Nova Scotia Utility and Review Board

Mailing address
PO Box 1692, Unit "M"
Halifax, Nova Scotia
B3J 3S3
board@novascotia.ca
http://nsuarb.novascotia.ca

Office
3rd Floor, 1601 Lower Water Street
Halifax, Nova Scotia B3J 3P6
1 855 442-4448 (toll-free)
902 424-4448 t
902 424-3919 f

May 23, 2024

mark.peachey@nspower.ca

Mark Peachey, LL.B.
Manager, Capital Filings
Nova Scotia Power Inc.
1223 Lower Water Street
P.O. Box 910
Halifax, NS B3J 2W5

Dear Mr. Peachey:

M11307 - Evergreen IRP Updated Action Plan and Roadmap - 2023

On August 8, 2023, NS Power filed its 2023 Evergreen IRP – Updated Action Plan and Roadmap (Evergreen IRP Update).

The panel assigned to this matter is Roland A. Deveau, K.C., Vice Chair; Richard J. Melanson, LL.B., Member; and Steven M. Murphy, MBA, P.Eng, Member.

As noted by NS Power, the Evergreen IRP Update arises from a commitment made by the Utility in its 2020 IRP planning process. The context for the filing of the Evergreen IRP Update is important:

> The 2020 Integrated Resource Plan (IRP) process identified both Action Plan and Roadmap items intended to advance NS Power's long term electricity strategy. As part of the Roadmap, NS Power proposed an evergreen IRP process, which allows for the refinement of the Action Plan and Roadmap in alignment with planning environment changes. The changes in environmental policy, load, and resource assumptions since the 2020 IRP indicated it would be appropriate for NS Power to revise the long-term electricity strategy in alignment with Nova Scotia's 2030 environmental targets and beyond. The results of this work, in addition to the extensive stakeholder engagement process and ongoing consultation, demonstrates NS Power's commitment to ensure that its long-term strategy is in alignment with significant policy and market changes and supports the progression towards a decarbonized future.

> The evergreen IRP process included updates to the assumptions and new modeling scenarios to reflect significant changes since the 2020 IRP and corresponding modeling work to support the assessment of these changes.
>
> The twenty-four scenarios assessed as part of the evergreen IRP capture a broad range of potential planning environment outcomes. The final modeling results, which can be found here, provide NS Power with a range of potential system planning outcomes. The common elements amongst the scenarios signal to NS Power key areas of focus for our long-term electricity strategy and inform tangible Action Items to meet our 2030 targets and beyond.
>
> [NS Power Reply Submission, October 17, 2023, pp. 1-2]

By letter dated August 31, 2023, the Board set out a timeline for the receipt of submissions from participants about NS Power's analysis in the Evergreen IRP Update. Board Counsel consultants Synapse and Bates White provided submissions on September 8, 2023. On September 26, 2023, submissions were received from Grid Strategies (on behalf of the Consumer Advocate); the Small Business Advocate; EfficiencyOne (E1); Eastward Energy; Port Hawkesbury Paper (PHP) and the Nova Scotia Department of Natural Resources and Renewables (NRR). NS Power filed its reply submission on October 17, 2023. On November 27, 2023, NS Power filed a corrected version of the Appendix A to its reply submission to reflect comments it had inadvertently omitted from its prior reply submissions.

On December 8, 2023, NS Power wrote to the Board and participants stating that it had completed, and were filing, two studies in its ongoing work as part of the Action Plan and Roadmap:

- Action Plan Item 2a: Electrification Strategy - Publish Electrification Strategy report, developed as part of the IRP Action Plan, in 2023 with opportunity for stakeholder review and comment.

- Roadmap Item 1: Wind Integration Studies - Publish the results of the ongoing wind integration studies in 2023. Provide guidance on integration asset requirements as an outcome in alignment with the planned variable renewable capacity additions. Continue to monitor results for significant divergence from wind integration assumptions modeled in the evergreen IRP and trigger an update as needed.

NS Power held a technical conference on February 2, 2024, to discuss stakeholder questions on both the Electrification Strategy Report and the Wind Integration Study. At the request of the Board, NS Power filed copies of the technical conference presentations on March 7, 2024.

In its reply submission, the Utility addressed various issues raised by the Board Counsel consultants and intervenors, including:

- NS Power responded to many submissions that recommended the Utility pursue alternative plans if the Atlantic Loop is not feasible, to ensure 2030 decarbonization targets are met. NS Power noted that its central planning case is consistent with Evergreen IRP scenario CE1-E1-R2, which does not include the Atlantic Loop. NS Power said it will continue to participate in discussions on opportunities for regional integration and will adjust the long-term resource plan if required, as any opportunities evolve. It asserted this is consistent with Action Plan Item 1b.

- The Consumer Advocate and Small Business Advocate noted the need to assess future hydrogen development (load, generation) in Nova Scotia and the need for tariff development to support hydrogen production. NS Power noted that hydrogen project specific work and tariff development are initiatives completed outside the Evergreen IRP process. However, as this work progresses separately with stakeholders, it would tie back to the Evergreen IRP process through specific Roadmap items (Items 3, 8 and 11).

- Synapse, E1 and NRR recommended additional study to evaluate the additional effective load carrying capacity (ELCC) diversity benefit of having combinations of battery, wind, solar and demand response resources on the system concurrently. In the 2019 Planning Reserve Margin and Capacity Value Study (Capacity Study), which informed the 2020 IRP, the ELCC diversity benefit of wind + storage was incorporated into the Evergreen IRP model. For example, in scenario CE1-E1-R2 a diversity benefit of 4.8 MW is credited in the resource plan in 2030, reflecting the pairing credit of 140MW of four-hour energy storage with the incremental wind build of 1,497MW. Wind was the primary variable renewable resource added in both the initial insights and draft modeling results phases of the Evergreen IRP, with very little grid-connected solar seen in any resource plans at those stages of the process. In the Final Modeling Results, many resource plans (including CE1-E1-R2) incorporate approximately 200MW of grid-connected solar by 2030. This change is likely driven in part by the addition of the federal Investment Tax Credits between the draft and final results. While modeling suggests that the diversity credit could increase to about 18MW if 140MW of four-hour storage is paired with 200MW of solar (or to 38 MW, if four-hour storage is paired with 300MW of solar), NS Power is concerned this would potentially amount to "double counting" of wind + storage and solar + storage diversity credits, and may result in "over-crediting" the diversity benefit, since the same capacity of installed four-hour storage would be paired with wind and solar simultaneously.

  Synapse, E1 and NRR recommended expanding the Capacity Study to include the evaluation of the incremental diversity benefit from increased interaction among these resources (i.e., solar + wind + battery + demand response) to determine the potential to offset a portion of required new firm capacity resources. NS Power stated it will investigate avenues for completing this work prior to the next IRP analysis. However, noting there is an average requirement of approximately 600MW of new fast acting generation capacity by 2032 in No Atlantic Loop Evergreen IRP scenarios, it said further study is not necessary prior to proceeding with the first addition of 300MW of new fast acting generation with an in-service target of 2027 identified in the 2030 Resource Development Plan. NS Power's suggested approach was supported by PHP and Eastward Energy because the diversity benefit would not be large enough to displace the need for new firm, fast-acting generation, and further study might jeopardize the timely addition of adequate capacity to accommodate the integration of variable renewable generation.

- NS Power also addressed concerns about its pace to address 2030 decarbonization targets, including phasing out coal-fired generation and attaining 80% of renewables on the system. The Utility submitted that its Evergreen IRP process, incorporating its Action Plan and Roadmap, addresses the key tasks that must be undertaken to achieve the 2030 targets. It noted it intended to file a detailed report about its capital investment plan by December 31, 2023, as directed by the Board. NS Power filed this plan entitled "Path to 2030" on December 22, 2023. On January 2, 2024, the Board made this document an exhibit in the 2024 ACE Plan proceeding.

- NS Power addressed a recommendation by Bates White and Grid Strategies for all source RFP processes to acquire generation and infrastructure assets required to meet 2030 decarbonization targets. The Utility acknowledged that "multiple and robust procurement processes" are needed to implement the IRP Action Plan, some of which it expects will be prescribed and administered by the Province. It committed to working with the Province on project-specific processes and noted any capital investments would be subject to Board review and approval.

- The Consumer Advocate, E1 and Eastward Energy supported continued study about the value of the Hybrid Peak Mitigation electrification profile, particularly about the potential costs of this strategy. While NS Power noted that future assessment of the strategy is included in Action Plan Item 4b, the Utility stated the study should be led by an external 3rd party to coordinate a multi-stakeholder study process.

- NS Power acknowledged the urgency noted by Synapse, PHP and NRR of progressing with the Reliability Tie project given its importance to the key findings of the Evergreen IRP Update.

- Consistent with comments by PHP and NRR, NS Power also acknowledged the importance of continued participation in the consultation process about the pending federal *Clean Electricity Regulations* being undertaken by Environment and Climate Change Canada.

ANALYSIS AND FINDINGS

NS Power must meet important environmental targets by 2030, which include phase-out of coal-fired generation and achieving 80% of its sales from renewable resources. The successful execution of the Evergreen IRP Updated Action Plan and Roadmap is integral to meeting these goals.

The intervenors were generally supportive of NS Power's efforts in developing the Evergreen IRP Update and were satisfied that most of the key issues had been addressed, including many concerns remaining after the 2020 IRP. The Evergreen IRP process was described by intervenors as transparent, thorough, and informative. The Small Business Advocate supported the Evergreen IRP process as an "improvement in NSPI's long-term planning processes". The Board is satisfied that NS Power's Evergreen process has been a successful exercise.

However, the integrated resource planning environment is not static. The policy backdrop continues to evolve, and the technological advances have presented both opportunities and challenges. The Board considers that the Evergreen IRP must also continue to evolve with the changing environment.

There have also been important developments since the Evergreen IRP Update was filed. First, the Province released Nova Scotia's 2030 Clean Power Plan on October 11, 2023. Second, the development of the federal *Clean Electricity Regulations* continues. On February 16, 2024, Environment and Climate Change Canada released its most recent update of the *Regulations*. A further feedback period ended March 15, 2024. Further, on December 22, 2023, NS Power filed its "Path to 2030" plan, which was subsequently made part of the 2024 ACE Plan proceeding, describing how the Utility will meet its 2030 decarbonization targets.

Finally, on April 5, 2024, the Legislature passed the *Energy Reform (2024) Act*. While the *Act* is not yet proclaimed, it establishes a new Nova Scotia Independent Energy System Operator (IESO). Notably, the new IESO will assume the integrated resource planning process from NS Power. The proclamation of the *Act*, and the IESO taking effect, is expected at some point in 2025.

The Board accepts the Evergreen IRP Update, as filed. However, it does provide direction to NS Power on several points for the next Evergreen IRP Update.

As noted by Synapse in its August 2023 comments, the battery energy storage ELCC profile is a critical input value to the modeling. This needs to be carefully re-examined in conjunction with an updated portfolio ELCC analysis, which considers the interactive effect of all four clean resources (i.e., wind, solar PV, battery energy storage, and demand response or peak load mitigation during winter peak periods). The Board sees value in further study to evaluate the incremental diversity benefit available from increased interaction among renewable resources.

Synapse also recommended ongoing study under the hybrid peak mitigation scenario, and an updated analysis of battery energy storage capacity, prior to any significant commitment regarding 2029 or 2030 CT additions. This work needs to proceed.

The Board finds that it is imperative for NS Power's Evergreen IRP process to continue. The timeline to 2030 is relatively short, especially considering the significant capital projects that will be required to meet the 2030 targets. It is also important that NS Power continue to engage with federal and provincial government agencies to monitor and implement policy developments.

Further, NS Power must not delay or defer any part of the Evergreen IRP process in anticipation that the IRP responsibilities will be assumed by the new IESO at some point in the future. Given the impending 2030 deadline, it is essential that the Evergreen IRP process continue uninterrupted, and the Evergreen IRP Updated Action Plan and Roadmap be diligently executed.

The Board directs NS Power to file its next Evergreen IRP Update no later than January 31, 2025.

Yours truly,

Roland A. Deveau, K.C.
Vice Chair

Richard J. Melanson, LL.B.
Member

Steven M. Murphy, MBA, P.Eng.
Member

c: William L. Mahody, K.C.
Participants M10504