

April 29, 2022

Crystal Henwood
Regulatory Affairs Officer/Clerk Nova Scotia Utility and Review Board
1601 Lower Water Street, 3rd Floor
P.O. Box 1692, Unit "M"
Halifax, NS B3J 3S3

Dear Ms. Henwood:

Re: M10504 - IRP Action Plan (P-884)

On April 6, 2022, Nova Scotia Power Incorporated (NS Power, Company) held an engagement session with stakeholders to review the Company's 2020 Integrated Resource Plan (IRP) Action Plan Report and proposed evergreen Study Scope. NS Power requested stakeholders to provide comments on the Study Scope by April 15, 2022.

On April 7, 2022, the Nova Scotia Utility and Review Board (NSUARB, Board) directed NS Power as follows:

The Board directs NS Power to file its draft 2022 Study Scope for the Board's review no later than Friday, April 29, 2022, together with a summary of the stakeholder comments along with NS Power's responses and activity schedule, with specific action dates.

NS Power received comments from interested parties on the evergreen Study Scope, copies of which are provided as Attachment 1. In accordance with the NSUARB's direction, a matrix with NS Power's responses to the comments received from stakeholders is also provided as Attachment 2.

The comments received on the evergreen Study Scope reflect several general themes. Below is a summary of the comments received and the Company's responses.

1. Comments or Questions related to Scenarios, Assumptions, and Sensitivities and how they may be revised

The evergreen modeling will focus on scenarios and assumptions where there has been a significant change since completion of the 2020 IRP. In NS Power's responses, it has provided its initial views on the approach to the specific assumptions that have been commented on/inquired about; however, NS Power's Study Scope proposes to engage with interested parties on these items before finalizing these items through the provision of draft assumptions and scenarios for stakeholder review and comment.

2. Comments or Questions related to Engagement Process and Timelines for Completion of Evergreen Modeling

Comments in relation to these themes were focused on process; certain parties want to see stakeholder workshops structured, requests for materials in advance of workshops, seeking confirmation of sufficient time for stakeholder comments on materials circulated by NS Power within the overall process. NS Power has reflected comments on process related items for stakeholder engagement in its updated Study Scope.

3. Comments or Questions related to Evergreen Update Deliverables

The primary focus of the evergreen update is to understand how significant changes in the planning environment or assumptions may affect the IRP Action Plan and Roadmap items. This will be a focused exercise to understand and reflect changes that may affect the strategic direction established by the IRP.

4. Clarifications relating to Action Plan and Roadmap Update Items

NS Power has provided responses to those specific requests for clarification in Attachment 2.

Also provided as Attachment 3 is a revised draft of the Company's evergreen Study Scope, which has been updated from the version presented at the stakeholder session on April 6, 2022 to reflect comments received from stakeholders.

A detailed activity schedule related to the evergreen Study Scope has been included in the draft Company's evergreen Study Scope (please see Attachment 3, slide 7 for the detailed activity schedule).

All correspondence in relation to this matter should be directed to my attention.

Yours truly,

A handwritten signature in black ink, appearing to read "Brian Curry". The signature is stylized with a large, looping "B" and a cursive "Curry".

Brian Curry,
Director Regulatory Affairs

c.
Interested Parties (M10504)



Nicole Godbout
Director of Regulatory Affairs
Nova Scotia Power Inc

Delivered via email to nicole.godbout@nspower.ca

14 April 2022

Re: Letter of Comment Regarding IRP's Draft Findings, Action Plan and Roadmap

Dear Ms. Godbout,

On April 6, 2022, representatives of AREA and the Berwick Electric Commission, the Riverport Electric Light Commission, the Town of Antigonish, and the Town of Mahone Bay ("AREA and the MEUs") participated in NS Power's IRP Action Plan Update session. As part of that session, NS Power asked for comments on Study Scope and Process Timelines by April 15, 2022. AREA and the MEUs have the following comments:

1. Scope of Evergreen IRP 2022 Update – Assumptions

AREA and the MEUs agree that changes have occurred since 2020 that warrant significant modeling updates. On Slide 2 of the 2022 Evergreen IRP Study Scope, NS Power states that the "evergreen work will be informed by updates to the assumptions and scenarios/modelling plan based on significant changes observed post the 2020 IRP." Obviously, the evergreen work will only be useful to the extent that the updated assumptions are vetted by stakeholders and reflect the most current and accurate information. The proposed scope and timeline need to ensure that there is significant opportunity for stakeholders to have input into (and fully understand the basis for) the assumptions and proposed scenarios before such assumptions are finalized and prior to the start of the modeling exercise. For example, AREA and the MEUs believe, at a minimum, the following questions need to be fully addressed and discussed as part of the finalization of the assumptions for the Evergreen Update:

- How will GHG compliance costs beyond 2022 be modeled? What are the range of reasonable options/alternatives?
- What technical options are available to meet a potential 2035 Net Zero 2035 Electricity System Target and how will this potential new policy requirement impact the modeling exercise?
- What specific commercial discussions have taken place for near term firm import capacity opportunities by winter 2023/24, what remains to be done to achieve firm capacity over the





NS/NB interface by that date, and what are the appropriate long-term forecast assumptions for available firm import capacity for the Study Period?

- What is the current status of TSR 411 and the Reliability Tie Development, and what would be required to determine a more precise target in-service date than “2025-2029 (or earlier if practical and feasible)” for modeling purposes?
- What are NS Power’s future plans with respect to TSR 412, why was it withdrawn, and what additional analysis/engineering work is required to develop assumptions about the costs and benefits of increasing the size of the existing interconnection with NL?
- How does NS Power propose to model the potential Regional Integration Alternatives associated with the Atlantic Loop and/or imports from the New England market based on updated information, and what are the basis for those assumptions?
- What are NS Power’s updated assumptions associated with Battery Energy Storage Systems?
- In advance of the completion of ongoing wind integration studies, what assumptions is NS Power making with respect to (1) additional interconnection infrastructure costs and (2) expected levels of overall wind curtailment associated with both the Nova Scotia Rate Base Procurement and any other new wind that may be modeled during the Study Period?
- What are NS Power’s updated assumptions associated with Coal Unit Conversions and new Combustion Turbines?

In providing stakeholders with updates on the modeling assumptions in relation to these issues, NS Power should be required to provide stakeholders with concrete and specific information in a regular and timely way as and when new developments occur that would change the assumptions.

2. Scope of Evergreen IRP 2022 Update – Timelines

On Slide 7 of the Evergreen IRP 2022 Study Scope, NS Power sets out generic “Process Timelines” for the upcoming process element stages of the update, indicating only that assumptions and modeling scenarios will be finalized in Q2, draft modeling results shared with stakeholders in Q3, and modeling and analysis will be completed in Q4. AREA and the MEUs request that specific dates be established to hold NS Power accountable in meeting firm deadlines, and so that stakeholders are informed long in advance of the expected approximate dates for workshops. Setting a formal schedule will also ensure that stakeholders are provided sufficient opportunity to provide written comments following receipt of information and their participation in workshops. There is a significant amount of work to be done with respect to





the Evergreen IRP 2022 Update, and without firm deadlines, there is a risk that the IRP work will be delayed further as a result of the GRA and/or future NS Power capital applications.

3. Need for More Stakeholder Engagement in Future IRP Workshops

NS Power initially circulated its IRP Action Plan Update to stakeholders on January 21, 2022. The stakeholder workshop did not occur until April 6, 2022, and unfortunately the majority of the session involved NS Power simply reiterating the comments from its slides, which significantly limited the opportunity for stakeholder questions, comments, and interaction. As a general comment, for all future IRP workshops as part of the Evergreen IRP 2022 Update, NS Power should assume that parties are familiar with the materials provided in advance and come to the workshops prepared to engage directly and productively with stakeholders.

Thank you for the opportunity to submit these comments.

Kind regards,

Aaron Long
General Manager
aaron.long@municipalenergy.ca
902.497.1447



Resource Insight Inc.
MEMORANDUM

To: Bill Mahody, Q.C., Consumer Advocate
From: Paul Chernick and John D. Wilson
Date: April 18, 2022
Subject: Evergreen IRP Study Scope and Timeline

NS Power's IRP Action Plan Update submitted in January 2022 and updated for the April 2022 stakeholder webinar supplied a solid overview of the issues and topics that require attention in the 2022 update to NS Power's IRP. This memo generally considers the approaches that NS Power laid out in the April 2022 update.

Planning Environment Changes

There are a few points where we were not perfectly clear about NS Power's intentions regarding the changes in the planning environment.

- a) NS Rate Base Procurement: We assume that NS Power will include this as an existing resource commitment in all scenarios and sensitivities. We understand that NS Power will not have certainty regarding the resource locations and capacities and will need to make some reasonable assumptions.
- b) Mersey Redevelopment: We assume that NS Power will evaluate this project using the latest costs and considering the considerable uncertainty regarding whether it will be approved.
- c) Maritime Link and Labrador Island Link reliability: Consistent with the Board's recognition of Mr. Trim's evidence in the Final Assessment suggesting that the reliability of the Maritime Link will be less than 98%, NS Power should re-evaluate the ELCC of resources delivered via the Maritime Link. The reliability of the Labrador Island Link should also be re-evaluated given continuing issues with the operating deliveries.

We also understand that NS Power has already updated its modeling of wind resources to allow for curtailments or other mitigation actions to address system stability issues (rather than capping wind resources at 100 MW). We further understand that while system stability and related analyses will not be fully complete in 2022, some early findings will inform ECEI applications and should also be reflected in IRP modeling to the extent feasible.

Reliability Tie Considerations

We recommend that the base case for the IRP include significant schedule contingency for the Reliability Tie construction schedule. Normally, there would be some “known unknowns” contingency built into the planning schedule; reflecting the process and technical complexity of working with New Brunswick Power on lengthy new transmission lines, we strongly encourage NS Power to include contingency for “unknown unknowns” in its schedule (and cost estimate, for that matter). Such an allowance would allow for planning consideration of the risks of working with a partner, similar to the issues that emerged in working with Nalcor to achieve timely delivery of the NS Block.

Among other factors, NS Power should explicitly consider how long the current supply-chain constraints will continue, and how much they might affect the 4½-year lead time for the Reliability Tie.

Including additional schedule and cost contingency in the IRP may result in different information being used than in the subsequent submittal application, and the reasons for the different information can be appropriately explained in each product. The plan(s) developed in the IRP process should be robust to accommodate substantial delays (and cost increases) in this project, given its early stage of development and multiple complexities. On-time, on-budget delivery could be treated as sensitivity case.

Opportunities from Dispatch Improvements

While the details of any procurement of IT systems recommended in Concentric’s Dispatch Study are outside the scope of the IRP, the IRP planning team should coordinate with the market and operations team to determine how to reflect the benefits of such IT systems in the long-term planning environment. Ideally, a side case could be run to determine the order-of-magnitude system benefits from acquiring such a system. (There may be other benefits that are not well captured in the IRP modeling process.)

As noted on p. 58 of the Dispatch Study, “As emphasized in the general observations at the beginning of this report, when Nova Scotia Power’s energy dispatch is being evaluated, this needs to be done in terms of the entire portfolio and the assets’ contribution to ancillary products. This means that a conclusion regarding the energy output of one generator based on the heat rate logic alone will yield a very different perspective if the output of the facility is judged with respect to its contribution to the entire portfolio of assets and portfolio of products.” While the dispatch algorithm in long-term planning models is simplified compared to market and operational dispatch models, any information on the effects of improved market and operational dispatch should be reflected in

future updates to heat rate and purchased-power assumptions in the long-term planning model.

On a potentially related issue, we understand that Wreck Cove is the only hydro unit with AGC capability. Since most of the other hydro units will continue to operate for the foreseeable future, it would be helpful if those hydro generators could provide at least a limited amount of AGC. If NS Power can identify potential from such technologies, that could result in lower requirements for additional resources that provide ancillary services, either from smart inverters or from spinning machinery (synchronous condensers or generators).

Timeline

NS Power's proposed process and schedule for major revisions to the IRP are reasonable, and we have no suggested changes.

However, the scope of recent regulatory, procurement, and other changes make it imperative that NS Power re-confirm the suitability of major projects currently anticipated for subsequent submittal in 2022 using the IRP process. We are most concerned about the mix of generation and storage resources that may be evaluated too independently of one another, specifically the initial coal-to-gas conversion, wind additions beyond the NS Rate Base Procurement, battery storage, combustion turbine, and Mersey Redevelopment.

Using the 2020 IRP Scenario 2.1c as a baseline for evaluation of these projects in the EAM on a project-by-project basis is a significant risk given the substantial changes, most notably the NS Rate Base Procurement and updated federal and provincial policies.

We suggest the following process to run as an expedited, simplified process building off the early activities identified in NS Power's presentation.

1. **Refresh input assumptions on an expedited schedule.** We understand that finalizing some inputs may require more complex steps and be sensitive to stakeholder input. If those modifications are likely to be relatively inconsequential for the evaluation of subsequent submittal issues, preliminary updates could be used. Such inputs might include the electrification strategy, details on the NS Rate Base Procurement, etc.
2. **Conduct modeling based on a single scenario.** Re-optimization of the capacity plan and demonstration of project cost effectiveness, particularly with respect to generation resources, should be conducted, without including IRP modeling sensitivities. In order to expedite the findings, a preliminary base case could be used, such as:

- a. **Clean Energy Policy:** Net Zero 2050
 - b. **Electrification:** Current Policy, trended to the end of the IRP period
 - c. **Resource Strategy:** Limited expansion of new firm imports
3. **Review preliminary assumptions and modeling results with stakeholders.** A single stakeholder review and comment opportunity would be sufficient.
 4. **Finalize assumptions for the expedited study and complete base-case modeling.**
 5. **Conduct sensitivity analyses.** If NS Power models the effect of adding or omitting each major potential generation resource, it will be able to use the resulting avoided costs in the EAMs for its subsequent ACE submittals.

While we understand that dedicating planning team resources to this “branch” of the proposed scope and timeline may slow down the Evergreen IRP refresh during the early months, the learnings from this process may expedite later stages of the process. More importantly, absent NS Power conducting an all-source procurement, updated model findings will confirm the timing and scale of generation / storage resource investments given the material changes to the planning environment since 2020.

Clarifications from the Action Plan Presentation

1. **Renewable to Retail.** The presentation indicated that there was some RtR activity over the last year. Can NS Power share any information regarding that activity?
2. **Near-Term Firm Imports.** The presentation indicated that firm imports might be available for W 2023/24, even though even the Reliability Tie would not be available until at least 2026. Can NS Power share any information on the potential source and delivery path?
3. **TSR 411:** The presentation indicated that the transmission analysis is nearly complete. NS Power should update the parties as soon as feasible about the status of contracting for the import, including capacity, source and other characteristics.
4. **TSR 412:** While this TSR has been withdrawn, understanding the potential for purchases from or through Newfoundland is important. Is additional transmission capacity available in Newfoundland? Would any upgrades be needed in Nova Scotia to accommodate the import? Is there uncommitted

capacity on the Maritime Link? Are there sources of firm supply from Newfoundland or HQ, once the LIL is operating as designed?

1 Introduction

On January 21, 2022, NS Power filed its Integrated Resource Plan (IRP) Action Plan Update. On April 6, 2022, NS Power held a stakeholder engagement session on the IRP Action Plan Update and provided a high-level overview of its 2022 IRP Evergreen activities and timeline. NS Power requested stakeholder feedback on Evergreen Study Scope and Timeline by April 15, 2022.

EfficiencyOne (E1) appreciates the opportunity to provide comments on NS Power’s 2022 IRP Evergreen Study Scope and Timeline and respectfully submits the following comments.

1. Planning Environment Changes

Slide two of NS Power’s Evergreen IRP 2022 Scope and Timeline identifies several significant environmental policy changes that have occurred since the completion of NS Power’s IRP in November 2020. These include:

- The amendment of Renewable Electricity Regulations to now include a renewable electricity standard for 2030 which specifies 80 percent production from renewable sources by 2030, with 1100 GWh from independent power producers.
- The introduction of the *Environmental Goals and Climate Change Reduction Act* (EGCCRA). This act, among other things, mandates the phase-out of coal-fired electricity in Nova Scotia by 2030 and prescribes that Provincial GHG regulations possess targets of 53% below 2005 levels in 2030, and by 2050 to be net zero.¹
- The federal government has provided updated guidance associated with the carbon pricing system in place after 2022. Nova Scotia has not yet released updated guidance associated with this direction.
- The release of a draft discussion paper “A clean electricity standard in support of a net-zero electricity sector” which references a net-zero electricity sector by 2035.²

¹ Environmental Goals and Climate Change Reduction Act, SNS 2021, c.20

²<https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/achieving-net-zero-emissions-electricity-generation-discussion-paper.html>

Given planning-level changes noted above, E1 supports the remodeling of IRP scenarios and the development of additional scenarios as appropriate. E1 offers the following comments on NS Power’s Evergreen IRP 2022 Scope and Timeline.

2. Process and Deliverables

E1 requests that the Study Scope include the following deliverables as part of the Evergreen IRP process:

- Evergreen IRP 2022 Reference Plan;
- Updated avoided costs of DSM using the aforementioned 2022 Reference Plan; and
- Fulsome stakeholder engagement process for the development of updated avoided costs of DSM.

Reference Plan

Selection of a Reference Plan is required for the development of Avoided Costs due to DSM, which are required for DSM planning and monitoring of rate and bill impacts due to DSM. E1 recommends the Evergreen process include the selection of a Reference Plan and that the evaluation used for selection be transparent and explicit in relation to the metrics used.

Avoided Costs

Avoided costs of DSM (energy, capacity, transmission, distribution and carbon) continue to be an important input to DSM planning and analysis activities. E1 recommends that the Evergreen process include the development of updated avoided costs of DSM. E1 further requests a fulsome stakeholder engagement process is used for the development of the updated avoided costs. There has been significant discussion surrounding the current avoided costs of DSM and E1 believes that any update would benefit from meaningful stakeholder engagement during the development of these avoided costs. This stakeholder forum would also provide an opportunity to update Transmission and Distribution avoided costs as well, which have not yet been updated for 2022.

Comment Periods

E1 appreciates the inclusion of stakeholder comment periods for each of the four Process Elements included on slide 5 of the Evergreen Study Scope slide deck. To ensure meaningful feedback is provided throughout this process E1 recommends that a minimum of two weeks is provided to stakeholders for all comment periods. Further, E1 notes that information such as reports and analyses which will be used to inform updates to assumptions and inputs in the 2022 Evergreen process (an example from the 2020 IRP would be E3's Pathways Study), should be provided to stakeholders in advance for review and comment at times in the process that allow for meaningful consideration of stakeholder feedback.

3. Preliminary Drivers and Sensitivities

Clean Energy Policy

E1 understands that NS Power has included Net Zero 2035 as an emissions trajectory for scenario development in the Evergreen process. E1 recommends that the 2022 Evergreen Study Scope focus on analyzing scenarios with this emissions trajectory.

Treatment of Carbon Pricing

E1 believes the effects of carbon pricing remain relevant in the context of the 2022 Evergreen IRP Process. In the IRP Action Plan update, NS Power states:

NS Power is currently modeling multiple options for GHG compliance beyond 2022, including the federal Output Based Pricing System (OPBS) and a revised hard cap trajectory similar to those used in the 2020 Integrated Resource Plan.³

Neither of the options listed by NS Power directly note the inclusion of a federal backstop carbon price, although the latter option described is ambiguous with respect to the application of a carbon price for any additional emissions reduction below any hard cap. The scope of the

³ NS Power IRP Action Plan Update, January 21, 2022, at Slide 8.

Evergreen process should facilitate the inclusion of a diverse set of carbon pricing options, or at minimum allow for stakeholder input and discussion with regard to the selection in the carbon pricing trajectory for the 2022 Evergreen IRP Process.

Resource Strategy

Demand Response (DR) can be a valuable source of firm capacity in NS. E1 recommends that NS Power treat winter peak demand savings from DR as firm peak demand reductions within the context of the Evergreen IRP Process.

Electrification

To the extent that the current draft electrification strategy contemplates ratepayer investment, the associated costs should be reflected in the 2022 Evergreen IRP modelling scope. This will allow for determination of the potential effects on partial revenue requirement in the context of Evergreen IRP modelling. Any such costs inputs should be subject to fulsome stakeholder engagement and consultation.

Finally, NS Power should consider the variability of differing electrification scenarios with respect to the amount of Transmission & Distribution (T&D) costs included in each scenario. Differing net system requirements and expected peak demand events between electrification scenarios are likely to form differing requirements for T&D.

2022 Load Forecast

E1's understanding is that the 2022 NS Power Load Forecast deviates significantly from the 2019 Load Forecast which was used in the 2020 IRP. E1 recommends that the scope of the Evergreen 2022 update will include incorporation of the 2022 NS Power Load Forecast.

Sensitivities

Consistent with the 2020 IRP approach, E1 recommends that the 2019 DSM Potential Study scenarios (Low, Base, Mid, Max) be included as a sensitivity within the 2022 Evergreen Study

1 Scope. E1 further recommends that all DSM scenarios from the 2019 Potential Study be paired
2 with each of the scenarios explored within the Scope of the 2022 Evergreen process. This will
3 provide a more fulsome exploration of DSM, which is important recognizing that the primary
4 drivers for this IRP modelling update is more stringent environmental policy and accelerated
5 electrification loads. E1 further recommends that there should be continued emphasis in the
6 2022 Evergreen scope on sensitivities that explore limitations on available regional integration
7 to reflect continued risk.

8
9 **4. Process Timelines**

10 Schedule of Activities

11 In addition to the high-level timeline provided on slide 7 of the Study Scope of Timeline deck, E1
12 notes that a more detailed tentative schedule of activities would be assistive for planning
13 purposes.

14
15 **Closing**

16 E1 thanks NS Power for the opportunity to comment on the draft Evergreen IRP 2022 Scope and
17 Timeline and looks forward to continued work with NS Power and stakeholders.



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Our File: 179164
April 14, 2022

Ms. Nicole Godbout
Director, Regulatory Affairs
Nova Scotia Power
1223 Lower Water Street
Halifax, NS B3J 3S8

Dear Ms. Godbout:

Re: 2022 Evergreen IRP Study Scope and Timeline

On April 6, 2022, Nova Scotia Power Inc. ("NSPI") presented its IRP Action Plan Update and 2022 Evergreen IRP Study Proposed Scope and Timeline to stakeholders. Please accept the following brief comments on behalf of Port Hawkesbury Paper LP ("PHP").

PHP is generally supportive of the draft Evergreen IRP Study Scope and Timeline, as PHP agrees that modeling updates are warranted given the significant developments that have occurred since the IRP modeling exercise was last conducted in 2020. That being said, PHP notes NSPI's proposed process timelines do not contain any specific dates as of yet. Instead, the following high-level milestones are noted at Slide 7:

- Assumptions and Modeling Scenarios Finalized – Q2 2022
- Draft Modeling Results Shared with Stakeholders – Q3 2022
- Complete Modeling and Analysis – Q4 2022
- Update IRP Action Plan and Roadmap, if appropriate – End of 2022

PHP believes that all parties would be better served if NSPI's Study Scope and Timeline includes a specific schedule with firm dates. This form of schedule would provide clarity regarding the process for stakeholder review, workshop discussion, and written comment, and help ensure that there are no further delays beyond the end of 2022.

For example, significant questions remain with respect to the status of recent developments that have occurred since the 2020 IRP was completed, and how these will impact the assumptions and modeling scenarios to be finalized by the end of Q2. PHP remains unclear from NSPI's IRP Action Plan presentation as to the status of a number of items that will need to be specifically modeled as part of the Evergreen IRP update, including (but not limited to) evolving GHG emission and net zero electricity policies, the status and availability of firm import

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capacity opportunities beginning in Winter 2023/24, the expected in-service date and updated cost assumptions associated with the Reliability Tie, how to properly model available Regional Integration Alternatives such as the Atlantic Loop, updated cost and curtailment analysis for the integration of new wind resources, the latest assumptions on coal-to-gas conversions, storage, and combustion turbines, etc. There is clearly a significant amount of information that needs to be presented to stakeholders for review, discussion, and comment before the assumptions and modeling scenarios can be finalized. The end of Q2 in June is now only 2.5 months away, so it is imperative to set deadlines now to ensure stakeholders have the opportunity to fully canvass all of these important issues with NSPI.

In this regard, PHP notes that NSPI's most recent IRP workshop on April 6 did not allow for much interactive participation with stakeholders, as NSPI focused primarily on presenting the material already provided in the slide deck. For future IRP workshops, PHP suggests that NSPI assume participants have had the opportunity to familiarize themselves with the materials so that the interactive sessions can be devoted to detailed collaborative discussions as opposed to a one-way presentation of information. To the extent that any stakeholders have specific questions for NSPI that may be best addressed in separate one-on-one sessions, PHP is also supportive of that approach as well, as such meetings would not detract from the wider overall collaborative discussion that allows for a full sharing of perspectives. PHP suggests that the opportunity for such meetings be considered in establishing the timelines for stakeholder input.

Thank you for seeking comments on the Scope and Timelines for the 2022 IRP Evergreen. PHP looks forward to the opportunity to participate fully as a stakeholder in this process.

Yours truly,



James MacDuff



Blackburn Law

VIA EMAIL

April 14, 2022

Jennifer Ross
Nova Scotia Power

Dear Ms. Ross,

Re: M10504 – NSPI 2022 Evergreen IRP Analysis

The Small Business Advocate (SBA) has been an active participant in the IRP process and provides the following comments following the NSPI IRP Action Plan Update that was presented to stakeholders on April 6, 2022.

NSPI should endeavor to shorten and streamline the analytical process. The policy compliance timelines are becoming shorter while the timeline of certain infrastructure investments (such as transmission interconnections) remains very long. There were several major changes to the planning environment in mid-2021 (Renewable Energy Standard revisions, provincial procurement of 350 MW of renewable capacity, federal carbon pricing, Environmental Goals and Climate Change Reduction Act), but under NSPI's proposed schedule, the impacts of these changes on IRP analysis results will not be known until the end of 2022.

The SBA understands that the modeling process is complex and that NSPI intends to allow for significant stakeholder involvement. However, this timeline will not even allow for the results of the analysis to be incorporated in the Annual Capital Expenditure (ACE) Plan filing. For the Evergreen IRP process to play an important role in decision-making by NSPI and the Board, it needs to be more nimble to assess the impact of rapidly changing market conditions on resource planning options.

One suggestion to streamline the process would be to focus primarily on the highest-impact changes in assumptions. Rather than completely refresh the full set of IRP assumptions (resource capital cost for all technologies, load forecast, etc.) and allow time for stakeholder review and feedback, NSPI could focus on the changes that are likely to impact resource planning priorities. A minor change in the capital cost of wind turbines, for example, is not likely to change the conclusions of the 2020 IRP, but the policy changes mentioned above are likely to have a significant impact on resource investment decisions. Therefore, the focus of this interim analysis should be on high-impact updates and the full set of assumptions can be implemented in the next full IRP.

Analysis should inform stakeholders on how results impact investments and assets considered in other proceedings. NSPI's recent filings in the ACE Plan proceeding, as well as the 10-year System Outlook filing in 2021, raised several questions regarding whether the conclusions of the IRP analysis were reflected in NSPI's system forecasts and expenditure requests. In those proceedings, NSPI deferred several questions to the IRP Update process. Given that IRP analytical updates will be more frequent with the Evergreen IRP structure, NSPI should structure the analysis and reporting so that the connections between resource planning and requests for capital expenditures are clearer. The Evergreen IRP analysis should also identify how the results impact investments and capital expenditures already approved by the Board.

In addition to improving the usefulness of the Evergreen IRP analysis, aligning the timelines and objectives of these proceedings will also help expedite stakeholder review of all NSPI analysis and filings.

It is also the SBA's recommendation that sensitivities are included/structured in a way to give advance warning of when additional analysis is needed. Market and policy conditions can change in many ways, but there are some conditions that are more likely than others. For example, based on long-term trends and the experience since the completion of the 2020 IRP, it is more likely that emissions regulations and pricing, clean energy standards, and net-zero timelines will become more aggressive, rather than less restrictive. NSPI can test a few key sensitivities that would inform stakeholders on the potential need for additional analysis if certain market or policy conditions change.

The SBA would be happy to discuss this comments in more detail if that would be of assistance.

Yours truly,

BLACKBURN LAW



Melissa P. MacAdam

for

E.A. Nelson Blackburn, Q.C.

Small Business Advocate

Attachment 2

NS Power Responses to Stakeholder Comments

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
Evergreen Scenarios, Assumptions and Sensitivities	AREA	How will GHG compliance costs beyond 2022 be modeled? What are the range of reasonable options/alternatives?	The GHG compliance costs will be modeled to maintain consistency with the Federal carbon pricing system. NS Power is considering modeling options that include the federal backstop Output Based Pricing System (OBPS) and/or a series of declining hard caps which achieves similar emissions reductions.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What technical options are available to meet a potential Net Zero 2035 Electricity System Target and how will this potential new policy requirement impact the modeling exercise?	NS Power's starting point for supply resource options will be the 2020 IRP Assumptions. The Clean Energy Standards discussion paper released by the Federal government discusses non-emitting generation options intended to enable the path to a 2035 net zero electricity system, some of which are consistent with the resource options modeled in the 2020 IRP and some which are considered emerging technology. The IRP Action Plan that NSPI is currently progressing puts us on the path towards decarbonization. The 2020 IRP established that a Regional Integration strategy bringing access to low or non-emitting firm imports to meet the 2030 targets and beyond was part

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
			of the lowest-cost resource plans. The proposed Atlantic Loop has been identified as a mechanism to enable this and NS Power is progressing study work as part of the Atlantic Clean Power Roadmap (TSR 411) in support of increased imports of energy and capacity. Regional Integration strategies will be modeled in the evergreen IRP update. Emerging non-emitting sources that have the ability to provide firm, dispatchable capacity have also been identified as an enabling component in meeting Net Zero 2035. The Clean Energy Standards Discussion paper references emerging potential non-emitting resources.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What specific commercial discussions have taken place for near term firm import capacity opportunities by winter 2023/24, what remains to be done to achieve firm capacity over the NS/NB interface by that date, and what are the appropriate long-term forecast assumptions for available firm import capacity for the Study Period?	Please refer to the IRP Action Plan Update (slide 13). NS Power anticipates that availability of firm import capacity over existing transmission infrastructure will continue to be tested as part of the evergreen modeling.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What is the current status of TSR 411 and the Reliability Tie Development, and what would be required to determine a more precise target in-service date than “2025-2029 (or earlier if	TSR 411 is draft complete and in review with the Interconnection Customer. As discussed in the IRP Action Plan Update, the current project scope anticipates 4.5 years to

Theme	Stakeholder	Comment	NS Power Response
		practical and feasible)” for modeling purposes?	completion. NS Power anticipates assuming the Reliability Tie to come into service no earlier than 2027 in the evergreen update.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What are NS Power’s future plans with respect to TSR 412, why was it withdrawn, and what additional analysis/engineering work is required to develop assumptions about the costs and benefits of increasing the size of the existing interconnection with NL?	TSR 412 was submitted to examine a significant new import of capacity and energy from Newfoundland, anticipated to require not only additional transmission capacity but also new generating capacity in NL. Modeling this project would require estimates for new renewable firm capacity development (likely hydro) in NL. This project is not under consideration in the near term.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	How does NS Power propose to model the potential Regional Integration Alternatives associated with the Atlantic Loop and/or imports from the New England market based on updated information, and what are the basis for those assumptions?	The evergreen work to be completed in 2022 will continue to model Regional Integration strategies and additional firm imports above what is currently committed. Additional information on modeling approach will be provided with the draft assumptions.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What are NS Power’s updated assumptions associated with Battery Energy Storage Systems?	More details on BESS modeling assumptions will be included with the draft assumptions.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	In advance of the completion of ongoing wind integration studies, what assumptions is NS Power making with respect to: (1) additional interconnection infrastructure costs and	Modeling assumptions associated with renewable integration will be included with the draft assumptions. The resource capital costs used in the IRP model

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		(2) expected levels of overall wind curtailment associated with both the Nova Scotia Rate Base Procurement and any other new wind that may be modeled during the Study Period?	include allowance for interconnection costs. The level of variable renewable generation curtailment will be an outcome of the evergreen Plexos modeling.
Evergreen Scenarios, Assumptions and Sensitivities	AREA	What are NS Power's updated assumptions associated with Coal Unit Conversions and new Combustion Turbines?	Modeling assumptions associated with coal unit conversions and combustion turbines will be included with the draft assumptions. The modeling assumptions will only be updated where significant change has been observed.
Evergreen Process and Timelines for Completion of Evergreen Modeling	AREA	Provide a formal schedule with specific dates to hold NS Power accountable to deadlines and so that Stakeholders can anticipate workshop timing	Please refer to Attachment 3, slide 7 for a detailed activity schedule related to the evergreen Study Scope.
Evergreen Update Deliverables	AREA	Provide materials in advance and have more opportunity for engagement in the workshop setting	Materials for the next phase of the evergreen process will be provided to stakeholders prior to the associated workshop. The agenda for the next workshop will allow for review of the assumptions and modeling scenarios followed by expanded time for engagement, questions, and feedback.
Evergreen Process and Timelines for Completion of Evergreen Modeling	Small Business Advocate (SBA)	NSPI should endeavor to shorten and streamline the analytical process. One suggestion to streamline the process would be to	The evergreen IRP analysis will be focused on areas of significant change in the planning environment to understand the outcome of

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		focus primarily on the highest-impact changes in assumptions. Rather than complete refresh the full set of IRP assumptions (resource capital cost for all technologies, load forecast, etc.) and allow time for stakeholder review and feedback, NSPI could focus on the changes that are likely to impact resource planning priorities. ...Therefore, the focus of this interim analysis should be on high-impact updates and the full set of assumptions can be implemented in the next full IRP.	these impacts on the electricity strategy. Assumptions that have not materially changed since 2020, or that are not anticipated to significantly impact the modeling outcomes, will not be updated in order to ensure an efficient evergreen process.
Evergreen Process and Timelines for Completion of Evergreen Modeling	Small Business Advocate (SBA)	Analysis should inform stakeholders on how results impact investments and assets considered in other proceedings. Given that IRP analytical updates will be more frequent with the Evergreen IRP structure, NSPI should structure the analysis and reporting so that the connections between resource planning and requests for capital expenditures are clearer. The Evergreen IRP analysis should also identify how the results impact investments and capital expenditures already approved by the Board.	NS Power's evergreen updates will continue to align with the Purpose of the 2020 IRP as set out in the Terms of Reference.
Evergreen Scenarios, Assumptions and Sensitivities	Small Business Advocate (SBA)	It is also SBA's recommendation that sensitivities are	NS Power will consider a range of sensitivities to ensure the evergreen

Theme	Stakeholder	Comment	NS Power Response
		included/structured in a way to give advance warning of when additional analysis is needed. NSPI can test a few sensitivities that would inform stakeholders on the potential need for additional analysis if certain market or policy conditions change.	analysis continues to support a robust assessment of the IRP Action Plan and Roadmap items. NS Power will request stakeholder feedback on proposed sensitivities as part of the scenario plan development.
Evergreen Update Deliverables	E1	E1 requests that the Study Scope include the following deliverables as part of the Evergreen IRP process: 1. Selection of a Reference Plan is required for the development of Avoided Costs due to DSM, which are required for DSM planning and monitoring of rate and bill impacts due to DSM. E1 recommends the Evergreen process include the selection of a Reference Plan and that the evaluation used for selection be transparent and explicit in relation to the metrics used.	The outcome of the evergreen analysis will identify the lowest cost scenario(s) based on planning environment changes. All scenarios will be costed on a partial NPV basis, consistent with the IRP. Lowest cost portfolios will be evident, while commonalities between plans will be identified.
Evergreen Update Deliverables	E1	2. E1 recommends that the Evergreen process include the development of updated avoided costs of DSM. E1 further requests a fulsome stakeholder engagement process is used for the development of the updated avoided costs.	Updated scenarios from the evergreen modeling will be available to use to calculate avoided costs of DSM for future DSM evaluation purposes. NS Power anticipates that DSM assumptions will likely continue to rely upon the 2019 DSM Potential Study.
Evergreen Update Deliverables	E1	3. To ensure meaningful feedback is provided throughout this process	Material to support subsequent phases of the evergreen IRP process will

Theme	Stakeholder	Comment	NS Power Response
		E1 recommends that a minimum of two weeks is provided to stakeholders for all comment periods. Further, E1 notes that information such as reports and analyses which will be used to inform updates to assumptions and inputs in the 2022 Evergreen process (an example from the 2020 IRP would be E3's Pathways Study), should be provided to stakeholders in advance for review and comment at times in the process that allow for meaningful consideration of stakeholder feedback.	be provided in advance of workshop/engagement sessions. NS Power acknowledges the need for sufficient material review time and have incorporated this into the schedule.
Evergreen Scenarios, Assumptions and Sensitivities	E1	E1 understands that NS Power has included Net Zero 2035 as an emissions trajectory for scenario development in the Evergreen process. E1 recommends that the 2022 Evergreen Study Scope focus on analyzing scenarios with this emissions trajectory.	NS Power anticipates that the focus of the environmental policy drivers for most of the modeling scenarios will be on net zero 2035. Net zero 2050 scenarios will be provided for comparison.
Evergreen Scenarios, Assumptions and Sensitivities	E1	Treatment of Carbon Pricing: E1 believes the effects of carbon pricing remain relevant in the context of the 2022 Evergreen IRP Process. In the IRP Action Plan update, NS Power states: <i>NS Power is currently modeling multiple options for GHG compliance beyond 2022, including the federal Output Based Pricing System (OPBS) and a revised hard cap trajectory similar to</i>	The OBPS is system under which the federal carbon price is applied to electricity generation and will be tested in the evergreen IRP analysis, as indicated in the evergreen Study Scope document. The assumptions and modeling scenarios document will identify the proposed assumptions for modeling carbon pricing / carbon limits and will be

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		<i>those used in the 2020 Integrated Resource Plan.</i> Neither of the options listed by NS Power directly note the inclusion of a federal backstop carbon price, although the latter option described is ambiguous with respect to the application of a carbon price for any additional emissions reduction below any hard cap. The scope of the Evergreen process should facilitate the inclusion of a diverse set of carbon pricing options, or at minimum allow for stakeholder input and discussion with regard to the selection in the carbon pricing trajectory for the 2022 Evergreen IRP Process.	open for stakeholder review and feedback.
Evergreen Scenarios, Assumptions and Sensitivities	E1	Resource Strategy: Demand Response (DR) can be a valuable source of firm capacity in NS. E1 recommends that NS Power treat winter peak demand savings from DR as firm peak demand reductions within the context of the Evergreen IRP Process.	Consideration for how DR and the associated peak demand savings will be treated within the model will be reviewed as part of the assumptions review.
Evergreen Scenarios, Assumptions and Sensitivities	E1	Electrification: To the extent that the current draft electrification strategy contemplates ratepayer investment, the associated costs should be reflected in the 2022 Evergreen IRP modelling scope. This will allow for determination of the potential effects on partial revenue requirement in the	Customer investment re: electrification (heat pump and EV adoption) is not an input assumption to the model as it is considered an external cost incurred by the customer. NS Power anticipates incorporating avoided T&D costs of DSM in a manner similar to the 2020 IRP.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		context of Evergreen IRP modelling. Any such costs inputs should be subject to fulsome stakeholder engagement and consultation. Finally, NS Power should consider the variability of differing electrification scenarios with respect to the amount of Transmission & Distribution (T&D) costs included in each scenario. Differing net system requirements and expected peak demand events between electrification scenarios are likely to form differing requirements for T&D.	
Evergreen Scenarios, Assumptions and Sensitivities	E1	2022 Load Forecast: E1's understanding is that the 2022 NS Power Load Forecast deviates significantly from the 2019 Load Forecast which was used in the 2020 IRP. E1 recommends that the scope of the Evergreen 2022 update will include incorporation of the 2022 NS Power Load Forecast.	NS Power will use load assumptions from the Company's 2022 Load Forecast Report.
Evergreen Scenarios, Assumptions and Sensitivities	E1	Sensitivities: Consistent with the 2020 IRP approach, E1 recommends that the 2019 DSM Potential Study scenarios (Low, Base, Mid, Max) be included as a sensitivity within the 2022 Evergreen Study Scope. E1 further recommends that all DSM scenarios from the 2019 Potential Study be paired with each of the scenarios explored within the Scope of	NS Power anticipates incorporating the 2019 DSM Potential Study scenarios into the evergreen IRP modeling and will engage with E1 on appropriate assumptions. The modeling scenarios will be designed to ensure that the modeling scope is reflective of new policy and changing assumptions such that the modeling results

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		the 2022 Evergreen process. This will provide a more fulsome exploration of DSM, which is important recognizing that the primary drivers for this IRP modelling update is more stringent environmental policy and accelerated electrification loads. E1 further recommends that there should be continued emphasis in the 2022 Evergreen scope on sensitivities that explore limitations on available regional integration to reflect continued risk.	and associated commonalities are identified, supporting an updated Action Plan that is robust for informing future planning. NS Power will propose scenarios in the next release and will accept stakeholder comment and feedback on these.
Evergreen Process and Timelines for Completion of Evergreen Modeling	E1	Schedule of Activities: In addition to the high-level timeline provided on slide 7 of the Study Scope of Timeline deck, E1 notes that a more detailed tentative schedule of activities would be assistive for planning purposes.	Please refer to Attachment 3, slide 7 for a detailed activity schedule related to the evergreen Study Scope.
Evergreen Scenarios, Assumptions and Sensitivities	Port Hawkesbury Paper (PHP)	PHP remains unclear from NSPI's IRP Action Plan presentation as to the status of a number of items that will need to be specifically modeled as part of the Evergreen IRP update, including (but not limited to) evolving GHG emission and net zero electricity policies, the status and availability of firm import capacity opportunities beginning in Winter 2023/24, the expected in-service date and updated cost assumptions associated with the Reliability Tie, how to properly model available Regional	Modeling assumptions and scenarios will be provided for stakeholder review and comment as part of the evergreen IRP process.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		Integration Alternatives such as the Atlantic Loop, updated cost and curtailment analysis for the integration of new wind resources, the latest assumptions on coal-to-gas conversions, storage, and combustion turbines, etc.	
Evergreen Process and Timelines for Completion of Evergreen Modeling	Port Hawkesbury Paper (PHP)	For future IRP workshops, PHP suggests that NSPI assume participants have had the opportunity to familiarize themselves with the materials so that the interactive sessions can be devoted to detailed collaborative discussions as opposed to a one-way presentation of information. To the extent that any stakeholders have specific questions for NSPI that may be best addressed in separate one-on-one sessions, PHP is also supportive of that approach as well, as such meetings would not detract from the wider overall collaborative discussion that allows for a full sharing of perspectives. PHP suggests that the opportunity for such meetings be considered in establishing the timelines for stakeholder input. PHP believes that all parties would be better served if NSPI's Study Scope and Timeline includes a specific schedule with firm dates. This form of schedule would provide clarity regarding the	The agenda for the next workshop will allow for review of the assumptions and modeling scenarios followed by expanded time for engagement, questions, and feedback. Please refer to Attachment 3, slide 7 for a detailed activity schedule related to the evergreen Study Scope.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		process for stakeholder review, workshop discussion, and written comment, and help ensure that there are no further delays beyond the end of 2022.	
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight – Consumer Advocate (CA)	NS Rate Base Procurement: We assume that NS Power will include this as an existing resource commitment in all scenarios and sensitivities. We understand that NS Power will not have certainty regarding the resource locations and capacities and will need to make some reasonable assumptions.	The Rate Base Procurement program will be incorporated within the evergreen model.
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight – Consumer Advocate (CA)	Mersey Redevelopment: We assume that NS Power will evaluate this project using the latest costs and considering the considerable uncertainty regarding whether it will be approved.	Modeling assumptions and scenarios will be provided for stakeholder review and comment as part of the evergreen IRP process.
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight – Consumer Advocate (CA)	Maritime Link and Labrador Island Link reliability: Consistent with the Board’s recognition of Mr. Trim’s evidence in the Final Assessment suggesting that the reliability of the Maritime Link will be less than 98%, NS Power should re-evaluate the ELCC of resources delivered via the Maritime Link. The reliability of the Labrador Island Link should also be re-evaluated given continuing issues with the operating deliveries.	NS Power anticipates retaining the ELCC values from the 2020 IRP for the purposes of the evergreen work as these values are reflective of long-term assumptions.
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight –	We also understand that NS Power has already updated its modeling of wind	NS Power has updated its modeling approach to enable dispatch constraints

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
	Consumer Advocate (CA)	resources to allow for curtailments or other mitigation actions to address system stability issues (rather than capping wind resources at 100 MW). We further understand that while system stability and related analyses will not be fully complete in 2022, some early findings will inform ECEI applications and should also be reflected in IRP modeling to the extent feasible.	as a method of wind integration, in combination with integration assets such as the Reliability Tie and BESS systems. NS Power will integrate stability study findings into the evergreen IRP modeling, where possible, as they become available.
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight – Consumer Advocate (CA)	Reliability Tie Considerations: We recommend that the base case for the IRP include significant schedule contingency for the Reliability Tie construction schedule. Normally, there would be some “known unknowns” contingency built into the planning schedule; reflecting the process and technical complexity of working with New Brunswick Power on lengthy new transmission lines, we strongly encourage NS Power to include contingency for “unknown unknowns” in its schedule (and cost estimate, for that matter). Such an allowance would allow for planning consideration of the risks of working with a partner, similar to the issues that emerged in working with Nalcor to achieve timely delivery of the NS Block. Among other factors, NS Power should explicitly consider how long the current supply-chain	As discussed in the IRP Action Plan Update, the current project scope anticipates 4.5 years to completion. NS Power anticipates assuming the Reliability Tie to come into service no earlier than 2027 in the evergreen update. NS Power will consider whether sensitivities on an alternative assumed timeline would add value to the modeling exercise.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		constraints will continue, and how much they might affect the 4½-year lead time for the Reliability Tie.	
Evergreen Scenarios, Assumptions and Sensitivities	Resource Insight – Consumer Advocate (CA)	While the details of any procurement of IT systems recommended in Concentric’s Dispatch Study are outside the scope of the IRP, the IRP planning team should coordinate with the market and operations team to determine how to reflect the benefits of such IT systems in the long-term planning environment. Ideally, a side case could be run to determine the order-of-magnitude system benefits from acquiring such a system. (There may be other benefits that are not well captured in the IRP modeling process.) On a potentially related issue, we understand that Wreck Cove is the only hydro unit with AGC capability. Since most of the other hydro units will continue to operate for the foreseeable future, it would be helpful if those hydro generators could provide at least a limited amount of AGC. If NS Power can identify potential from such technologies, that could result in lower requirements for additional resources that provide ancillary services, either from smart inverters or from spinning machinery (synchronous condensers or generators).	Learnings that inform system response will be considered in the analysis to the extent that the Plexos modeling can achieve the level of granularity to assess the change.
Evergreen Process and Timelines for	Resource Insight –	We suggest the following process to run as an	NS Power agrees with taking a refined approach to the

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
Completion of Evergreen Modeling	Consumer Advocate (CA)	expedited, simplified process building off the early activities identified in NS Power's presentation:	evergreen analysis in 2022 and only focusing on significant changes in the planning environment.
		1. Refresh input assumptions on an expedited schedule. We understand that finalizing some inputs may require more complex steps and be sensitive to stakeholder input. If those modifications are likely to be relatively inconsequential for the evaluation of subsequent submittal issues, preliminary updates could be used. Such inputs might include the electrification strategy, details on the NS Rate Base Procurement, etc. 2. Conduct modeling based on a single scenario. Re-optimization of the capacity plan and demonstration of project cost effectiveness, particularly with respect to generation resources, should be conducted, without including IRP modeling sensitivities. In order to expedite the findings, a preliminary base case could be used, such as: a. Clean Energy Policy: Net Zero 2050 b. Electrification: Current Policy, trended to the end of the IRP period c. Resource Strategy: Limited expansion of new firm imports	NS Power has incorporated the addition of sharing early modeling insights into the evergreen IRP schedule, targeted for release to stakeholders along with draft assumptions and modeling scenarios.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
		3. Review preliminary assumptions and modeling results with stakeholders. A single stakeholder review and comment opportunity would be sufficient. 4. Finalize assumptions for the expedited study and complete base-case modeling. 5. Conduct sensitivity analyses. If NS Power models the effect of adding or omitting each major potential generation resource, it will be able to use the resulting avoided costs in the EAMs for its subsequent ACE submittals.	
Clarification of Action Plan and Roadmap Items	Resource Insight – Consumer Advocate (CA)	Renewable to Retail: The presentation indicated that there was some RtR activity over the last year. Can NS Power share any information regarding that activity?	One application has been submitted by a third party to the NSUARB for approval as a Licensed Retail Supplier (LRS) to provide service under the RtR tariffs starting in 2023. The associated energy amounts are considered in NS Powers load forecast.
Clarification of Action Plan and Roadmap Items	Resource Insight – Consumer Advocate (CA)	Near-Term Firm Imports: The presentation indicated that firm imports might be available for W 2023/24, even though the Reliability Tie would not be available until at least 2026. Can NS Power share any information on the potential source and delivery path?	The near-term firm imports evaluated in the 2020 IRP that form part of NS Power's IRP Action Plan were anticipated to be available over existing transmission infrastructure from NB and NL. Please refer to the IRP Action Plan slides on near term imports for additional details on interfaces being evaluated.

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	<u>NS Power Response</u>
Clarification of Action Plan and Roadmap Items	Resource Insight – Consumer Advocate (CA)	TSR 411: The presentation indicated that the transmission analysis is nearly complete. NS Power should update the parties as soon as feasible about the status of contracting for the import, including capacity, source and other characteristics.	TSR 411 is draft complete and in review with the Interconnection Customer. TSR 411 is a transmission planning study and does not consider commercial aspects of any potential imports.
Clarification of Action Plan and Roadmap Items	Resource Insight – Consumer Advocate (CA)	TSR 412: While this TSR has been withdrawn, understanding the potential for purchases from or through Newfoundland is important. Is additional transmission capacity available in Newfoundland? Would any upgrades be needed in Nova Scotia to accommodate the import? Is there uncommitted capacity on the Maritime Link? Are there sources of firm supply from Newfoundland or HQ, once the LIL is operating as designed?	TSR 412 was submitted to examine a significant new import from Newfoundland, anticipated to require not only additional transmission capacity but also new generating capacity in NL. Modeling this project would require estimates for new renewable firm capacity development (likely hydro) in NL. This project is not under consideration in the near term.

EVERGREEN IRP 2022 SCOPE AND TIMELINE

APRIL 29, 2022

EVERGREEN IRP APPROACH

- The 2020 IRP Roadmap included reference to a process for refining the Action Plan and Roadmap items via an evergreen IRP process. Roadmap Item 8 states the following:

“Continuously refine the Action Plan and Roadmap items via an evergreen IRP process. This process should facilitate annual updates as conditions change and technology or market options develop, and as Action Plan items are completed or significantly advanced. NS Power will include a summary of updates as part of IRP Action Plan reporting and will incorporate the opportunity for stakeholder comment and feedback as part of the update process.”

- In the 2021 IRP Action Plan Update Report, NS Power described the following as part of the evergreen update:
 - IRP Action Plan update highlights significant changes observed in the planning environment which warrant an evergreen update be undertaken in 2022
 - Where significant changes have been identified and additional modeling is warranted, update inputs and modeling scenarios to support assessment of the impact on IRP Action Plan and Roadmap items
 - Continue to progress the current IRP Action Plan items and monitor IRP Roadmap while evergreen updates are underway

CONDITIONS INITIATING EVERGREEN IRP

- Planning environment changes noted in the 2021 IRP Action Plan Update indicate modeling updates are warranted:
 - Environmental Policy changes (carbon policy and pricing, 2030 coal phase-out, 80% RES, and net-zero electricity standard)
 - Updates to key inputs (resource options, electrification)
 - IRP Action Plan progress
- The evergreen work will be informed by updates to the assumptions and scenarios/modeling plan based on significant changes observed post the 2020 IRP.
- Where no significant change is observed, the 2020 IRP assumptions will be retained.

OBJECTIVES/PURPOSE

OBJECTIVES

- Complete a focused evaluation and refinement of the long-term electricity strategy developed as part of the 2020 IRP that is reflective of the current planning environment
- Provide a venue for stakeholder consultation and engagement in NS Power's resource planning as part of the evergreen work

PURPOSE

- Assess the 2020 IRP Action Plan/Roadmap based on recent policy changes
- Update the IRP Action Plan and Roadmap items as required based on the outcome of the analysis

APPROACH

Review and Update 2020 IRP Assumptions

- Identify where significant changes to the key drivers of the 2020 IRP (decarbonization trajectory, electrification load, and resource strategy) and the assumptions exist
- Where significant change has been observed, update the input assumptions that form the basis of the key drivers and modeling scenarios being considered
- Where no significant change has been observed, retain the 2020 IRP assumptions

Update the Scenarios and Modeling Plan

Complete Scenario Modeling and Analysis

PROCESS AND DELIVERABLES

Process Element	Key Considerations	Deliverable	Stakeholder Input Opportunities*
Develop evergreen update Scope and Approach	2020 IRP Roadmap	Study Scope and Timeline	Stakeholder comment period following this workshop
Refresh input assumptions and develop scenarios and sensitivities/early insights	Carbon and Clean Energy Policies	Updated input assumptions	Workshop to review assumptions and scenarios
	Electrification Load Forecasts	Scenario and Sensitivity list	Stakeholder comment period following workshop
	Resource Strategies	Early Insights	
Complete draft modeling and analysis	Perform modeling based on updated inputs and scenarios	Sharing of draft modeling results	Workshop to review draft modeling results Stakeholder comment period following workshop
Finalize modeling and summarize results	Summarize evergreen modelling results and update Action Plan and Roadmap, if appropriate	Summary of evergreen modeling outcomes including changes to Action Plan or Roadmap based on the analysis, if appropriate	Workshop to review final modeling results and Action Plan or Roadmap updates Stakeholder comment period following workshop

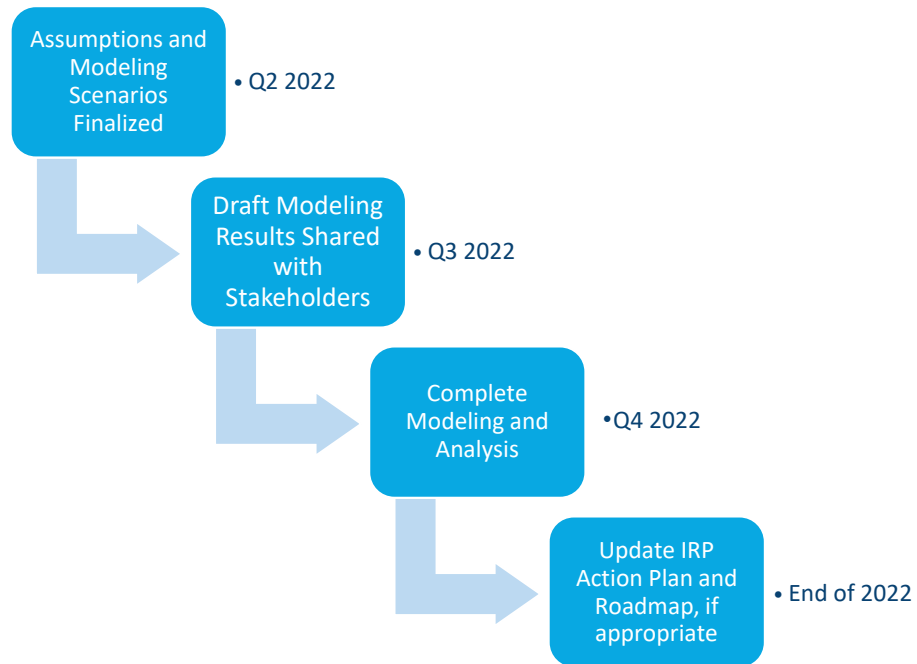
***Materials will be sent in advance of the workshop sessions (feedback will be requested following this date) and the sessions will be structured to allow for Stakeholder feedback throughout the workshop.**

PRELIMINARY DRIVERS AND SENSITIVITIES

Clean Energy Policy	Electrification	Resource Strategy	Sensitivities
Net-Zero Electricity 2035	Current Policy and Trends	Regional Integration	Low-Cost Non-Emitting Capacity
Net-Zero Electricity 2050	Hybrid Peak Mitigation	Distributed Resources	Low-Cost Battery Storage
		Limited Access to new Firm Imports	Low/High Fuel and Import Prices

Scenarios will incorporate 2030 coal phase-out, 80% RES in 2030, and Federal carbon price trajectory

PROCESS TIMELINES



evergreen IRP Phase	Date
File evergreen Study Scope and Draft Responses to Stakeholders	28-Apr-2022
Provide Draft Assumptions and Modeling Scenarios/Early Insights	20-Jun-2022
Stakeholder Workshop	Week of 20-Jun-2022
Stakeholder Feedback Received	4-Jul-2022
Provide Updated Assumptions and Modeling Scenario Plan/Early Insights and Responses to Stakeholder Feedback	18-Jul-2022
Complete Draft Modeling Work/Provide Draft Modeling Results	29-Sep-2022
Stakeholder Workshop - Review Draft Modeling Results	Week of 4-Oct-2022
Stakeholder Feedback Received	13-Oct-2022
Provide Response to Stakeholder Feedback	25-Oct-2022
Complete Modeling and Provide Final Modeling Results/Action Plan and Roadmap Item Updates	15-Nov-2022
Stakeholder Workshop - Review Modeling Results/Action Plan and Roadmap Item Updates	Week of 15-Nov-2022
Stakeholder Feedback Received	30-Nov-2022
Provide Response to Stakeholder Feedback/Update on IRP Action Plan and Roadmap Items	14-Dec-2022

NEXT STEPS

- The materials will be posted on the Nova Scotia Power Integrated Resource Planning website
- Comments on Study Scope and Timeline have been received and NS Power will be filing this document as well as the Stakeholder Feedback/NSPI Response Summary with the UARB on the 29th of April
- Following the completion of the Study Scope and Approach, NS Power will produce assumptions and modeling scenarios for review and comment
 - A workshop will be scheduled to review the assumptions and modeling scenarios
 - Nova Scotia Power will request comments on the assumptions modeling scenarios following the workshop

