Docket No. DE 16-xxx
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 2015

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 primarily 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"). This includes the development of default energy service rates, evaluation of the need to supplement Eversource's resources for the provision of energy service, and acquisition of Financial Transmission Rights to manage congestion. I participate in ISO-NE stakeholder meetings and monitor ISO-NE, NEPOOL, and FERC activities to ensure that our operations are up to date. I am also responsible for on-going activities associated with independent power producers and certain 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, 2015 through December 31, 2015. 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, 2015 through December 31, 2015.

A. Attachment FBW-1 lists the resource portfolio Eversource used to meet its customers' energy requirements in 2015. As shown on that Attachment, available energy resource capacity during this time period was about 1,225 MW for the summer months. These values are based on ISO-NE seasonal claimed capability ratings (except for Bio Energy which is an energy only contract not rated by ISO-NE). The portfolio is comprised of the following resource groups: hydroelectric (49 MW from nine stations), coal and biomass (574 MW from Merrimack and Schiller Stations), gas/oil (419 MW from Newington and Wyman 4), combustion turbines (82 MW from five units), biomass (67.5 MW from Burgess Biopower), wind (2 MW from Lempster), and non-utility generation (21 MW from numerous PURPA-mandated purchases and 10 MW from one IPP buyout replacement contract, which terminated in June, 2015).

Q. Please summarize how Eversource's resources met energy requirements during 2015.

A. Attachment FBW-2 summarizes how energy requirements were met and how Eversources's generation resources were utilized by month during peak and off-peak periods. During 2015, 52% of peak energy requirements and 57% 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 1,059 GWh of peak energy were purchased at an average cost of $40.73 per MWh (a total expense of $43.1 million). 305 GWh were purchased bilaterally at an average cost of $37.48 per MWh (a total expense of $11.4 million). Of that, 224 GWh were procured via fixed-price monthly contracts to address forecasted supplemental requirements and planned unit outages, and 81 GWh were procured via fixed-price shorter term arrangements (e.g. daily, weekly) to address unplanned outages and higher load periods. The remaining 754 GWh of peak energy were procured via the ISO-NE hourly spot market at an average cost of $42.04 per MWh (a total expense of $31.7 million). (Figures may not add due to rounding.)

Approximately 872 GWh of off-peak energy were purchased at an average cost of $29.67 per MWh (a total expense of $25.9 million). 29 GWh were purchased bilaterally at an average cost of $33.39 per MWh (a total expense of $1.0 million), procured via fixed-price shorter term arrangements (e.g. daily, weekly) to address unplanned outages and higher load periods. The remaining approximately 843 GWh of off-peak energy were procured via the ISO-NE hourly spot market at an average cost of $29.54 per MWh (a total expense of $24.9 million). The combined

expense for all supplemental energy purchases was $69.0 million. (Figures may not add due to rounding.)

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 51 GWh of peak energy were sold at an average price of $134.45 per MWh (total revenues of $6.9 million). In addition, approximately 98 GWh of off-peak energy were sold at an average price of $101.93 per MWh (total revenues of $10.0 million). The combined revenue for all surplus energy sales was $16.9 million.

Q. Please summarize how commodity prices (oil, natural gas, and energy) varied during 2015.

A. Attachment FBW-4 is a chart of the 2015 daily prices for crude oil (West Texas Intermediate), natural gas (delivered to Algonquin Gate), and bilateral energy (peak hours at the Mass. Hub). The chart shows the range of commodity and energy market prices in 2015. The chart also shows the continuing correlation between natural gas prices and energy purchase prices in New England. Note also the dramatic natural gas price spikes during winter months, due to space heating demand and delivery constraints on the natural gas transportation pipeline system, with the price frequently exceeding the price of oil.

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

A. During 2015, 46% 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 is largely insulated from volatility in the natural gas market. During periods of high and volatile natural gas prices Eversource's resource mix provides price stability, and during periods of low natural gas prices load can be served through low priced market purchases while Eversource's resources provide insurance against price increases.

IV. CAPACITY REQUIREMENTS

Q. Please describe the cost impact to Eversource's customers associated with the Forward Capacity Market during 2015.

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 ES customers of $4.8 million.

Q. Please summarize the ISO-NE capacity market rules that were in effect during 2015.

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 2015 were $3.21/kW-month for the January to May period, and $3.43/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 2015, a total of 411,304 MW-months of capacity qualified for credits in the ISO-NE capacity market (this equates to a monthly average of 34,275 MWs). Eversource was allocated 3.45% (14,192 MW-months) of this capacity obligation. Eversource's supply resources had capacity supply obligations of 15,686 MW-months of capacity; comprised of owned generation (13,173 MW-months), non-utility IPPs (1,195 MW-months, including Burgess Biopower and Lempster Wind),

and Hydro-Quebec Interconnection Capacity Credits (1,318 MW-months). For 2015, Eversource had a net capacity surplus of 1,494 MW-months. (Figures may not add due to rounding.) Attachment FBW-5 provides additional details.

Q. Can you estimate the ES customers' capacity credit associated with Eversource's owned generation resources during 2015?

A. Yes. As noted above, for 2015, owned resources provided 13,173 MW-months of capacity to ISO-NE. This created $41.3 million in revenue credited to the Energy Service rate.

V. FINANCIAL TRANSMISSION RIGHTS

Q. What is a Financial Transmission Right (FTR)?

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 2015, Eversource acquired via auction 815 GWh of FTRs for a net cost of $197,876. Settlement of the FTRs resulted in $781,321 of congestion charges. Thus, managing a portion of congestion cost risk with FTRs resulted in an overall increase in Energy Service expense of $979,197. This result was due primarily to significant reverse congestion during August between the Schiller generator nodes and the NH Load Zone.

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

A. Yes. FTRs serve as an insurance policy against unanticipated congestion costs. Eversource procures FTRs primarily to provide cost certainty and thus reduce risk, rather than to achieve savings. If Eversource did not purchase FTRs and there was a problem on the system that resulted in congestion, the cost could be several times the cost of the FTR. Therefore, it makes sense to continue to purchase FTRs when able to do so at reasonable cost to manage the exposure to congestion costs.

Q. Does that complete your testimony?

A. Yes, it does.