten-year capacity-weighted average DAFOR for the Resource Planning Model.[73] Was this reasonable, and is sufficient data provided to demonstrate the reasonableness of the assumptions?

- For the Muskrat Falls project, NLH used historical forced outage rates observed to date for the near-term analysis, and for the Resource Planning Model, used forced outage rates of the NLH-owned hydro resources under the assumption that Muskrat Falls will be maintained to the same standards as the rest of the fleet.[74] Were these reasonable assumptions?

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66 2024 Resource Adequacy Plan, Appendix B, Attachment 1, section 5.0.

67 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 3 line 15.

68 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 6 line 22 to page 7 line 2.

69 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 6 lines 16 to 17.

70 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 7 lines 4 to 6.

71 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 3 lines 17 to 19.

72 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 6 lines 3 to 6.

73 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 5 lines 2 to 4.

74 2024 Resource Adequacy Plan, Appendix B, Attachment 1, page 5 line 13 to page 4 line 2.

- NLH indicates that it has "agreed to sell 1.7 TWh of energy banked in the Churchill River reservoir on behalf of Muskrat Falls."[75] Have the details and implications of this transaction been sufficiently explained?

- NLH modeled some hydro units' firm capacity (e.g., Bay d'Espoir) at their full nameplate capacity, while others were modeled at lower firm capacity values due to seasonal restrictions (i.e., icing impacts).[76] Run-of-river and small storage hydro units were modeled with daily energy limits that vary by month.[77] Are these reasonable assumptions for these units?

- NLH modeled Muskrat Falls at its full capacity year-round (i.e., no seasonal restrictions), with daily energy profiles that are simulated and vary by month.[78] Is this a reasonable approach?

- Existing thermal generators, with the exception of the Holyrood diesel-fired units, were modeled as firm capacity equal to their full nameplate capacity.[79] Is this a reasonable approach?

- Existing wind resources were modeled using 22% ELCCs, with separate wind profiles for the winter and non-winter seasons.[80] Is this a reasonable set of assumptions?

- Did NLH reasonably model potential imports,[81] including imports from Nova Scotia over the Maritime Link, from New Brunswick over the NB-NS intertie and Maritime Link, and ISO New England via the ISO New England-NB intertie, the NB-NS intertie, and the Maritime Link? Was it reasonable to not consider any new potential long-term firm import contracts as a resource option?

- Has NLH reasonably modeled contractually-obligated and surplus exports to Nova Scotia and surplus energy through Quebec?[82]

- Regarding modeling of the LIL, NLH noted its dependency on the Maritime Link and stated that due to this relationship, NLH developed an hourly capacity profile for the LIL that serves as a constraint on the LIL and that is based on the hourly IIS load profile and the firm contractual export commitments over the Maritime Link.[83] Has NLH provided

[75] 2024 Resource Adequacy Plan, Appendix C, page 22 lines 5 to 6.

[76] 2024 Resource Adequacy Plan, Appendix B, section 5.1.2.1.1.

[77] 2024 Resource Adequacy Plan, Appendix B, section 5.1.2.1.2.

[78] 2024 Resource Adequacy Plan, Appendix B, section 5.1.2.1.3.

[79] 2024 Resource Adequacy Plan, Appendix B, section 5.1.2.2.

[80] 2024 Resource Adequacy Plan, Appendix B, section 5.1.2.3.

[81] 2024 Resource Adequacy Plan, Appendix B, section 5.1.3.1.

[82] 2024 Resource Adequacy Plan, Appendix B, section 5.1.3.1.

[83] 2024 Resource Adequacy Plan, Appendix B, section 5.1.4.3.

sufficient data and information to assess this assumption? And is this a reasonable approach?

- NLH identifies a "Bridging Period" of sustaining existing thermal generation to maintain reliability while new generation capacity is being built.[84] Is this a reasonable approach, and if so, is the Bridging Period timeframe (2023-2030) supported? Should NLH consider a shorter Bridging Period and assess the cost impact of doing so (e.g., accelerating new capacity to 2029 (or earlier))?

- Has NLH conducted the firm energy modeling[85] in a reasonable manner, including resource capacity factors, import and export potential, LIL availability, and LIS resource availability?

Issue 7: Expansion Plan Results, Insights, and Next Steps

- In all cases, all existing thermal projects are retained until 2030, and no firm capacity additions are made prior to 2030. Is this a reasonable approach, or should NLH consider the impact of a pre-2030 asset retirement and new resource addition?

- NLH's "Minimum Investment Required Expansion Plan" does not meet all reliability requirements of the Reference Case, largely due to a lower assumed LIL forced outage rate.[86] NLH proposes that in addition to the minimum investment (as a "first step"), it will monitor load growth and other factors to determine if more investment is needed.[87] Is this reasonable, or should NLH be considering additional investment to meet the Reference Case scenarios?

- NLH states that it will "continue the advancement" of Bay d'Espoir Unit 8 and a 150 MW CT on Avalon (with synchronous condenser capability and the ability to run or be converted to alternative fuels), including "currently executing on FEED" studies on both projects.[88] What issues should be considered regarding NLH's plan, including the cost and risk of moving these projects forward prior to regulatory application (let alone approval), the potential for alternative solutions, and the potential for supplemental resource adequacy modeling that may alter the recommended portfolio?

- Regarding the FEED studies:

    - Will the FEED studies resolve questions regarding the referenced fuel burn-off requirement for the CT prior to NLH's application?

[84] 2024 Resource Adequacy Plan, Appendix B, section 5.1.6.

[85] 2024 Resource Adequacy Plan, Appendix B, section 5.3.

[86] 2024 Resource Adequacy Plan, Appendix C, section 8.1.

[87] 2024 Resource Adequacy Plan, Appendix C, section 8.1.

[88] 2024 Resource Adequacy Plan, Appendix C, section 9.3.

- What is the planned timeline for each FEED study?

- NLH appears to be moving toward an application where it will seek approval to develop and own assets with commercial operations dates in 2031.
  - Will NLH make such an application, seeking approval of a 2031 capacity addition?
  - What near-term commitments and/or expenditures does NLH plan with respect to the proposed CT?
  - What happens to any CT-related costs if load growth does not materialize over, say, the next 5 years?

- NLH identifies as next steps more refined cost estimates.[89] How should NLH manage risks associated with capital cost estimates (and potential overruns)? Should customers take that risk, or should NLH's cost estimates be binding (with pre-determined allowances)?

- NLH identifies several "ongoing" resource adequacy efforts alongside its recommended portfolio (for which it is already taking steps to implement). These include potential changes to BESS and wind ELCCs, enhanced ECDM offerings, and potential increased output from existing hydro units,[90] among others. How does NLH expect to manage the potential for material changes in the supply and demand landscape on its plans to pursue a portfolio of capacity and firm energy resources (and how should NLH do so)?

- To address firm energy needs, NLH proposes to pursue a wind expression of interest process. Is this a reasonable approach and what considerations should NLH address in designing the EOI process?

[89] 2024 Resource Adequacy Plan, Appendix C, section 9.3.3.

[90] 2024 Resource Adequacy Plan, Appendix C, section 10.0.