Attachment 2 NS Power Responses to Stakeholder Comments

<u>Theme</u>	<u>Stakeholder</u>	<u>Comment</u>	NS Power Response
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

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ricine	StateHolder	COMMICHE	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 capcity. 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

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		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

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		(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

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		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

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Evergreen Update Deliverables	E1	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. 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.	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. 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

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		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: 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	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

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		those used in the 2020	open for stakeholder review
		Integrated Resource Plan.	and feedback.
		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.	
Evergreen Scenarios,	E1	Resource Strategy:	Consideration for how DR
Assumptions and		D	and the associated peak
Sensitivities		Demand Response (DR) can	demand savings will be
		be a valuable source of firm	treated within the model
		capacity in NS. E1	will be reviewed as part of
		recommends that NS Power	the assumptions review.
		treat winter peak demand	
		savings from DR as firm peak demand reductions within	
		the context of the Evergreen	
		IRP Process.	
Evergreen Scenarios,	E1	Electrification:	Customer investment re:
Assumptions and	LI	Electification.	electrification (heat pump
Sensitivities		To the extent that the	and EV adoption) is not an
Scholinica		current draft electrification	input assumption to the
		strategy contemplates	model as it is considered an
		ratepayer investment, the	external cost incurred by
		associated costs should be	the customer.
		reflected in the 2022	
		Evergreen IRP modelling	NS Power anticipates
		scope. This will allow for	incorporating avoided T&D
		determination of the	costs of DSM in a manner
		potential effects on partial	similar to the 2020 IRP.
		revenue requirement in the	

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		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

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		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.

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		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.

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Evergreen Scenarios, Assumptions and	Resource Insight –	process for stakeholder review, workshop discussion, and written comment, and help ensure that there are no further delays beyond the end of 2022. NS Rate Base Procurement:	The Rate Base Procurement program will be
Sensitivities	Consumer Advocate (CA)	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.	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

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	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.

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		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

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Completion of	Consumer	expedited, simplified process	evergreen analysis in 2022
Evergreen Modeling	Advocate (CA)	building off the early	and only focusing on
		activities identified in NS	significant changes in the
		Power's presentation:	planning environment.

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		 Review preliminary assumptions and modeling results with stakeholders. A single stakeholder review and comment opportunity would be sufficient. Finalize assumptions for the expedited study and complete base-case modeling. 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.

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Clarification of	Resource	TSR 411:	TSR 411 is draft complete
Action Plan and	Insight –		and in review with the
Roadmap Items	Consumer	The presentation indicated	Interconnection Customer.
	Advocate (CA)	that the transmission analysis	
		is nearly complete. NS Power	TSR 411 is a transmission
		should update the parties as	planning study and does not
		soon as feasible about the	consider commercial
		status of contracting for the	aspects of any potential
		import, including capacity,	imports.
		source and other	
Clarification of	D	characteristics.	TCD 442 a cultura itta di la
Clarification of Action Plan and	Resource	TSR 412:	TSR 412 was submitted to
	Insight – Consumer	While this TSR has been	examine a significant new
Roadmap Items	Advocate (CA)	withdrawn, understanding	import from Newfoundland, anticipated to require not
	Auvocate (CA)	the potential for purchases	only additional transmission
		from or through	capacity but also new
		Newfoundland is important.	generating capacity in NL.
		Is additional transmission	Modeling this project would
		capacity available in	require estimates for new
		Newfoundland?	renewable firm capacity
			development (likely hydro)
		Would any upgrades be	in NL. This project is not
		needed in Nova Scotia to	under consideration in the
		accommodate the import? Is	near term.
		there uncommitted	
		capacity on the Maritime	
		Link?	
		Are there sources of firm	
		supply from Newfoundland	
		or HQ, once the LIL is	
		operating as designed?	