1 **Q.** **Further to the response to PUB-NP-093, it is clear that the price of oil has a**
2   **substantial impact on conversions to heat pumps in Newfoundland Power's service**
3   **territory, which affects Newfoundland Power's sales forecast. Please perform an**
4   **omitted variable bias analysis of excluding the price of oil in Newfoundland Power's**
5   **forecasting model.**
6
7 A.   Newfoundland Power completed a regression analysis which included a new variable to
8   account for the price of oil (the "oil variable") on the Company's residential average use
9   model.[1] The purpose of the analysis was to determine whether the oil variable was
10   appropriate to include in Newfoundland Power's average residential energy use model,
11   and if so, to determine how much of an impact an increase in the price of oil would have
12   on residential average electricity usage.
13
14   In considering the results of the regression analysis it was determined that a positive
15   coefficient for the oil variable would be accepted for further consideration.[2] That is, the
16   oil variable coefficient would need to demonstrate that an increase in the price of oil
17   would lead to an increase in average residential energy usage.[3] A negative coefficient
18   would imply that average residential energy usage would decline when the price of oil
19   increased. Therefore, a negative coefficient would be inconsistent with the expectation
20   that customers use more electricity in response to higher oil prices.
21
22   The results of introducing the oil variable into the residential average energy use
23   regression model produces a negative coefficient for the oil variable.[4] Since this implies
24   that a higher price of oil will lead to lower average electricity usage, it was not
25   considered appropriate for the average residential energy use model. If Newfoundland
26   Power were to utilize the oil variable in its residential average energy use model, forecast
27   increases in the price of home heating oil will reduce the energy forecast for residential
28   customers. Similarly, forecast decreases in the price of home heating oil would lead to
29   higher forecast residential average use. In Newfoundland Power's view, this would not be
30   appropriate.
31
32   Aspects of the price of oil are already reflected in Newfoundland Power's residential
33   average energy use model. For example, the regression model includes a market share
34   variable which reflects the number of Newfoundland Power customers that use electric
35   heat as opposed to other forms of heating, including oil. In addition, historically the price
36   of electricity has fluctuated due to changes in the price of oil consumed at Holyrood.
37   These price fluctuations are represented in the electricity price variable used in the

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[1] The data series for the price of oil was based on the price of home heating fuel determined by the Board from 2002 to 2023. To account for prior years, the Company extrapolated the price of home heating oil based on changes in the price of West Texas Intermediate crude oil, a common benchmark for measuring fluctuations in the price of oil.

[2] In a regression analysis, the relationship between the dependent variable (average residential energy use) and the independent variable (oil variable) is estimated by regression coefficients. A residential coefficient for the oil variable explains how much average residential energy use will change due to a change in the price of oil.

[3] Effectively, customers would respond to a higher price of home heating oil by converting from oil to electric heating systems.

[4] The oil variable coefficient produced in the analysis was -2.9 with a t-statistic of -3.3.

1   residential average energy use model. The price of oil also influences provincial
2   economic activity which can also affect customer average energy use.
3
4   Other challenges associated with including the oil variable in the residential average
5   energy use model include the requirement for a reliable medium-term forecast of the
6   price of furnace oil.[5] This is dependent on global oil prices and government carbon
7   taxation policies. The recent decision of the provincial and federal government to provide
8   incentives to customers to change from oil to electric heating also poses challenges to
9   using the oil variable in the residential average energy use model.
10
11 To address increased energy consumption related to customer conversions from oil to
12 electric heating, Newfoundland Power adjusted its energy forecast to include the
13 Government of Newfoundland and Labrador's (the "Government") Oil to Electric
14 program.[6] This is due to the presumption that a customer intending to convert to electric
15 heat as a result of higher furnace oil prices would take advantage of the Government
16 funding available to lower the cost of that conversion.[7]As such, Newfoundland Power has
17 forecast oil to electric conversions in its sales forecast based on the anticipated uptake of
18 the Government's Oil to Electric program in the Company's service territory.[8]

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[5]   The price of furnace oil can fluctuate from year to year. For example, on the Avalon Peninsula in January of
      2022, 2023, and 2024 the price of furnace oil changed from $105.23, to $148.78, to $114.93, respectively.
[6]   Customer switching from oil to electric space heating was considered as part of the Newfoundland Power's and
      Hydro's Conservation Potential Study (2020-2034) completed by Dunsky Energy Consulting ("Dunsky").
      Dunsky concluded that without significant incentives, consumers are unlikely to switch from combustible
      fuel-based systems to any sort of electric heating including heat pumps. See *Conservation Potential Study,
      Final Report (Volume 1 – Results)*, page 94.
[7]   This concept is typically referred to as free ridership.
[8]   See the response to Request for Information PUB-NP-097 for Newfoundland Power's forecast residential oil
      heating to electric heating conversions for the period 2024 to 2026 and the sales forecast impact.