

EfficiencyOne

IN THE MATTER OF: *The Public Utilities Act*

- and -

IN THE MATTER OF:

NS Power 2023 Evergreen IRP Action Plan
and Roadmap Update

M11307

EfficiencyOne Comments

FILED

September 26, 2023



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1 **1. INTRODUCTION**

2 On August 8, 2023 NS Power filed its 2023 Evergreen Integrated Resource Plan (IRP) Updated Action
3 Plan and Roadmap.¹ The Updated Action Plan and Roadmap reflect the results of the 2022 IRP
4 evergreen process which was undertaken because of significant changes to the planning landscape
5 and included updates to assumptions and modeling scenarios since NS Power filed the 2020 IRP in
6 November 2020.

7
8 On August 31, 2023, the Nova Scotia Utility and Review Board (“NSUARB”) invited comments from
9 participants on NS Power’s 2023 Evergreen IRP Action Plan and Roadmap Update. EfficiencyOne
10 (“E1”) has had an opportunity to review NS Power’s filing as well as comments filed on September
11 8, 2023, by Synapse Energy Economics Inc. (“Synapse”) and Bates White Economic Consulting
12 (“Bates White”) and is pleased to provide the following comments.

13
14 **2. IRP RESULTS**

15 The key results of the IRP Evergreen Process are contained within the Evergreen IRP Updated Action
16 Plan and Roadmap.² This Roadmap provides Key Findings associated with the 2022 Evergreen IRP
17 exercise, as well as Updated Action Plan items associated with the 2022 results.

18
19 The 2022 Evergreen IRP examined a total of twenty-four scenarios. Significantly, neither the 2020
20 IRP, nor the 2022 Evergreen Update, were prescriptive in terms of the ranking of scenarios, and
21 neither provided a “preferred resource plan” as was done within the 2014 Integrated Resource
22 Planning process. Instead, NS Power provides findings and Action Plan Updates on the basis of
23 common themes between the multitude of scenarios examined.

¹ M10504, NS Power 2023 Evergreen Integrated Resource Plan Action Plan & Roadmap Update, Filed August 8, 2023
and M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8,
2023.

² M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8,
2023.

1 Within the 10-year System Outlook filed with the NSUARB, NS Power identified CE1-E1-R2 (i.e., the
2 No Atlantic Loop reference scenario) as the 2022 Evergreen IRP scenario most appropriate for use
3 as the basis of that report.³ E1 considers this to indicate that NS Power views CE1-E1-R2 as forming
4 near-term expectations for new generation, emissions trajectory, and other high-level utility system
5 parameters.

6
7 As the 2020 IRP was the last time that NS Power provided evaluation criteria associated with
8 Resource Plan development, it is meaningful to re-examine the Terms of Reference associated with
9 the 2020 IRP and criteria therein. The primary evaluation criterion was:

- 10
11 - Minimization of the cumulative present value of the annual revenue requirements over
12 the 25-year planning horizon.

13
14 The following secondary criteria were also listed:

- 15 - Magnitude and timing of electricity rate effects;
16 - Reliability requirements for supply adequacy;
17 - Provision of essential grid services for system stability and reliability;
18 - Plan robustness (the ability of a plan to withstand plausible potential changes to key
19 assumptions);
20 - Reduction of greenhouse gas and/or other emissions; and
21 - Flexibility (limitation of constraints on future decisions arising from the selection of a
22 particular path).⁴

23
24 **E1 recommends that the primary and secondary evaluation criteria outlined in the 2020 IRP Terms**
25 **of Reference be considered in analyzing and understanding the results of the Evergreen IRP**

³ M11221, NS Power 2023 10-Year System Outlook Report, Filed June 30, 2023, Page 6.

⁴ M08929, NS Power 2020 Integrated Resource Plan Draft Terms of Reference, Appendix A, Filed December 16, 2019, Page 6.

1 **processes. E1 recommends that NS Power clarify how CE1-E1-R2 was selected for use in the 10-**
2 **year System Outlook.**

3 4 **2.1 Notable Findings and Observations**

5 NS Power provides several findings and observations throughout the Evergreen IRP in relation to
6 capacity addition and generation mix, as well as load and energy efficiency. E1 views many of these
7 observations as reasonable but does wish to comment on several.

8
9 At page 6 of its Updated Action Plan and Roadmap, NS Power states the following:

10 *The bi-directional Atlantic Loop scenario is intended to study the potential for an*
11 *import/export commercial arrangement with Hydro Quebec (HQ), where renewable*
12 *generation is exported to HQ and firm renewable imports are imported to Nova Scotia.*

13 *This scenario adds additional wind to enable the export component of the bi-directional*
14 *scenario import/export transaction.⁵*

15
16 E1 continues to view the Bi-Directional Atlantic Loop scenario as posing a significant degree of
17 project risk. As outlined by Bates White, the expected overall cost of the project is currently \$7.5
18 Billion, up from \$2.9 Billion in 2020.⁶ This amount of volatility in key project characteristics suggests
19 that the project does not yet have a clear definition, or that it continues to evolve. E1 also notes
20 Bates White's observations in its letter of comment with respect to NB Power views around the
21 Atlantic Loop – these are also a risk to project completion in the view of E1.⁷ The requirement to
22 add additional wind, presumably to serve the bi-directional nature of the scenario, also appears to
23 add construction risk given the amount of wind already required to be introduced to the system.

⁵ M11307, NS Power 2023 Evergreen IRP, Updated Action Plan and Roadmap, Filed August 8, 2023, Page 6.

⁶ M11307, Bates White Economic Consulting's Comments on Nova Scotia Power Inc.'s Evergreen IRP Action Plan & Roadmap Update, Filed September 8, 2023, Page 7.

⁷ M11307, Bates White Economic Consulting's Comments on Nova Scotia Power Inc.'s Evergreen IRP Action Plan & Roadmap Update, Filed September 8, 2023, Pages 8-9.

E1 recommends that the reduced Plan Flexibility and risk characteristics associated with the Bi-Directional Atlantic Loop scenario be considered when determining the appropriateness of IRP findings.

At page 13 of its Updated Action Plan and Roadmap, NS Power observed the following regarding Hybrid Peak solutions:

The Hybrid Peak scenarios (E2) show cost savings relative to the base load (E1) scenarios. This indicates that pursuing a hybrid peak solution could have value to customers via avoidance of new firm capacity costs. As NS Power does not have cost estimates for incentives/programs that would be required to enable a Hybrid Peak program in Nova Scotia, costs for this program are not included in the NPVRR values shown in Figure 8.⁸

E1 notes that the cost savings inherent in the Hybrid Peak scenarios arise simply because of the exclusion of Hybrid Peak Mitigation scenarios' costs.

NS Power's emphasis of customer Net Present Value of Revenue Requirement (NPVRR) as well as utility NPVRR in the High Distributed Energy Resources (HDER) scenarios implies that there is value in understanding what the full cost implications may be. In that regard, it should also be noted that hybrid peak mitigation scenarios will necessitate customer costs related to their non-electric heating system that are not presently captured in the IRP evaluation. Examples of such additional costs include insurance, maintenance, fuel costs, and tank replacements, among others.

E1 recommends that the implications inherent in any hybrid peak solution be clarified and that further analysis of the hybrid peak mitigation scenarios include all customer costs and benefits,

⁸ M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8, 2023, Page 13.

1 utility costs and benefits, and all-fuel GHG emissions in an effort to appreciate the economic and
2 decarbonization potential of these scenarios.

3. DSM SELECTION

NS Power's Updated IRP Action Plan and Roadmap states:

The Base Plus and Modified Mid Demand Side Management (DSM) scenarios have higher NPVs across all three NPV time horizons than the equivalent Base DSM scenarios for all sets of comparable scenarios.⁹

E1 wishes to provide additional context regarding the assumptions used and limitations of this conclusion.

3.1 2019 DSM Potential Study

The 2019 DSM Potential Study¹⁰, with limited adjustments to produce two new cases in 2022, was used to develop the energy efficiency and demand response assumptions found within the 2022 Evergreen IRP. This study remains the best source of DSM Potential for use in an IRP process; however, there are limitations of the 2019 Potential Study that may have restricted the amount of DSM selected in the 2022 IRP update:

- For the 2019 DSM Potential Study, an emerging technology measure was not included. This has the benefit of explicitly defining all energy efficiency measures within the potential study but excludes the assumption that future measures will arise due to technology and market development. This assumption is conservative, particularly in the later years of the study period. Further, it is highly unlikely that technology and efficiency developments will cease.

⁹ M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8, 2023, Page 13.

¹⁰ M08929, Demand Response Potential Study for 2021-2045, Prepared by Navigant for EfficiencyOne, Filed August 14, 2019.

- The 2019 DSM Potential Study uses load forecast information from NS Power’s 2018 Load Forecast Report, which assumed very low electrification relative to the 2022 Evergreen IRP. The higher levels of electrification now expected will increase opportunities for energy efficiency into the future. Some electrified loads are initially expected to use high efficiency equipment, but even in this scenario, opportunities for the improvement of the energy efficiency of electrified loads will likely arise over the study period.

The above differences between current conditions and the assumptions made within the 2019 DSM Potential Study indicated that the Potential Study scenarios may be overly conservative.

As electrification activity and planning continue to progress, the DSM Potential Study could prove to become even more conservative over time.

E1 believes that continued electrification planning, such as the planned release of the Electrification Roadmap by NS Power in 2023, may result in an evolving (and better) understanding of the types of electrification contemplated to take place in Nova Scotia – and evolving opportunities for energy efficiency associated with them. The 2022 Evergreen IRP “Current Policy and Trends” electrification trajectory contains expectations for electrification higher than the reference levels of electrification featured in the 2020 IRP, with levels paralleling the 2020 IRP Mid and High electrification scenarios at different times in the study period.¹¹ The 2022 Evergreen IRP also contains an even more aggressive electrification trajectory, as compared to the “Current Policy and Trends” scenario.¹²

To the extent that the continued evolution in electrification understanding results in increased activity and load expectation as compared to today, an outcome which E1 views as possible, additional opportunities for energy efficiency are likely.

¹¹ 2022 Evergreen IRP Updated Assumptions, January 26, 2023, Page 6.

¹² Evergreen IRP Updated Modeling Scenario Descriptions, June 1, 2023, Page 2.

1 The impact from a lack of emerging technology measures within the study is also expected to grow
2 over time – markets and emerging product availability are expected to change over time, producing
3 cumulative differences in the measure portfolio modeled in the 2019 DSM Potential Study, with
4 respect to new and emerging measures available in the NS marketplace.

5
6 **In the context of analyzing the 2022 Evergreen IRP Final Modeling Results, E1 recommends that**
7 **the limitations of the 2019 DSM Potential Study be acknowledged. That is, the 2019 DSM Potential**
8 **Study's limitations may render it conservative relative to current market conditions which may**
9 **offer additional DSM opportunities (e.g., greater electrification activity, emerging technologies).**

10 11 **3.2 Base Plus DSM Modeling**

12 The IRP scenarios modeled the inclusion of both Base and Modified Mid DSM buildouts but only
13 included one Base Plus DSM scenario, namely CE1-E1-R1 BPDSM. The absence of an evaluation of
14 Base Plus DSM within the context of the other modeled scenarios is a limitation. Stakeholders
15 currently lack information regarding the performance of DSM levels between the Base and Modified
16 Mid in these scenarios, despite E1's previous request for their inclusion in each core scenario. As a
17 result, these scenarios may not indicate the economically optimal level of DSM.

18
19 **E1 recommends that the NPVRR results be interpreted with caution, considering the complexities**
20 **of the scenarios and the unknowns regarding the performance of different DSM levels.**

21 22 **3.3 Risk**

23 The IRP scenarios include varying levels of risk depending on factors such as resource mix and
24 selection, in-service dates, retirement dates, and operating reserves.

25
26 Notable risks within the 2022 IRP include:

- 27 - Atlantic Loop costs and availability of firm capacity
- 28 - Fuel costs and availability
- 29 - Effectiveness of peak mitigation strategies

- Emerging resources such as small modular nuclear, geothermal, and hydrogen
- Legislative changes which restrict the selection or use of certain resources
- Required pace of change needed to meet current legislative requirements

Energy efficiency is an established resource in Nova Scotia that is scalable on relatively short timeframes. It is a low-risk resource that is not susceptible to significant project delays or cost overruns at a portfolio level. If NS Power's assumptions regarding uncertain resources prove to be overly optimistic, this could significantly change the optimal resource scenario for Nova Scotia, including additional levels of DSM. DSM can be viewed as a hedge against higher-risk resources.

E1 continues to recommend the development and implementation of a risk matrix for each scenario to assess the degree to which technical, legislative, and stakeholder risks and concerns have been identified within each scenario.

3.4 DSM Beyond Energy Efficiency

The 2022 Evergreen IRP only considered energy efficiency and demand response as DSM resources. "Base DSM" only considered energy efficiency. To the extent other DSM (e.g., distributed energy resources) activities are contemplated in the future, it should be recognized that these were not included in the modeled DSM activities, savings or expenditures in the 2022 evergreen IRP. **It is recommended that these other DSM activities be considered separate and distinct, when compared with the results of the 2022 IRP associated with DSM in particular.**

4. AVOIDED COSTS

Avoided costs, in the context of the IRP, refer to the costs that a utility or system operator can avoid or mitigate by implementing specific resource options or DSM measures. These costs are fundamental considerations when determining the optimal way to meet future electricity demand while considering various economic, environmental, and reliability factors. By considering these avoided costs, utilities, and regulators can make informed decisions that optimize the energy mix while minimizing financial and environmental impacts.

1 To develop the 2026-2030 DSM plan, E1 requires updated avoided costs from NS Power for DSM
2 resources such as energy efficiency, demand response, solar PV, and electrification. Within the 2023
3 IRP Update to Action Plan and Roadmap¹³, NS Power has targeted providing these avoided costs by
4 the end of 2023 in collaboration with the DSMAG. The update should encompass existing avoided
5 costs related to energy, capacity, carbon, transmission, and distribution, as well as any additional
6 costs specific to DSM resources that will be explored in the DSM Plan. **E1 recommends a thorough
7 and transparent stakeholder engagement process for the development of these updated avoided
8 costs.**

9
10 E1 intends to engage with the DSMAG starting in September to reach agreement on the final
11 selection of the Preferred Resource Plan, which will be used to determine the avoided costs for the
12 2026-2030 DSM Plan. E1 agrees with NS Power's proposed approach but highlights that any
13 significant delays in this schedule will pose challenges in modeling the 2026-2030 DSM Plan. As
14 previously discussed E1 intends to begin modeling the 2026-2030 in Q1 of 2024 and will need
15 updated avoided costs by the end of 2023 to support this. To achieve this timeline, it is important
16 that the avoided cost engagement with the DSMAG begins as soon as possible with NS Power
17 outlining the methodology, approach and kicking off development, not only for those avoided costs
18 that are developed using the IRP but also Transmission and Distribution (T&D) as a minimum.

19
20 **E1 requests that considerations related to avoided costs in the context of Distributed Energy
21 Resources (DERs) and electrification activities be examined.** These considerations should factor in
22 their varying impacts on the transmission and distribution system, and the possibility of added total
23 system costs in the case of electrification activities.

¹³ M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8, 2023, Page 18.

1 **E1 continues to request that NS Power propose an appropriate methodology for valuing the**
2 **avoided costs of demand response.** This can be achieved either by wholesale removal of all DSM
3 or by removing energy efficiency and demand response independently, although the latter
4 approach may entail greater complexity in the avoided cost analysis.

5 6 **4.1 High Distributed Energy Resources (HDER) Scenario**

7 E1 noted that the HDER scenarios, which include significant investment in rooftop solar PV systems,
8 showed favorable utility NPVRR results. Notably, CE1-E1-R2 HDER stood out with the lowest utility
9 NPVRR, end effects exclusive, and the fourth lowest utility NPVRR, end effects inclusive; clearly
10 demonstrating the significant utility-value of customer-sited solar PV.

11
12 NS Power has provided and emphasized estimates of customer costs for solar PV in these high DER
13 scenarios. However, E1 strongly advises against dismissing the overall value of the high DER
14 scenarios based solely on customer costs for several reasons:

- 15 • The primary objective of the IRP is to optimize utility costs (revenue requirement). There
16 are many scenarios with customer costs that have not been accounted for, including all
17 electrification customer costs and hybrid peak mitigation costs. To only account for
18 customer costs in select scenarios introduces a bias against those scenarios.
- 19 • Incorporating customer costs into the utility revenue requirement without considering
20 corresponding customer benefits can lead to an incomplete assessment. Further analysis
21 might reveal that these scenarios are optimal not only from the utility's perspective but
22 also for participants.
- 23 • NS Power's cost assumption for solar PV was \$3 per Watt, which appears relatively high
24 compared to what E1 has experienced in the past. In E1's experience, the average
25 residential costs have been closer to approximately \$2.5 per Watt.
- 26 • Commercial and industrial customers may enjoy even lower costs due to the economies
27 of scale associated with larger projects. Moreover, many of these customers may be
28 eligible for the Federal Investment Tax Credit (ITC), and other incentives that can further
29 reduce customer costs.

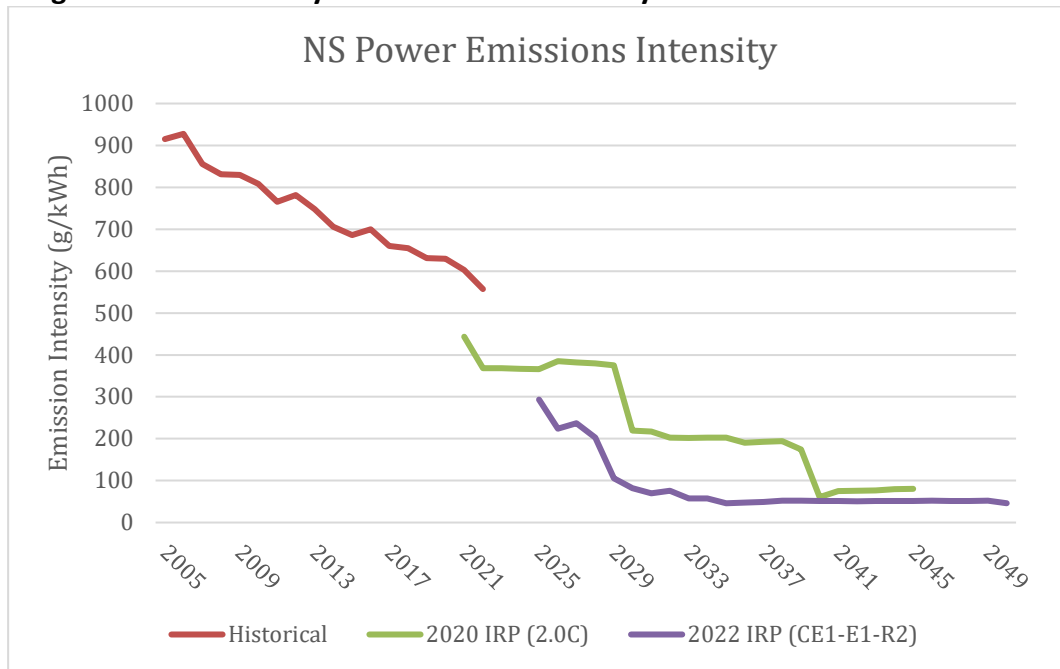
1 E1 wishes to highlight the utility benefits of distributed energy resources, such as solar PV, as shown
2 in the HDER scenarios modeled. **E1 recommends that further work should be completed to study**
3 **the full costs and benefits of DERs and to better understand how these resources can be optimized**
4 **to maximize grid benefits.**

5 6 **5. NEAR-TERM PROGRESS ON EMISSIONS REDUCTIONS**

7 As part of the Evergreen IRP Final Modeling Results released on May 29th, 2023, NS Power provided
8 annual GHG emissions and energy production for each scenario.¹⁴ In Figure 1, E1 has compiled
9 actual historical emissions intensities, modeled emissions intensity from the Reference Plan in the
10 2020 IRP (Scenario 2.0C), and modeled emissions intensity from the 2022 IRP presumed Reference
11 Plan (Scenario CE1-E1-R2).

12
13 E1 notes that there is a significant drop in emissions intensity from the most recent historical data
14 (557 g/kWh in 2022) compared to the first modeled year of the 2022 IRP (293 g/kWh in 2025). This
15 represents a 47% decrease in emission intensity over three years (2023-2025) and would represent
16 the steepest drop in emission intensity over the period studied. Given the tight timelines required
17 to achieve environmental goals such as 80% renewables by 2030, coal retirement by 2030, and net-
18 zero electricity by 2035, any delays or reductions in planned 2023-2025 activities could increase the
19 challenges of meeting these targets.

¹⁴ Evergreen IRP Final Modeling Results, May 29, 2023.

Figure 1 - NS Power System Emissions Intensity – Historical and IRP Scenarios

E1 requests that NS Power provide additional information relating to the planned activities throughout 2023-2025 that will induce the significant drop in emission intensity that is forecasted for these years. E1 further requests that NS Power provide an update regarding whether these activities are on-track and what related risks and risk mitigation strategies have been identified.

6. ACTION PLAN AND ROADMAP

6.1 Review of Action Plan and Roadmap Items

E1 has reviewed the action plan / roadmap sections of the document provided. In addition to the general comments included in the document, E1 has the following additional and specific comments relating to those sections:

Action Plan Item 1b: Regional Integration

This action plan item suggests NS Power will continue to look for opportunities to advance the Atlantic Loop. As suggested elsewhere in this submission, there are several risks present in the Atlantic Loop, and NS Power may be better served by broadly examining import opportunities, as suggested by Bates White.

1 Action Plan Item 2a: Electrification Impacts – Transmission and Distribution (T&D) System

2 This action plan indicates NS Power intends to pursue an analysis of T&D system impacts from
3 electrification.

4
5 **E1 strongly agrees with Action Plan Item 2a and recommends that NS Power carry the results of**
6 **this analysis into the estimation of avoided costs of T&D. E1 expects these avoided costs to grow**
7 **with increased level of system build-out anticipated as part of increased load growth in coming**
8 **years.**

9
10 Action Plan Item 4b: Hybrid Peak Mitigation Scenario

11 NS Power intends to further study the hybrid peak mitigation electrification scenario to develop
12 cost estimates and a validation of savings potential.

13
14 **E1 agrees that an understanding of the cost and impacts of the Hybrid Peak Mitigation Scenario**
15 **is important. To the greatest extent possible, E1 recommends that the analysis should**
16 **contemplate non-technical factors, such as product availability, expected customer behaviour,**
17 **and other non-technical factors affecting risk and be shared with stakeholders as well.**

18
19 Roadmap Item 1: Wind Integration Studies

20 NS Power intends to publish the results of ongoing wind integration studies in 2023, providing
21 guidance and monitoring for any major changes going forward. **E1 agrees that an additional study**
22 **of renewable integration would be beneficial and recommends that any future work on wind**
23 **integration recognize the emerging value of demand response as a tool for wind integration.**

24
25 Roadmap Item 4: Installed Costs of Wind, Solar and Energy Storage

26 NS Power plans to continue to track the costs of wind, solar and storage to assess changes in costs.
27 **E1 strongly agrees with this and expects the costs of solar and battery storage to continue to**
28 **evolve and require monitoring.**

1 Roadmap Item 6: Electrification and Load Growth

2 NS Power plans to continue to monitor electrification and load growth within Nova Scotia. **E1**
3 **supports this important work and recommends that any learnings be used to provide updates to**
4 **the core electrification forecasts contained within the Load Forecast processes.**

5
6 Roadmap Item 7: Evergreen IRP

7 NS Power suggests that the Evergreen IRP process “should facilitate annual updates as conditions
8 change and technology or market options develop, and as Action Plan items are completed or
9 significantly advanced.”¹⁵

10
11 **E1 agrees that the Evergreen process should facilitate annual updates. E1 requests that NS Power**
12 **clarify whether this means additional modeling should be completed each year, or whether that**
13 **decision is expected to be made by NS Power, stakeholders, or some other group.**

14
15 **6.2 Review of Synapse and Bates-White Letters of Comment**

16 As part of E1’s review of the IRP Action Plan Update, E1 has reviewed Synapse’s Comments on Nova
17 Scotia Power’s August 2023 updated Action Plan and Roadmap.¹⁶ In general, Synapse stated they
18 supported the methods underlying the technical and economic analyses of NS Power’s findings for
19 many, but not all, of the elements in the Action Plan.

20
21 In general, Synapse comments are summarized, at a high level, below:

- 22 • Synapse supported the continued planned assessments regarding the viability of the
23 regional integration strategies and the economics of firm imports. Synapse emphasized the
24 need to clarify the capital costs of the Atlantic Loop, and the cost associated with any

¹⁵ M11307, NS Power 2023 Evergreen Integrated Resource Plan, Updated Action Plan and Roadmap, Filed August 8, 2023, Page 20.

¹⁶ M11307, Synapse Comments on Updated Action Plan and Roadmap, 2023 Evergreen Integrated Resource Plan, Filed September 8, 2023.

1 firming of energy import and export assumptions. They recommended NS Power re-run the
2 analysis of the Atlantic Loop as more information becomes available.

- 3 • Synapse recommended that the development of the Reliability Tie continues to be a high
4 priority item for NS Power due to the significant reliance on wind, at least 2,000MW, by
5 2030 in each of the modeled scenarios.
- 6 • Synapse recommended that NS Power develop a procurement strategy for solar and wind
7 resources, and continued study work to identify opportunities to reduce curtailment.
8 Synapse also recommended that NS Power prioritizes a procurement plan and develops a
9 plan to ensure adequate interconnection resources are available.
- 10 • Synapse supported NS Power's ongoing planning around an electrification strategy.
- 11 • Synapse supported NS Power's plan to continue to review curtailment issues and identify
12 opportunities to reduce curtailment. They recommended that NS Power should provide
13 more detail to stakeholders around the import and export characteristics for the scenarios
14 modeled. Synapse also recommended that NS Power should clearly describe the extent to
15 which exports from Nova Scotia are considered allowable under the different scenarios and
16 that specific scenarios with considerably higher levels of nameplate battery capacity be
17 included as part of the exploration of means to mitigate curtailment levels.
- 18 • Synapse notes that hydrogen is not competitive with batteries at this time, based on the
19 results of resource additions relating to hydrogen only being pursued in high-battery-cost
20 sensitivities.

21
22 E1 agrees with the points made by Synapse and would like to see their recommendations
23 implemented in future work associated with IRPs, as well as the implementation of Action Plan and
24 Roadmap items.

25
26 Within the letter of comment, Synapse supported the development of 4-hour battery storage
27 capacity with at least 100MW of in-service capacity by 2030. However, Synapse was concerned that
28 the pre-IRP capacity value study from 2019 did not fully capture the diversity effects that exist
29 among DER and DR resources. They were also concerned that the capacity accreditation given to

1 battery resources in the IRP update was too low. Synapse recommended, prior to the next IRP
2 update, that the capacity value study should be updated to reflect the full measure of diversity
3 effects considering all DER and DR resources. Synapse also requested that the battery storage
4 Effective Load Carrying Capacity (ELCC) profile needs to be carefully reexamined prior to the next
5 IRP update. Synapse stated that the current input assumptions used for ELCC for the portfolio of
6 resources do not fully capture this critically important dynamic. The effect of this shortcoming was
7 a failure of the capacity expansion portion of the modeling exercise to fully capture the interactive
8 effect and thus produce a potentially sub-optimal output in the selection of capacity resources.

9
10 Synapse recommended further study on coal turbine conversion (or combustion turbine addition)
11 in light of potential updates to the battery storage modeling. They also recommended updating the
12 analysis of battery storage prior to committing to reaching the modeled levels of combustion
13 turbine additions shown in the IRP scenarios.

14
15 **E1 agrees with Synapse’s comments relating to ELCC and wishes to specifically emphasize the**
16 **value of updating the input assumptions around ELCC in relation to DER and DR resources to**
17 **ensure these resources are not underutilized, or that other resources are not over-built, on the**
18 **basis that the capacity contributions from these technologies have been undervalued.**

19
20 E1 has reviewed the Bates White Letter of Comment and wishes to state its concurrence with Bates
21 White’s analysis of the Atlantic Loop. E1 shares similar concerns surrounding project risk but does
22 support NS Power’s plan to explore “other opportunities for regional integration” as part of the IRP
23 Action Plan.¹⁷ This is not to suggest that the Atlantic Loop does not warrant further consideration,
24 but it should not form the only consideration for regional imports.

¹⁷ M11307, 2023 Evergreen Integrated Resource Plan, Bates White Comments on Updated Action Plan and Roadmap, Filed September 8, 2023, Pages 6-9.

7. CONCLUSION

E1 appreciates the opportunity to provide comments on, and recommendations related to NS Power's updated Action Plan and Roadmap and appreciates the opportunity to participate throughout the 2022 Evergreen IRP Process. E1 offers the following recommendations:

1. E1 recommends that the primary and secondary evaluation criteria outlined in the 2020 IRP Terms of Reference be considered in analyzing and understanding the results of the Evergreen IRP processes.
2. E1 recommends that NS Power clarify how CE1-E1-R2 was selected for use in the 10-year System Outlook.
3. E1 recommends that the reduced Plan Flexibility and risk characteristics associated with the Bi-Directional Atlantic Loop scenario be considered when determining the appropriateness of IRP findings.
4. E1 recommends that the implications inherent in any hybrid peak solution be clarified and that further analysis of the hybrid peak mitigation scenarios include all customer costs and benefits, utility costs and benefits, and all-fuel GHG emissions in an effort to appreciate the economic and decarbonization potential of these scenarios.
5. In the context of analyzing the 2022 Evergreen IRP Final Modeling Results, E1 recommends that the limitations of the 2019 DSM Potential Study be acknowledged. That is, the 2019 DSM Potential Study's limitations may render it conservative relative to current market conditions which may offer additional DSM opportunities (e.g., greater electrification activity, emerging technologies).
6. E1 recommends that the NPVRR results be interpreted with caution, considering the complexities of the scenarios and the unknowns regarding the performance of different DSM levels.
7. E1 continues to recommend the development and implementation of a risk matrix for each scenario to assess the degree to which technical, legislative, and stakeholder risks and concerns have been identified within each scenario.

- 1 8. It is recommended that DSM activities not tested in the 2022 Evergreen IRP be considered
2 separate and distinct, when compared with the results of the 2022 IRP associated with DSM
3 in particular.
- 4 9. E1 recommends a thorough and transparent stakeholder engagement process for the
5 development of these updated avoided costs.
- 6 10. E1 requests that considerations related to avoided costs in the context of Distributed Energy
7 Resources (DERs) and electrification activities be examined.
- 8 11. E1 continues to request that NS Power propose an appropriate methodology for valuing the
9 avoided costs of demand response.
- 10 12. E1 recommends that further work should be completed to study the full costs and benefits
11 of DERs and to better understand how these resources can be optimized to maximize grid
12 benefits.
- 13 13. E1 requests that NS Power provide additional information relating to the planned activities
14 throughout 2023-2025 that will induce the significant drop in emission intensity that is
15 forecasted for these years. E1 further requests that NS Power provide an update regarding
16 whether these activities are on-track and what related risks and risk mitigation strategies
17 have been identified.
- 18 14. E1 strongly agrees with Action Plan Item 2a and recommends that NS Power carry the results
19 of this analysis into the estimation of avoided costs of T&D. E1 expects these avoided costs
20 to grow with increased level of system build-out anticipated as part of increased load growth
21 in coming years.
- 22 15. E1 agrees that an understanding of the cost and impacts of the Hybrid Peak Mitigation
23 Scenario is important. To the greatest extent possible, E1 recommends that the analysis
24 should contemplate non-technical factors, such as product availability, expected customer
25 behaviour, and other non-technical factors affecting risk and be shared with stakeholders as
26 well.
- 27 16. E1 agrees that an additional study of renewable integration would be beneficial and
28 recommends that any future work on wind integration recognize the emerging value of
29 demand response as a tool for wind integration.

- 1 17. E1 strongly agrees with NS Power's plans to continue to track the costs of wind, solar and
2 storage to assess changes in cost, and expects the costs of solar and battery storage to
3 continue to evolve and require monitoring.
- 4 18. In the context of electrification and load growth, E1 supports this important work and
5 recommends that any learnings be used to provide updates to the core electrification
6 forecasts contained within the Load Forecast processes.
- 7 19. E1 agrees that the Evergreen process should facilitate annual updates. E1 requests that NS
8 Power clarify whether this means additional modeling should be completed each year, or
9 whether that decision is expected to be made by NS Power, stakeholders, or some other
10 group.
- 11 20. E1 agrees with Synapse's comments relating to ELCC and wishes to specifically emphasize
12 the value of updating the input assumptions around ELCC in relation to DER and DR
13 resources to ensure these resources are not underutilized, or that other resources are not
14 over-built, on the basis that the capacity contributions from these technologies have been
15 undervalued.