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Request IR-1:

Reference: NS Power 2024 Load Forecast, Page 31, Line(s) 11-18

As part of the updates for 2024, the E3 scenario used in the forecast has been updated to the hybrid scenario, where a portion of customers adopting heat pumps retain their non-electric backup heating systems to provide heating on the coldest days. This assumption is in line with the Nova Scotia Power Electrification Strategy Report released in late 2023, which states ‘Winter peak impacts on the electricity system from cold-climate heat pumps can be mitigated by encouraging hybrid (mini-split) systems and best-in-class performing heat pumps.’

Within the hybrid scenario, what portion of customers adopting heat pumps with non-electric backup heating systems are assumed to retain their non-electric back-up heating system?

Response IR-1:

It is assumed that all non-electric heat customers that fall into the hybrid heat pump category retain their non-electric system as backup. Please refer to Synapse IR-07 Attachment 1 for the breakdown of portions by category.

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Request IR-2:

As part of the 2022 Evergreen IRP process, in NS Power Responses to Stakeholder

Comments: Final Evergreen IRP Modeling Results¹ NS Power stated:

NS Power has committed to further assessment of the hybrid peak scenario as part of the updated Acton Plan (Acton Plan Item 4b), which will include the assessment of the potential for the forecasted retainment of non-electric backup heating systems.

(a) Has NS Power completed any further assessment of the hybrid peak scenario before using it as an input to NS Power's heat pump assumptions?

(b) If yes, please provide the full details of this analysis including any reports and analyses conducted by NS Power or third-parties.

(c) What are the cost implications to customers of the hybrid peak mitigation strategy (i.e., retaining existing oil systems and a new heat pump system) compared to fully removing an oil system over the long-term? Please provide calculation details and analysis of the impact of such costs on the anticipated customer adoption of this hybrid approach.

(d) What are the economy-wide emissions impacts of the hybrid scenario compared to the current policy and trends scenario?

(e) If the analyses described above have not been conducted, how can NS Power be assured that this is the appropriate scenario for the load forecast?

¹ NS Power Responses to Stakeholder Comments: Final evergreen IRP Modeling Results [evergreen-IRP-Final-Modeling-Results-Summary-of-Stakeholder-Feedback-and-NSPI-Responses.pdf](https://www.nspower.ca/evergreen-IRP-Final-Modeling-Results-Summary-of-Stakeholder-Feedback-and-NSPI-Responses.pdf) (nspower.ca), page 11.

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1 Response IR-2:

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3 (a-d) Please refer to CA IR-03 for details on the current status of Action Plan item 4b the hybrid
4 peak electrification scenario assessment.

5
6 (e) NS Power's current assumptions for the hybrid peak scenario in its load forecast are aligned
7 with the load management targets outlined in the Province's 2030 Clean Power Plan. As
8 this program is developed and implemented there may be changes to program design;
9 however, the level of peak savings is expected to be consistent with those targets and so no
10 significant impact to the load forecast is expected at this time.

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Request IR-3:

Reference: NS Power 2024 Load Forecast, Page 31, Line(s) 3-5

“Heat pump usage continues to grow in the province as more customers find heat pumps an efficient way to heat and cool buildings as well as providing environmental and financial benefits.”

(a) Have any of the following heat pump performance characteristics changed in the 2024 Load Forecast compared to the 2023 Load Forecast? If yes, please describe the change and rationale for the change.

(i) COP curves

(ii) Capacity curves

(iii) Outdoor air temperature cut-off point

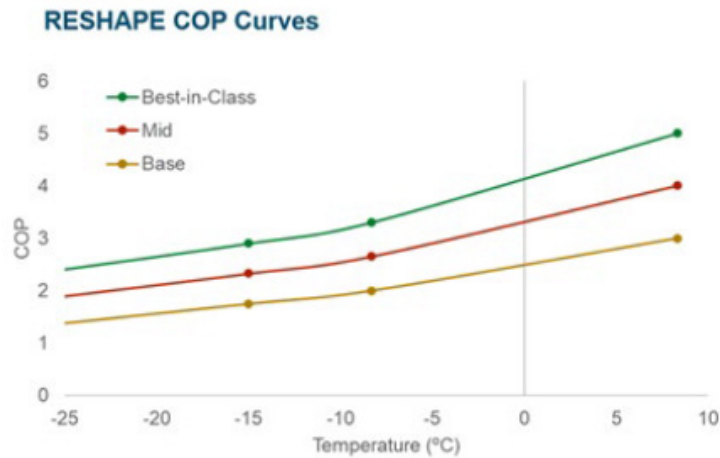
(b) In the 2023 Load Forecast Report NSPI Responses to EfficiencyOne Information Requests¹, NS Power stated:

All heat pumps are assumed to be sized to meet 93-95 percent hourly demand, and E3 assumed these heat pumps “lock out” below -7° C and only the auxiliary heating source (electric resistance) serves the load below these temperatures.

(i) Is NS Power still using this assumption in the 2024 Load Forecast?
In the same Information Request response, NS Power shared the E3 RESHAPE COP Curves which characterized heat pump COP performance between -25°C and 10°C.

¹ M11108, 2023 Load Forecast Report, NSPI Responses to EfficiencyOne Information Requests, RIR-1 to RIR-7, June 20, 2023, RIR-2, page 3 of 3.

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2
3 (ii) **With the growing prevalence of cold climate heat pumps and the RESHAPE**
4 **model data, is it not appropriate for NS Power to adopt a -15°C lockout for**
5 **heat pumps in this current and future Load Forecasts? If not, why not?**

6
7 Response IR-3:

8
9 (a)

- 10 (i-iii) The only change is regarding the outside temperature (see part b).
11

12 (b)

- 13 (i) There is no lockout assumed in the 2024 load forecast; below -7 degrees Celsius
14 both the heat pump and backup heat source will supply the heating needs.
15
16 (ii) The updated assumption that heat pumps continue to supply at least part of the
17 heating requirements below -7 degrees Celsius addresses this issue.

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Request IR-4:

Reference: NS Power 2024 Load Forecast, Page 39, Line(s) 4-7

The peak impact assumes that 70 percent of charging is managed (including direct control through EV smart charging vehicle-grid-integration controlled by a distributed energy resource management system and influenced by rates) and 30 percent of charging is unmanaged.

(a) What jurisdictions, research, or surveys were considered that suggested this might be an achievable level of managed charging given the updated forecast?

(b) Please provide the present number of electric vehicles that are enrolled in managed charging through:

(i) Time-varying pricing rates

(ii) Utility control through direct load control, subscription to an aggregator, or other means

(c) Please provide a forecast of the annual percent of managed electric vehicle charging beginning with the current level of managed charging and current time-varying pricing forecasts, and the by year increase to the anticipated achievable potential of 70% managed charging.

Response IR-4:

(a) Please refer to NSUARB IR-13 part (a).

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1 (b)

2 (i) Based on survey results that indicate approximately 8 percent of customers on the
3 TVP rates have EVs, the total number of EVs on time varying rates (including the
4 existing time of day rate) is approximately 1000.

5
6 (ii) In its 2024 Q1 DSM Report¹, E1 advised that it had recruited 46 residential
7 participants for EV telematics and EV chargers under the Eco Shift program. E1
8 also noted that enrolment in Eco Shift remains open throughout 2024, in advance
9 of the winter 2024/25 period.

10
11 (c) Charging is forecast to be 70 percent managed starting in 2024.

¹ M11727, EfficiencyOne 2024 Q1 Demand Side Management (DSM) Report, May 27, 2024, page 21.

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1 **Request IR-5:**

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3 **Reference: NS Power 2024 Load Forecast, Figure 27, Page 43**

4
5 **(a) Please provide a breakdown of Figure 27 (annual new installs and annual load) by**
6 **residential and commercial/industrial.**

7
8 **(b) If Figure 27 does not account for commercial/industrial solar net metering projects,**
9 **please provide any forecasts, assumptions and analysis regarding commercial net**
10 **metering, and describe how it has been accounted for within the 2024 Load Forecast.**

11
12 **Response IR-5:**

13
14 **(a) Please refer to Synapse IR-10 Attachment 1.**

15
16 **(b) Figure 27 does include estimates for commercial/industrial projects.**

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1 **Request IR-6:**

3 **Reference: NS Power 2024 Load Forecast, Page 36-37**

5 **The EV forecast has been updated for 2024 based on the report entitled**
6 **“Ensuring ZEV Adoption in Nova Scotia”, with a provincial vehicle sales**
7 **forecast that aligns with the federal sales targets of 20 percent by 2026, 60**
8 **percent by 2030 and 100 percent by 2035, but takes into account the fact that**
9 **the sales targets are at the national level and sales in Nova Scotia will likely lag**
10 **larger markets...**

12 **The *Ensuring ZEV Adoption in Nova Scotia*¹ provides two scenarios for EV adoption in**
13 **Nova Scotia, both of which account for some extent of provincial differentiation regardless**
14 **of whether it is the high or low scenario. On page 17 of Dunskey’s report, the high scenario**
15 **is described in this paper as an ‘upper bound’ whereas the low scenario is described as a**
16 **‘lower bound’.**

18 **(a) Please provide further context on why the lower bound was utilized in the 2024 Load**
19 **Forecast rather than of the mid-point or upper bound?**

21 **(b) What would be the impact of altering the mid-point and upper bound assumptions**
22 **on the overall energy and demand projections in the 2024 Load Forecast?**

24 **(c) Has NS Power conducted a sensitivity analysis using the EV adoption mid-point or**
25 **upper bound? If so, E1 requests these results be shared so the overall impact can be**
26 **assessed.**

28 **(d) What risks has NS Power identified concerning future system planning, if any, in**
29 **using the lower bound as opposed to the mid-point or higher bound?**

¹ Ensuring ZEV Adoption in Nova Scotia, Submitted to the Ecology Action Centre, Prepared by Dunskey Energy + Climate Advisors, March 31, 2023, https://ecologyaction.ca/sites/default/files/2023-05/RegionalZEVAdoptionOptions_Dunskey_March2023.pdf

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1 Response IR-6:

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3 (a) The existing conditions described in the Dunskey report align with the low scenario (as
4 outlined on page 18):

5
6 From this starting point, we produced a low adoption in NS scenario (Figure
7 5) that represents a more plausible version of the initial low trajectory. This
8 curve shows a possible future where adoption continues to lag in Nova
9 Scotia, corresponding with the presence of some or all factors listed under
10 “exacerbate the gap” in Table 3 (such as a very flexible federal ZEV
11 regulation and/or little additional provincial action). In this future, Nova
12 Scotia would not attain its existing target of 30% sales by 2030.
13

14 (b) Faster increases in EV sales in the province would result in increased energy and demand
15 in the forecast.
16

17 (c) This analysis has not been performed.
18

19 (d) Many inputs to the forecast have an impact on future sales and demand levels, including
20 assumptions around EV adoption. Some of the larger items are presented as scenarios in
21 Appendix D. Figure 24 in the report shows that EV uptake is expected to remain relatively
22 slow in the near term – the EV scenarios don’t start to diverge until 2027 or 2028, providing
23 time to reassess the trend from year to year and incorporate any changes in policy or
24 programs that might shorten (or lengthen) the timing of EV adoption.