

2024 10-Year System Outlook Report (NSUARB M11764)
NSPI Responses to CA Information Requests

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1 **Request IR-1:**

2
3 **Re: Exh. N-1, p. 15**

4
5 **(a) Please confirm that the 10-year System Outlook does not identify enhanced**
6 **geothermal system energy projects as an “emerging technology.”**

7
8 **(b) Please state whether Nova Scotia Power is aware that Fervo Energy recently**
9 **demonstrated a successful production-scale enhanced geothermal system project in**
10 **Nevada and that most of the technology being deployed by Fervo Energy is proven in**
11 **the oil and gas industry, suggesting a strong potential for it to scale rapidly.**

12
13 **(c) Please confirm that the primary evidence cited by NS Power in M11458 to justify its**
14 **understanding that the potential for grid scale geothermal generation in Nova Scotia**
15 **is a November 2022 webinar featuring Russell Dmytriw of Net Zero Atlantic in which**
16 **Mr. Dmytriw says:**

17
18 **Currently when we look around the world [geothermal] electricity**
19 **plants do not exceed 5.5 km in depth . . . Well, what we’re seeing [in**
20 **Nova Scotia] is that we’re right on the edge of that ... with improving**
21 **technologies ... we may actually be in that window.¹**
22

23 **(d) Please confirm that all of the evidence cited by NS Power in M11458 as informing its**
24 **views on enhanced geothermal energy entirely predates the Fervo Energy project**
25 **launch.**

26
27 **(e) Please identify what steps Nova Scotia Power has taken to monitor and investigate**
28 **Fervo Energy and other companies that are developing enhanced geothermal**
29 **systems.**
30

¹ Reviewed at: <https://netzeroatlantic.ca/outreach/webinar-series/exploring-nova-scotias-geothermal-opportunities>

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1 (f) Please explain whether NS Power agrees that it should give greater consideration to
2 improving geothermal technologies, perhaps similar to or even greater than small
3 modular nuclear reactors and tidal generation, and its reasons for taking its position.
4

5 Response IR-1:
6

7 (a-f) Although the reference on page 15 of the 10-Year System Outlook report does not
8 specifically include geothermal, it is considered a technology that NS Power will continue
9 to monitor. The Evergreen IRP Updated Action Plan & Update, IRP Roadmap Item 8:
10 Emerging technologies provides as follows:
11

12 Monitor developments in technology/enabling policy for emerging
13 resources including, but not limited to, SMRs, **geothermal**, hydrogen
14 combustion turbines, and long duration storage. Significant changes in cost
15 or availability from IRP assumptions may trigger a specific analysis as
16 needed.² [emphasis added]
17

18 The 10-Year System Outlook report and 2024 ACE Plan CA IR-31 (M11458) restates NS
19 Power's commitment to continuing to monitor developments in emerging technologies,
20 which includes Enhanced Geothermal System (EGS) projects like Fervo Energy's 3.5 MW
21 pilot site. Where this site entered test operation in mid-2023, following the conclusion of
22 the Evergreen IRP modeling, the information from this pilot was not included in the IRP
23 alternatives analysis.
24

25 NS Power agrees that EGS projects, like Fervo Energy's, are in an early or pre-commercial
26 phase similar to Tidal and SMRs. These technologies do not impact the resource
27 development plan to 2030 as described in the 2024 10-Year System Outlook. Resource
28 plans beyond 2030 will be informed by future IRPs, where continuing developments in
29 emerging technologies can be incorporated for consideration.

² 2023 Evergreen Integrated Resource Plan – Updated Action Plan and Roadmap (M11307), December 8, 2023,
page 19. [_Nova Scotia Power Evergreen IRP \(nspower.ca\)](https://www.nspower.ca)

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1 **Request IR-2:**

2
3 **Re: Exh. N-1, p. 9**

4
5 **(a) Please provide the amount of peak forecast reduction associated with “adoption of**
6 **hybrid heating scenario,” by year, in Figure 2. If exact numbers are not available,**
7 **please provide estimates.**

8
9 **(b) Please provide a detailed explanation of the work NS Power has completed to advance**
10 **“adoption of hybrid heating scenario,” (IRP Action Plan Item 4b)**

11
12 **(c) Please provide details on participation in any studies in partnership with other**
13 **organizations, including any available timelines, study scopes, contractors, or other**
14 **pertinent planning information.**

15
16 **(d) Please provide NS Power’s current action plan to achieve the peak forecast reduction**
17 **referenced in part (a) of this question.**

18
19 **(e) If the response to part (d) of this question partially relies in behavior of or decisions**
20 **made by retail customers, please provide any documents that describe how NS Power**
21 **plans to mitigate risk associated with customer behavior or decisions that deviate**
22 **significantly from NS Power’s assumptions**

23
24 **Response IR-2:**

25
26 **(a) Please refer to NSUARB IR-18.**

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1 (b) As part of its 2020 IRP Action Plan, NS Power completed and published *The Economics*
2 *of Electrification in Nova Scotia*.¹ This report identified the potential for a Hybrid Peak
3 scenario in Nova Scotia and developed an estimate of potential peak and energy savings
4 associated with its implementation in the province. The load reductions from this scenario
5 were modeled, along with other load scenarios, in the 2023 Evergreen IRP and
6 demonstrated the potential for cost savings. No estimate of program cost was included in
7 the Evergreen IRP study as cost estimates would depend on the specifics of program design
8 and funding.

9
10 The identified potential benefits of this program led to its inclusion in the August 2023
11 Evergreen IRP Action Plan. The Province of Nova Scotia incorporated the Hybrid Peak
12 program into its Clean Power Plan, released in October 2023. NS Power's aligned *Path to*
13 *2030* report, included in the 2024 ACE Plan proceeding, also included the Hybrid Peak
14 program and noted alignment between NS Power and the Provincial Government that the
15 province was accountable for the development of a Hybrid Peak program, with NS Power
16 participating in a broader sector study.

17
18 In the first half of 2024, NS Power has met with the Department of Natural Resources and
19 Renewables on their approach to a Hybrid Peak study as part of the Load Management
20 initiative of the Clean Power Plan. Please refer part (c) below for further information.

21
22 (c) Net Zero Atlantic has confirmed that they plan to initiate a study to examine Hybrid Peak
23 options in the fall of 2024 on behalf of the Department of Natural Resources and
24 Renewables. NS Power understands that the study will include key stakeholders within the
25 province including EfficiencyOne and organizations representing fossil fuel heating
26 sources used in Nova Scotia. NS Power has agreed to complete resource planning modeling
27 in support of the study objectives. NS Power understands that the current estimated
28 timeline for completion of the study is Q2 2025.

¹ https://www.nspower.ca/docs/default-source/irp/e3_ns-power_electrification-report.pdf

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1 (d) Achieving Hybrid Peak scenario peak reductions are contingent on the completion of work
2 referenced in part (b). The completion of a Hybrid Peak study will provide guidance on
3 how to achieve associated peak reductions. Otherwise, the 10-Year System Outlook report
4 provided the following with respect to ongoing efforts to contribute to peak reduction:

5
6 Peak savings related to Demand Response (DR) activities, adjusted for
7 Effective Load Carrying Capability (ELCC) as outlined in the 2022
8 Evergreen IRP and including Direct Load Control (DLC), Time Variable
9 Pricing (TVP) and Business, Non-Profit and Institutional (BNI)
10 Curtailment, are included in the firm peak. Customer growth, electrification
11 of heating and increased EV sales increase the peak, while DSM and DR
12 activities reduce the peak.²
13

14 (e) NS Power's long term resource plan incorporates DSM and Demand Response
15 programming with multiple program components, including the hybrid peak program.
16 Each of the programs in this portfolio relies on customer behaviours and decisions. The
17 portfolio approach has the benefit of spreading the anticipated peak and energy reductions
18 across multiple programs, potentially reducing the risk. In addition, NS Power maintains a
19 Planning Reserve Margin (PRM) of firm capacity over the forecast firm peak; this PRM
20 provides a margin against uncertainties in load growth and resource availability (including
21 demand side resources).

² 10 Year System Outlook Report (M11764), June 27, 2024, page 8 of 67.

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Request IR-3:

Re: Exh. N-1, p. 57

(a) Please explain what steps NS Power has taken to ensure that the civil construction aspects of the Reliability Tie will be complete in time to meet the target in-service date of 2028. In your response, please provide the current risk register or any equivalent document that discusses schedule risks associated with the construction of roads, transmission structure foundations, and other significant civil works associated with the Reliability Tie.

(b) Please provide a list of all high-voltage equipment (including but not limited to transformers and circuit breakers) required for the Reliability Tie and the procurement status of each item. If no such list exists, please identify any such equipment that has been procured for the Reliability Tie.

(c) For any item identified in the response to part (b) that has does not have a firm delivery date consistent with the target in-service date of 2028, please describe NS Power's risk mitigation plan for late delivery.

Response IR-3:

(a) NS Power has completed or set in motion the following studies and project activities to advance completion of the civil construction aspects of the Reliability Tie in time to meet the current target in-service date of 2028:

- Geomorphology and geotechnical assessment of the Reliability Tie sited route.**

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- Proactive identification of high-risk areas along the sited route and continued collaboration with local subject matter experts to develop mitigation strategies for project construction.
- Access study to determine optimal access route and alternatives.
- Development of a range of structural foundations for various soil types.
- Site visits were conducted as part of structure spotting exercises at various stages of project design to avoid high risk areas.
- Design/Constructability review workshop was conducted with field specialists to identify potential risks that could cause delays, along with developed strategies for mitigation.

Please refer to Confidential Attachment 1 for the Reliability Tie Project's construction-related risk register.

- (b) Purchase orders for the high voltage equipment required for the necessary upgrades to the 67N Onslow substation for the tie line project were issued in the spring of 2024. This equipment includes: breakers, current transformers and potential transformers, surge arrestors, and disconnects.
- (c) Confirmed delivery dates for the high voltage equipment listed in part (b) above are within the planned schedule and project in-service date.

**Confidential CA IR-03 Attachment 1
has been removed due to confidentiality.**

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REDACTED

Request IR-4:

Re: Exh. N-1, p. 19.

(a) Please provide an accounting of all costs associated with the five times Lingan Unit 2 was recalled to service.

(b) Please include all available detail in the breakdown of costs as well as a summary of (a) startup costs, (b) non-fuel operating costs, (c) fuel costs during operation, and (d) shutdown costs for each of the five events.

(c) Please include the generation for each of the five events.

Response IR-4:

(a-c) Please reference table below.

Online	Offline	Generation MWh (Net)	Startup Costs (Liquid Fuel)	Non-Fuel Operating Costs	Fuel Costs (Solid Fuel & Additives)
11/20/2023	11/27/2023	11,762	\$58,847	\$106,364	
12/6/2023	12/8/2023	3,515	\$89,080	\$31,786	
1/23/2024	2/1/2024	21,634	\$98,502	\$62,978	
2/6/2024	2/14/2024	16,765	\$36,459	\$48,804	
2/21/2024	2/28/2024	13,960	\$36,860	\$40,638	

- The startup cost column includes light and heavy fuel oil costs associated with each event.
- The non-fuel operating costs column includes OM&G costs associated with each event.

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REDACTED

- 1 • The fuel costs column includes solid fuel and additive costs associated with each
2 event.
3
- 4 • Costs associated with shutting the unit down (Fuel, labor, etc.) are included in
5 “Non-fuel operating costs” and “Fuel costs” columns for each event and are not
6 broken out separately.

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1 **Request IR-5:**

2
3 **Re: Exh. N-1, p. 45.**

4
5 **Please state when NS Power intends to revisit its planning reserve margin.**

6
7 Response IR-5:

8
9 The Evergreen IRP Updated Action Plan & Update, IRP Roadmap Item 2: Sustaining Capital
10 provides, in part, as follows:

11
12 Monitor required levels of sustaining capital investment for significant changes
13 from IRP assumptions and, if observed, trigger a unit-specific analysis of
14 alternatives. Monitor unit reliability for significant changes from IRP assumptions
15 and, if observed, trigger an Effective Load Carrying Capability (ELCC) calculation
16 and/or Planning Reserve Margin (PRM) study as required.¹
17

18 No significant changes from IRP assumptions have been observed at this time requiring a PRM
19 study. NS Power's PRM was last studied in the 2019 Planning Reserve Margin and Capacity Value
20 Study completed by E3 which reaffirmed NS Powers target PRM of 20 percent was appropriate.
21 The value of maintaining this level of PRM was observed on February 4, 2023 when NS Power
22 served a record hourly peak load of 2455 MW, during a severe cold weather event.

¹ 2023 Evergreen Integrated Resource Plan – Updated Action Plan and Roadmap (M11307), December 8, 2023, page 18. [Nova Scotia Power Evergreen IRP \(nspower.ca\)](https://www.nspower.ca)

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Request IR-6:

Re: Exh. N-1, p. 61.

Please provide the 5-year outage history for the existing 345 kV line connecting Nova Scotia and New Brunswick.

Response IR-6:

The unplanned outage history for L-8001, the 345 kV line between NS Power's 67N-Onslow substation and NB Power's Memramcook substation, for the period 2020-2024 YTD is provided below:

Outage Time	Sustained / Momentary	Duration (Min)	Cause
25/08/2020 22:19	Sustained	8.3	Lightning
08/01/2021 13:45	Sustained	339.4	Icing
16/01/2023 05:31	Sustained	527.8	Icing
22/07/2023 03:28	Momentary	<1	Lightning
09/03/2024 10:47	Sustained	250.0	Icing