

Docket No. 4780
Fifth Set of Data Requests of the
Division of Public Utilities and Carriers to National Grid
January 25, 2018

Electric Heat Initiative

- 5-1. Schedule PST-1, Chapter 6 - Electric Heat, page 1 of 15 states: "The 2050 pathway envisioned by the EC4 report implies an annual conversion rate of approximately 13,000 customers per year to heat pumps every year between now and 2050."
- a. Which years will the Company run its Electric Heat Initiative?
 - b. Please provide the number of heat pump installations, per year and in total for all future years the Company can provide projections i) in the Energy Efficiency program ii) in the Electric Heat Initiative and iii) for these two efforts combined.
 - c. Please provide the percentage of the 13,000 customers per year that the Company proposes to reach with heat pumps, per year and in total i) in the Energy Efficiency program ii) in the Electric Heat Initiative and iii) for these two efforts combined.
 - d. How did the Company determine that the percentage reach proposed in the Electric Heat Initiative was most appropriate?
 - e. Did the Company examine any other percentage reach scenarios, including ones with higher or lower levels of reach?
 - f. If so, why didn't the Company propose any of these scenarios? Please provide the Company's rationale separately for each scenario it examined.
- 5-2. Schedule PST-1, Chapter 6 – Electric Heat, page 1 of 15 states: "Yet given the shortfall between that number and the vision laid out in the EC4 Plan, this Initiative dedicates additional resources to accelerate adoption of air-and ground-source heat pumps by the customers with the highest energy costs and largest emissions footprints."
- a. Does the Company plan to implement electric heat measures through the Energy Efficiency programs moving forward (i.e., past the period of approved Energy Efficiency program plans)?
 - b. What does the Company believe is the optimal approach to increase the penetration of electric heat (i.e., including, but not necessarily limited to: i) ramping up EE program investments in these measures to the extent that supplemental funding through the Electric Heat Initiative is not needed; ii) maintaining EE program investments in these measures and supplementing EE program investments in these measures through the Electric Heat Initiative; or, iii) transitioning EE program investments to the Electric Heat Initiative)? Please explain why the approach can be considered optimal.

- 5-3. Schedule PST-1, Chapter 6 – Electric Heat, page 2 of 15 states: “In order to select the ground-source heat pump site, the Company will collaborate with the PUC or its designee to identify a single building or a set of buildings, such as commercial office building or public school, to provide a ground-source heat pump heating and cooling system.” Please discuss the extent to which the Company’s list of potential facilities may be limited by:
- a. the fact that “the project will be used as a case study teaching tool for the benefit of the industry” (page 2);
 - b. the fact that some buildings may have uses and operational characteristics that are not representative of a broader building type;
 - c. cost sharing requirements for buildings that are municipally-owned; and,
 - d. any distribution system constraints in the geographic area surrounding the building.
- 5-4. Schedule PST-1, Chapter 6 – Electric Heat, page 3 of 15 states: “In the EE Program, rebates are available only to market-rate customers. In contrast, approximately 50% of the Electric Heat Initiative equipment incentive budget will be set aside for Income Eligible customers.”
- a. Please provide the number of heat pump installations per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate, residential single-family income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,
 - v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).
 - b. Please provide the average incentive per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate and residential income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,

- v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).
- c. Please provide the total incentive costs per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate and residential income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,
 - v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).
- d. Please provide the total benefits per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate and residential income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,
 - v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).
- e. Please provide the cost effectiveness ratio per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate and residential income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,
 - v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).

- f. Please provide the carbon reductions in short tons per year and in total for all future years the Company can provide projections by:
 - i. program (i.e., GSHP, Equipment Incentives, and Community-Based Incentives);
 - ii. sector (i.e., commercial, residential market-rate and residential income eligible);
 - iii. base heat fuel type (i.e., electric resistance and oil);
 - iv. base cooling; and,
 - v. measure type (i.e., air- vs. ground-source and replace-on-failure vs. early retirement).
 - g. How many Income Eligible customers exist in the Company's territory?
 - h. Please provide the number and percent of Income Eligible customers by heating fuel type.
 - i. How did the Company determine that a set aside of 50% of the equipment incentive budget for Income Eligible customers was most appropriate? What proportion of this budget will be allocated to single family versus multi-family properties?
 - j. Did the Company examine any other equipment incentive breakouts for Income Eligible and market-rate customers?
 - k. If so, why didn't the Company propose any of these breakouts? Please provide the Company's rationale separately for each breakout it examined.
- 5-5. Schedule PST-1, Chapter 6 – Electric Heat, page 3 of 15 states: “The Company will explore program options to encourage bundling of weatherization with heat pumps to maximize energy and cost savings.”
- a. When will the Company explore these program options?
 - b. How will the Company explore these program options?
 - c. Has the Company considered tiered incentives to encourage customers to implement electric energy efficiency measures and heat pumps at the same time?
 - d. Does the Company have any plans to also explore program options to encourage bundling of rooftop solar PV incentives with electric vehicle and heat pump incentives, especially in areas where the distribution system is currently constrained?
- 5-6. Schedule PST-1, Chapter 6 – Electric Heat, page 4 of 15 states: “Communities will be selected based on their ability to increase market awareness and drive adoption of heat pumps.” How will the Company determine which communities have a greater ability to increase market awareness and drive adoption of heat pumps?

- 5-7. Schedule PST-1, Chapter 6 – Electric Heat, page 4 of 15 states: “National grid staff will also participate in installer selection discussions to provide feedback and support evaluation of responses; however, it is expected that the ultimate selection of installer(s) will be determined by a community selection committee.”
- Who bears the risks if there are issues with specific contractors (i.e., customers, the community selection committee, the Company)?
 - What is the process for resolving any contractor issues that customers experience? Please explain the roles and responsibilities of each of the key parties (i.e., customers, the community selection committee, the Company)?
 - The 2018 Energy Efficiency Plan also includes Community-Based Initiatives. Please explain the similarities and differences between the contractor management process in the Community-Based Outreach program within the Electric Heat Initiative and in the Community-Based Initiatives within the 2018 Energy Efficiency Plan. Please provide the rationale behind any differences.
- 5-8. Schedule PST-1, Chapter 6 – Electric Heat, pages 6 and 7 of 15 features Table 6.1: High-Level Summary of Alignment between Electric Heat Initiative and Docket 4600 Goals. In Table 6.1, the Company notes a neutral impact for one of the “Goals for New Electric System” described as “Appropriately charge customers for the cost they impose on the grid.”
- Please explain the Company’s understanding of what this description means, specifically as it relates to the Electric Heat Initiative.
 - Please explain the Company’s characterization of the impact of the Electric Heat Initiative as “neutral.”
 - Is it appropriate for the Company to consider offering customers that participate in the Electric Heat Initiative different rate designs?
 - If so, what rate design(s) can help achieve this goal?
- 5-9. Schedule PST-1, Chapter 6 – Electric Heat, pages 6 and 7 of 15 features Table 6.1: High-Level Summary of Alignment between Electric Heat Initiative and Docket 4600 Goals. In Table 6.1, the Company notes a neutral impact for one of the “Goals for New Electric System” described as “Appropriately compensate the distribution utility for the services it provides”.
- Please explain the Company’s understanding of what this description means, specifically as it relates to the Electric Heat Initiative.
 - Please explain the Company’s characterization of the impact of the Electric Heat Initiative as “neutral.”
 - Please define “appropriate compensation.”

- d. Can utility performance incentives be characterized as a form of ‘appropriate compensation’?
 - e. Does the Company propose to earn a rate of return on any of its capital investments in the Electric Heat Initiative?
 - f. If so, which capital investments?
 - g. If so, what rate of return is the Company proposing for each investment?
- 5-10. Schedule PST-1, Chapter 6 – Electric Heat, page 7 of 15 states: “In December 2016, with GHG emissions reductions in mind, the Rhode Island EC4 Plan argued the need for rapid thermal market transformation. Undertaken in accordance with the provisions of Rhode Island General Laws §42-6.2-2(2), the EC4 Plan includes strategies, programs, and actions to meet the targets for GHG emissions reductions as established in the Resilient Rhode Island Act. The EC4 Plan carried out scenario modeling to illuminate pathways for the State to meet its GHG emissions reduction targets. The resulting scenarios suggested that unprecedented levels of heat pump adoption would be required to achieve the state’s 2050 targets: 81% of residential and 67% of commercial heating load.” What percent of residential and commercial heating load does the heat pump adoption in this proposal achieve, by year and in total?
- 5-11. Schedule PST-1, Chapter 6 – Electric Heat, page 8 of 15 states: “The Electric Heat Initiative directly responds to all of these policy proposals, expands the role for third parties, and provides a platform for technology innovation that allows for adaptive experimentation and bolsters a competitive third-party ecosystem of heat electrification with the intent to achieve market scale.”
- a. Please explain how the Electric Heat Initiative “expands the role for third parties”.
 - b. Please define the term “third parties” in this context.
 - c. Please explain how the electric heat initiative “bolsters a competitive third-party ecosystem of heat electrification”.
- 5-12. Schedule PST-1, Chapter 6 – Electric Heat, page 9 of 15 features Table 6.2: Costs by Program.
- a. Please provide table for each program that breaks out costs by year and in total for: i) program administration costs, ii) marketing costs, iii) customer incentive costs, iv) technical assistance costs, v) evaluation, measurement and verification costs, vi) participant costs, and vii) utility shareholder incentives.
 - b. Please provide a similar table for the electric heating efforts included in the 2018 Energy Efficiency Plan.
- 5-13. Schedule PST-1, Chapter 6 – Electric Heat, page 11 of 15 states, “For market-rate customers, incentive levels will be approximately 20% of the all-in cost of heating capacity”.
- a. What are the participant costs by measure for market-rate customers?

- b. Will market-rate customers be able to finance these costs?
 - c. If so, which financing mechanisms are available to these customers?
- 5-14. Schedule PST-1, Chapter 6 – Electric Heat, page 11 of 15 states, “Total incentives per customer system will be capped at five tons for cold-climate air-source heat pump and four tons for ground-source heat pump”.
 - a. What is the rationale behind these specific caps?
 - b. Please provide an estimate of the percent of homes that would be uneconomic to serve, considering that homes larger than 1,800 square feet would only be eligible for a partial conversion and the Company stated on this page that partial conversions are not typically economic.
- 5-15. Schedule PST-1, Chapter 6 – Electric Heat, page 12 of 15 features Table 6-4: Societal Cost Test Benefits and Costs.
 - a. Please provide the cost-effectiveness by measure type (air- vs. ground-source and replace-on-failure) for the GSHP Program.
 - b. Please provide the cost-effectiveness by sector (commercial, residential Income Eligible and residential market-rate), and measure type (air- vs. ground-source and replace-on-failure) for the Equipment Incentives Program.
 - c. Please provide the cost-effectiveness by sector and measure type (air- vs. ground-source and replace-on-failure) for the Community-Based Marketing Program.
 - d. Please provide the cost-effectiveness for the Oil dealer training and support program.
- 5-16. How many customers is the Company planning to convert to natural gas in years covered by this initiative?
- 5-17. What additional targeting and segmentation approaches will you use to tier incentives and prioritize Equipment Incentive Program offerings to customers that are in most need or most likely to make the investment? Have you considered whether a customer that is interested in an electric vehicle may also be interested in a heat pump?
- 5-18. Does the Company’s load forecasting incorporate increases in electricity use due to the Electric Heat Initiative? If so, how? If not, why not?
- 5-19. Why doesn’t the Electric Heating Initiative provide supplemental funding to reach a greater proportion of the new construction market with heat pump technology, as is proposed for retrofits in collaboration with the Energy Efficiency Programs?
- 5-20. Does the Company plan to offer heat pumps that are demand-response enabled? Please explain.
- 5-21. Schedule PST-2, Appendix 10.10, 8.0 Electric Heat Initiative, R.I.P.U.C. No. 2205, Sheet 8, states, “The Electric Heat Factor (“EHF”) is designed to recover the Company’s investment in ground heat exchangers constructed, owned, and operated by the Company,

any ongoing O&M expense on such ground heat exchangers, plus expenses associated with the other elements under the Company's EH Initiative as identified below." Please provide the Company's investment broken out by program, measure type (i.e., air- vs. ground-source) and cost type (i.e., capitalized cost, municipal property taxes and O&M costs).

- 5-22. Schedule PST-2, Appendix A, R.I.P.U.C. No. 2205, Sheet 16, Electric Heat Program shows that performance incentives for this program are lower than for many other distributed energy resources. Please explain why this is the case.
- 5-23. Please indicate whether the Company has any policies or initiatives designed to encourage gas heating conversions and explain such policies. If such policies exist, please provide copies of any such policies or materials used in those initiative. How does the Company plan on coordinating programs on the electric side of the business that are designed to encourage the installation of electric heat pumps with objectives to convert customers to natural gas?
- 5-24. Referring to the response to DIV 4-19 in Docket 4770, please provide an itemized list of the projects and/or initiatives that result in the estimated capital expenditures identified for each of the years for "Gas Growth" in the chart.