COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 24-25

DIRECT PRE-FILED JOINT TESTIMONY OF

SHIRA HOROWITZ

AND

THEODORE POE, JR.

ON BEHALF OF
BOSTON GAS COMPANY D/B/A NATIONAL GRID

EXHIBIT NG-FORECAST-1

February 9, 2024

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SHIRA HOROWTIZ AND THEODORE POE, JR.

I. INTRODUCTION

Shira Horowitz

Q. Dr. Horowitz, please state your name and business address.

A. My name is Shira Horowitz. My business address is 170 Data Drive, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am employed by National Grid USA Service Company ("NGSC") as Director, Load Forecasting & Analytics. I oversee the gas and electric load forecasts for National Grid.

Q. Please summarize your educational background and professional experience.

A. I have been in my current position with NGSC since May 2021 where I oversaw gas load forecasting for National Grid. In June 2022, I added the responsibility of overseeing National Grid's electric load forecasting. Before that, from June 2019 through April 2021, I was the Manager of Economics and Load Forecasting at National Grid. Prior to joining National Grid, I worked at Consolidated Edison in New York and PJM Interconnection in Pennsylvania. I received a Bachelor of Engineering in Electrical Engineering from The Cooper Union in New York and a Doctor of Philosophy in Engineering and Public Policy from Carnegie Mellon University in Pennsylvania. I also completed a Fulbright Fellowship in Sustainable Power Generation in Stockholm, Sweden.

Q. Have you previously testified before the Department or any other regulatory commissions?

A. Yes, I recently testified before the Department of Public Utilities ("Department") in the Company's Capital Investment Projects ("CIPs") in Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid, D.P.U. 22-170, Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid, D.P.U. 23-06, Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid, D.P.U. 23-09, and Massachusetts Electric Company and Nantucket Electric Company each d/b/a National Grid, D.P.U. 23-12. I have also testified several times before the Rhode Island Public Utilities Commission.

Theodore Poe, Jr.

Q. Mr. Poe, please state your name and business address.

A. My name is Theodore Poe, Jr. My business address is 170 Data Drive, Waltham, Massachusetts 02451.

Q. By whom are you employed and in what capacity?

A. I am Manager, Gas Load Forecasting for NGSC. In this position, I am responsible for the preparation of the forecast of the resource requirements for Boston Gas.

Q. Please summarize your educational background and professional experience.

A. I graduated from the Massachusetts Institute of Technology in 1978 with a Bachelor of Science degree in Geology. From 1981 to 1989, I worked as a Research Associate with Jensen Associates, Inc. of Boston, where I was responsible for developing a variety of computer-forecasting models to analyze natural gas supply

and demand for interstate pipeline and local gas distribution companies. I joined Boston Gas Company in 1989, where I was responsible for modeling and forecasting customers' natural gas resource requirements and managing the resource planning process. In 1998-99, I assumed the same responsibilities for Essex Gas Company and Colonial Gas Company. In 2000, I assumed responsibility for modeling and forecasting the natural gas resource requirements of The Brooklyn Union Gas Company and KeySpan Gas East Corporation. In 2008, I assumed responsibility for modeling and forecasting the natural gas resource requirements for National Grid in Rhode Island and New York.

Q. Have you previously testified before the Department or any other regulatory commissions?

A. Yes. I testified before the Department in previous Forecast and Supply Plan ("F&SP") filings in D.P.U. 13-01, D.P.U. 15-036, and D.P.U. 16-181, and supported the F&SP filings in D.P.U. 18-148, D.P.U. 20-132, and D.P.U. 22-149. In addition, I have testified in numerous proceedings before the Department regarding gas resource contracting. I have also testified in numerous proceedings before the Rhode Island Public Utilities Commission and the New Hampshire Public Utilities Commission.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of our testimony is to provide an analysis of the Company's resource requirements, which indicates a need for the resource described in the Testimony of Ms. Elizabeth D. Arangio, Ms. Faye Brown, Ms. Samara A. Jaffe, Mr. Michael

J. Pini, and Ms. Deborah M. Whitney, Exhibit NG-Agreement-1. As discussed below, the need analysis that we have prepared supports the Company's decision to enter into arrangements with Constellation LNG, LLC ("Constellation"). As described in more detail in Exhibit NG-Agreement-1, the Company has contracted for LNG liquid and/or vapor from Constellation in order to serve existing customer load and forecasted incremental load for firm sales and capacity-eligible customers (the "Agreement").

II. SYSTEM PLANNING AND FORECASTING

Q. Would you please describe the Company's process for system planning?

A. The Company's core obligation is to provide safe, reliable and least-cost gas service to all customers within its service territory. To meet this obligation, the Company employs a multi-disciplined planning process that is designed to quantify existing and future load requirements and to ensure that sufficient gas supply and gas distribution resources are available to serve that load on a safe and reliable basis. Thus, the principal areas of focus in determining "system need" for incremental gas supply and capacity resources are the evaluation of: (1) whether there is sufficient gas supply available to the Company to serve customer demand; and (2) whether there is sufficient transportation and storage capacity available to deliver that gas to customers on the peak hour, peak day, and over the peak season. For the Company, reliable service to customers cannot be maintained unless identified needs are addressed in each of these areas.

Q. What is the Company's process for forecasting customer load requirements?

A. In accordance with Department precedent, the Company develops the forecast of customer requirements for the long-range resource plans based on a ten-year planning horizon. The Company updates the ten-year forecast set forth in the long-range resource plans on an annual basis to refine the prior long-range forecast and to prepare a forecast for the subsequent ten-year planning horizon.

The Company has relied on the methodology approved in D.P.U. 20-132 to prepare the updated forecast associated with this filing. At the time that the forecast supporting the proposed Agreement was prepared, the forecast and supply plan approved in D.P.U. 20-132 was the Company's most recently approved forecast and supply plan.

Using the methodology approved in D.P.U. 20-132, the Company develops the forecast of customer requirements under design weather planning conditions using a five-step process, which involves:

(1) determining the annual retail demand expected for residential heating, residential non-heating and commercial/industrial heating and commercial/industrial non-heating markets over the forecast period for both sales and transportation services using a series of econometric models at the quarterly level;

(2) reducing the forecasted retail demand by the impact expected to be achieved through the implementation of its Energy Efficiency programs as

well as anticipated electrification of heat initiatives and the impact of Boston's Building Emissions Reduction and Disclosure Ordinance ("BERDO") which sets requirements for large existing buildings to reduce their greenhouse gas emissions over time, because these reductions are exogenous to the demand forecast generated by the econometric models;

(3) converting the monthly retail demand forecast to a normalized forecast of daily customer requirements;

(4) establishing its design-day and design-year planning standards; and

(5) specifying the forecasted daily customer requirements under design weather conditions.

Q. How does the Company establish and use its planning standards?

A. In Step 4 of the forecasting process, the Company establishes appropriate planning standards, which set forth the defined weather conditions and consequent sendout requirements that must be met by the Company's resource portfolio throughout the year in order to ensure reliable service to customers. In essence, the planning standards dictate the amount and type of resources that the Company must have available to serve customers during periods of peak demand. For purposes of the long-range resource plan, the Company establishes a design-day standard and a design-year standard, consistent with the Department's requirements. However, the Company must also monitor and remediate any constraints on pipeline deliveries to the Company's take stations under design weather conditions to ensure

that the Company has reserved sufficient capacity rights to maintain hourly flows at the level required to meet sendout requirements.

The Company uses the design-day standard to establish the amount of *system-wide throughput* (i.e., interstate pipeline and vaporization capacity) that must be available to the system on the peak day. The design-year standard identifies the amount of *gas supply* that will be required over the design year to provide continuous service to customers under all design weather conditions. Through the interaction of these two standards, the Company is able to ensure that sufficient pipeline and vaporization capacity is available on the design day and that there is adequate gas supply, flowing and in storage (underground storage and LNG), to provide reliable service throughout the design year.

Q. Did the Company perform a forecast analysis using the methodology discussed?

A. Yes. The Company performed a forecast analysis using the methodology discussed above and approved by the Department for the long-range resource plans. Specifically, the Company developed both load requirements and resource requirements from 2022/2023 through the length of the Agreement. To establish the load requirement, the Company developed a monthly retail demand forecast under normal weather assumptions. The Company then converted this retail forecast to a daily normalized forecast of customer requirements over the ten-year forecast period. Using its approved design-day and design-year weather-planning standards, the Company then determined the design-year sendout requirements and the design-day (peak-day) sendout requirements over the forecast period.

In preparing its forecast, the Company assumed load reductions due to Energy Efficiency consistent with the Company's most-recent Three-Year Plan through 2024. Beyond 2024, the Company assumes that the energy efficiency programs continue, however at a slower incremental rate since gas HVAC efficiency measures will no longer be permitted. Electrification of heat is assumed to be consistent with the 2022 – 2024 Energy Efficiency Plan, and continues beyond that at similar growth rates for the rest of the forecast period. Additionally, the Company adjusted its forecast for the impact of emissions reductions from large existing buildings as per Boston's BERDO. One final adjustment to the Company's forecast of supply requirements was made to address anticipated migration of capacity-exempt customers to the Company's sales service, which qualifies those customers as capacity-eligible and part of the Company's planning load from that point forward. Since the winter of 2013/14, a number of capacity-exempt customers have opted to become capacity-eligible, and the Company continues to expect that trend to continue into the future.

To model the conversion from capacity-exempt to capacity-eligible, the Company used the three-year average of conversions that occurred from capacity-exempt to capacity-eligible from November 2020 through June 2023. This most recent data implied an incremental design day load of 3,219 Dth/day. The Company then assigned that amount of conversion to the Boston Gas service territory and added that to its forecasted Sales and Customer Choice customer requirements to reflect this migration for the 2023/24 planning year. The Company assumes that this trend

continues as similar rates for the remainder of the planning horizon. For the normal year, the returned capacity-exempt load added to the Sales and Customer Choice forecast was 445 BBtu/year in 2022/23, growing to 3,563 BBtu/year in 2029/30, or an average annual growth of 445 BBtu per year. In comparison, the Company's capacity-eligible normal year load (excluding the returning capacity-exempt load) is projected to grow by 12,526 BBtu over the period from 2022/23 to 2029/30, or an average annual growth of 1,789 BBtu per year.

For the design year, the returned capacity-exempt load added to the Sales and Customer Choice forecast was 493 BBtu/year in 2022/23, growing to 3,948 BBtu/year in 2029/30. For the design day, the returned capacity-exempt load added to the Sales and Customer Choice forecast was 3 BBtu/day in 2023/24, growing to 26BBtu/day in 2029/30.

The load requirement net of these adjustments is the input to the SENDOUT® model to determine resource requirements.

Q. How is this demand forecast compared to the demand forecast in the D.P.U.22-149 Supply Plan?

A. In the D.P.U. 22-149 Supply Plan (2022 LRP), the Company's forecast reflected the continued recovery from the impacts of the COVID-19 pandemic and the price advantage that natural gas continued to hold over heating oil. With the Company's 2023 annual update to its forecast, the Company's current forecast is lower, both in terms of its design day and its normal year annual volumes (Table 1). Had the Company's forecast remained at the level of its 2022 LRP, its need for the Agreement would have been greater.

Table 1

	Design Day (Dth)		Normal Year (Dth)	
	2022 LRP Forecast	2023 Forecast	2022 LRP Forecast	2023 Forecast
2023/24	1,468,291	1,387,042	139,567,594	131,941,644
2024/25	1,514,012	1,425,286	143,046,877	135,058,174
2025/26	1,534,822	1,464,746	144,978,299	138,698,239
2026/27	1,555,047	1,500,105	146,855,797	141,592,398
2027/28	1,575,336	1,518,088	148,682,771	143,981,003
2028/29	1,593,787	1,535,670	150,208,426	144,983,561
2029/30	1,605,440	1,547,304	151,395,698	146,239,635

Q. How is this demand forecast then used in planning the Company's gas distribution system?

A. From the Company's design day forecast, the Company calculates its design hour requirements to support its distribution system planning. The Company maintains a Design Hour (the peak hour on a Design Day) planning criteria for planning purposes to determine the level of supply and pressure needed to deliver gas without interruption when demand is highest – typically during the early morning hours (when customers generally turn up the thermostat and use gas for hot water/cooking), on days that meet the Design Day criteria. The Design Hour criteria is five percent of the Design Day. The Design Hour criteria determines the level of deliverability capacity to and from city gate stations as well as on-system supply resources during the hour of the day when maximum gas is consumed as customers turn up their thermostats, cook, and use gas for hot water heating.

The Company also models the disaggregation of its design day forecast from the system level (e.g., Boston, Essex, Lowell, Cape) down to the zip code level in each of the four service territories to better inform its distribution system planning of the spatial distribution of forecasted increases (or decreases) in its design day forecast (Testimony of Ms. Elizabeth D. Arangio, Ms. Faye Brown, Ms. Samara A. Jaffe, Michael J. Pini, and Ms. Deborah M. Whitney, Exhibit NG-Agreement-1 at Sec. V).

III. CONCLUSION

Q. Does this conclude your pre-filed testimony in this proceeding?

A. Yes. It does.