Docket No. DE 18-073
Exhibit No. 2

STATE OF NEW HAMPSHIRE
BEFORE THE PUBLIC UTILITIES COMMISSION

Public Service Company of New Hampshire
Reconciliation of Energy Service and Stranded Costs for
Calendar Year 2017

DIRECT TESTIMONY OF
FREDERICK B. WHITE

I. INTRODUCTION

Q. Please state your name.

A. My name is Frederick B. White.

Q. Mr. White, please provide your business address and title.

A. My business address is 107 Selden St, Berlin, Connecticut. I am a Supervisor in the Electric Supply department of Eversource Energy.

Q. Mr. White, please describe your responsibilities at Eversource Energy.

A. I supervise and provide analytical support required to fulfill the power supply requirement obligations of Public Service of New Hampshire, d/b/a Eversource Energy ("Eversource" or the "Company"). This included, prior to the divestiture of Eversource's generation fleet, supporting the development of default Energy Service (at times referred to herein as "ES") rates, evaluation of the need to supplement Eversource's resources for the provision of energy service, and acquisition of Financial Transmission Rights ("FTR") to manage congestion. Subsequent to the divestiture, this involves conducting solicitations for the competitive procurement of power for energy service and the fulfillment of Renewable Portfolio Standards ("RPS") obligations. I am also responsible for on-going activities associated with independent power producers and purchase power agreements.

II. PURPOSE

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to report on how Eversource's generation resources and supplemental purchases were used to meet energy and capacity requirements during the period January 1, 2017 through December 31, 2017. As a load-serving entity, Eversource is responsible for having sufficient energy to meet the hourly needs of its customers and is also responsible for its share of the ISO-NE capacity requirement. Eversource is also the default provider of service to customers who for any reason are otherwise without a service provider. Eversource meets its requirements through its owned generation, PURPA-mandated purchases under short term rates and long-term rate orders, power purchase agreements, and through supplemental purchases of energy and capacity from the market. I will also discuss Eversource's participation in the FTR auction process.

III. ENERGY REQUIREMENTS

Q. Please summarize the generation resources that were available to meet Eversource's energy requirements during the period January 1, 2017 through December 31, 2017.

A. Attachment FBW-1 lists the resource portfolio Eversource used to meet its customers' energy requirements in 2017. As shown on that Attachment, available energy resource capacity during this time period was about 1,207 MW for the summer months. These values are based on ISO-NE seasonal claimed capability ratings. The portfolio was comprised of the following resource groups: hydroelectric (48 MW from nine stations), coal and biomass (576 MW from Merrimack and Schiller Stations), gas/oil (419 MW from Newington and Wyman 4), combustion turbines (83 MW from five units), biomass (67.5 MW from Burgess Biopower), wind (3 MW from Lempster), and non-utility generation (10.8 MW from numerous PURPA-mandated purchases).

Q. Please summarize how Eversource's resources met energy requirements during 2017.

A. Attachment FBW-2 summarizes how energy requirements were met and how Eversource's generation resources were utilized by month during peak and off-peak

periods. During 2017, 47% of peak energy requirements and 52% of off-peak energy requirements were met with the generation resources listed on FBW-1. The remaining energy needs were met through bilateral or spot market energy purchases.

Q. Were Eversource's must-take resources and economic generation sufficient to meet energy requirements in every month?

A. No. Eversource's resources did not meet its customers' energy requirements in all hours and, therefore, Eversource purchased a portion of its customers' needs. The purchase requirement changed hourly and ranged from zero to a significant portion, depending on the availability of resources, the level of demand, the migration of customers to competitive energy service options, and the relative economics of Eversource's generation versus purchase alternatives.

Q. Please summarize how supplemental purchases were used to meet energy requirements.

A. Attachment FBW-3 summarizes the purchases made to supplement Eversource's generating resources. Approximately 927 GWh of peak energy were purchased at an average cost of $40.38 per MWh (a total expense of $37.4 million). 93 GWh were purchased bilaterally at an average cost of $37.51 per MWh (a total expense of $3.5 million). All 93 GWh of bilateral purchases were procured via fixed-price monthly contracts to address forecasted supplemental requirements and planned unit outages. The remaining 834 GWh of peak energy were procured via the ISO-NE hourly spot market at an average cost of $40.70 per MWh (a total expense of $34.0 million). (Figures may not add due to rounding.)

Approximately 808 GWh of off-peak energy were purchased at an average cost of $32.32 per MWh (a total expense of $26.1 million). None were purchased bilaterally. All GWh of off-peak energy were procured via the ISO-NE hourly spot market. The combined expense for all supplemental energy purchases was $63.6 million.

Q. Were there any hours in which Eversource's supply resources exceeded energy needs?

A. Yes. Attachment FBW-3 also summarizes the hours in which supply resources, including supplemental bilateral purchases, exceeded energy requirements resulting in sales to the ISO-NE spot market. Approximately 33 GWh of peak energy were sold at an average price of $47.88 per MWh (total revenues of $1.6 million). In addition, approximately 32 GWh of off-peak energy were sold at an average price of $83.28 per MWh (total revenues of $2.6 million). The combined revenue for all surplus energy sales was $4.2 million.

Q. Please summarize how commodity prices (oil, natural gas, and energy) varied during 2017.

A. Attachment FBW-4 is a chart of the 2017 daily prices for crude oil (West Texas Intermediate), natural gas (delivered to Algonquin Gate), and bilateral energy (peak hours at the Massachusetts Hub). The chart shows the range of commodity and energy market prices in 2017. The chart also shows the continuing correlation between natural gas prices and energy purchase prices in New England. Note the natural gas price spikes during winter months, due to space heating demand and delivery constraints on the natural gas transportation pipeline system.

Q. Please summarize the impact of commodity market volatility on the cost of serving Eversource's energy requirement.

A. During 2017, 40% of energy requirements were met with coal, wood, and hydro resources. Newington is capable of operating on either residual fuel oil or natural gas, whichever is the more economic fuel. Because of the fuel diversity of Eversource's supply portfolio, Eversource was largely insulated from volatility in the natural gas market. During periods of high and volatile natural gas prices Eversource's resource mix provided price stability, and during periods of low natural gas prices load can be served through low priced market purchases while Eversource's resources provided insurance against price increases.

IV. CAPACITY REQUIREMENTS

Q. Please describe the net benefit to Eversource's customers associated with the Forward Capacity Market during 2017.

A. Attachment FBW-5 summarizes Eversource's monthly capacity market activity. Over the course of the year capacity market revenues from generation resources (including owned assets, non-utility IPPs, and the Hydro-Quebec Interconnection Capacity Credits) exceeded capacity market expenses, resulting in a net revenue and credit to Energy Service customers of $16.2 million.

Q. Please summarize the ISO-NE capacity market rules that were in effect during 2017.

A. The capacity market in New England is governed by the Forward Capacity Market ("FCM") rules as administered by ISO-NE. ISO-NE conducts Forward Capacity Auctions ("FCA"), into which capacity resources offer MWs, to "procure" the lowest cost resources necessary to meet the ISO-NE Installed Capacity Requirement and to establish the market value of capacity. The capacity prices established for 2017 were $3.15/kW-month for the January to May period, and $7.025/kW-month for the June to December period. Additional components of the FCM which occur after the FCAs, including Reconfiguration Auctions and monthly Peak Energy Rent adjustments, result in adjustments to Capacity Supply Obligations, the overall rate paid to capacity, and the rate paid by load for capacity. Generally, resources are paid for providing capacity, and the total payments for capacity resources in each month are charged to ISO-NE load serving entities based on their relative share of the prior year's peak demand.

Q. Please summarize the supply resources that were used to meet Eversource's capacity requirements.

A. During 2017, a total of 418,729 MW-months of capacity qualified for credits in the ISO-NE capacity market (this equates to a monthly average of 34,894 MWs). Eversource was allocated 2.94% (12,329 MW-months) of this capacity obligation. Eversource's supply resources had capacity supply obligations of 16,342 MW-months of capacity; comprised of owned generation (13,707 MW-months), non-utility IPPs (1,214 MW-months, including Burgess Biopower and Lempster Wind),

and Hydro-Quebec Interconnection Capacity Credits (1,421 MW-months). For 2017, Eversource had a net capacity surplus of 4,013 MW-months. (Figures may not add due to rounding.) Attachment FBW-5 provides additional details.

Q. Can you estimate the Energy Service ("ES") customers' capacity credit associated with Eversource's owned generation resources during 2017?

A. Yes. As noted above, for 2017, owned resources provided 13,707 MW-months of capacity to ISO-NE. This created $71.2 million in revenue credited to the Energy Service rate.

V. FINANCIAL TRANSMISSION RIGHTS

Q. What is a Financial Transmission Right?

A. An FTR is a financial instrument available to participants seeking to manage congestion cost risk or those wishing to speculate on the difference in congestion costs between two locations. These instruments have been available since the introduction of the ISO-NE Standard Market Design. All FTRs are defined by a MW amount, a source location, and a sink location (e.g. a participant may own 100 MW of FTRs that are sourced at the Merrimack node and sink at the New Hampshire load zone). For each MW of FTR, the owner will receive a credit or a charge from ISO-NE equal to the difference in the congestion component of the hourly LMP between the sink and the source. If the sink location congestion price exceeds the source location price, the FTR will have a positive value, i.e. - a credit to that participant's ISO-NE settlement in that hour. Similarly, if the sink location price is less than the source location price, the owner will be charged the difference.

Q. Please summarize Eversource's participation in the ISO-NE FTR auction process.

A. Eversource participated in these auctions as a method of hedging the congestion price differential between the major fossil stations (Merrimack and Schiller) and the New Hampshire load zone for periods and in quantities according to forecasted unit operation. Eversource also procured FTRs to hedge the differential between the source location of bilateral purchases (e.g. the Massachusetts Hub and Burgess Biopower) and the New Hampshire load zone. Generation resources and bilateral

purchases provide an effective hedge against the energy component of the zonal LMP, but they do not guard against a congestion component differential. Therefore, even in an hour in which Eversource had sufficient resources to serve its energy requirement, it would be exposed to potential congestion charges. The purpose of acquiring FTRs is to convert the risk associated with a variable, unknown expense (i.e. the hour-by-hour difference in the applicable LMP congestion component), to a fixed, known expense (i.e. the cost of the FTR); however, not at any cost. The prices bid to acquire FTRs are evaluated against potential congestion cost exposure to achieve a balance between risk coverage and minimizing costs for ES customers. During 2017, Eversource acquired via auction 674 GWh of FTRs for a net cost of $832,038. Settlement of the FTRs resulted in elimination of $1,502,651 of congestion charges. Thus, managing a portion of congestion cost risk with FTRs resulted in an overall decrease in Energy Service expense of $670,613.

Q. Will Eversource continue to participate in the FTR auction process in order to hedge against unpredictable congestion costs?

A. Eversource has utilized FTRs to manage congestion risk between its resource locations and the New Hampshire load zone where energy service load is located. To the extent resources are divested, and load obligations are met by wholesale suppliers, the need for FTRs no longer exists. During 2017 congestion was managed with FTRs as it has been for the past many years. In early 2018 the use of FTRs was phased out as divestiture of Eversource's fossil steam units was accomplished and wholesale supply for energy service was implemented.

Q. Does that complete your testimony?

A. Yes, it does.