

March 1, 2017

Mr. Robert Stein, Chairman  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051

Re: CL&P dba Eversource Energy Forecast of Loads & Resources for the Period 2017-2026

Dear Mr. Stein:

The Connecticut Light and Power Company dba Eversource Energy (the "Company") submits herewith 15 copies of the Company's 2017 Forecast of Loads and Resources, as required by Connecticut General Statute 16-50r.

Please do not hesitate to contact me if you have any questions regarding this filing.

Sincerely,

Christopher R. Bernard  
Manager, Regulatory Policy & Strategy – CT  
As Agent for The Connecticut Light & Power Company  
dba Eversource Energy

Enclosure



# **2017 Forecast of Loads and Resources**

for the Period 2017-2026

March 1, 2017

## List of Acronyms

“ACEEE”	American Council for an Energy Efficiency Economy
“C&LM”	Conservation and Load Management
“CAGR”	Compound Annual Growth Rate
“CAM”	Cost Adjustment Mechanism
“CEAB”	Connecticut Energy Advisory Board
“CES”	Comprehensive Energy Strategy
“CSC”	Connecticut Siting Council
“CMEEC”	Connecticut Municipal Electric Energy Cooperative, Inc.
“DEEP”	Department of Energy and Environmental Protection
“DOE”	Department of Energy
“DPUC”	Department of Public Utility Control
“DG”	Distributed Generation
“EEB”	Energy Efficiency Board
“EDC”	Electric Distribution Company
“EIS”	Environmental Impact Statement
“EV”	Electric Vehicles
“FCA”	ISO-NE Forward Capacity Auction
“FCM”	ISO-NE Forward Capacity Market
“FERC”	Federal Energy Regulatory Commission
“FLR”	Forecast of Loads and Resources
“GHCC”	Greater Hartford/Central Connecticut
“GW”	Gigawatt or 1,000,000,000 Watts
“HVDC”	High Voltage Direct Current
“IPR”	Intermittent Power Resource
“IRP”	Integrated Resource Plan
“ISD”	In-Service Date
“ISO-NE”	Independent System Operator – New England
“KV”	Kilovolt or 1,000 Volts
“KW”	Kilowatt or 1,000 Watts
“LDC”	Local Distribution Companies
“LREC”	Low Emission Renewable Energy Credits
“MRA”	Market Resource Alternative
“MW”	Megawatt or 1,000,000 Watts
“NERC”	North American Electric Reliability Corporation

## List of Acronyms, Continued

“NHPUC”	New Hampshire Public Utility Commission
“NH SEC”	New Hampshire Site Evaluation Committee
“NPCC”	Northeast Power Coordinating Council
“NPT”	Northern Pass Transmission Project
“OATT”	Open-Access Transmission Tariff
“PA 11-80”	Public Act 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection (“DEEP”)
“PAC”	Planning Advisory Committee
“PSNH”	Public Service Company of New Hampshire
“PURA”	Public Utility Regulatory Authority
“REC”	Renewable Energy Certificate
“RGGI”	Regional Greenhouse Gas Initiative
“RPS”	Renewable Portfolio Standards
“RSP”	ISO-NE’s Regional System Plan
“SWCT”	ISO-NE Southwest Connecticut Zone
“SWCT WG”	The Southwest Connecticut Working Group
“TO”	Transmission Owner
“UI”	The United Illuminating Company
“WMECO”	Western Massachusetts Electric Company
“ZREC”	Zero Emission Renewable Energy Credit

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## Chapter 1: INTRODUCTION

### 1.1 Overview of Eversource's 2016 Forecast of Loads and Resources ("FLR") Report

The Connecticut Light & Power Company doing business as Eversource Energy ("Eversource" or the "Company") is a company engaged in electric distribution and transmission services in Connecticut, as defined in Conn. Gen. Stat. §16-1. As such, Eversource has prepared this Ten-Year FLR pursuant to Conn. Gen. Stat. §16-50r. Eversource has provided an annual FLR to the Connecticut Siting Council ("CSC") for over forty years. This 2017 FLR includes the following information<sup>1</sup>:

1. A tabulation of the peak loads, resources, and margins for each of the next ten years, using CL&P's 50/50 financial forecasting methodology.
2. Data on energy use and peak loads for the five preceding calendar years, including data on the energy savings provided by Eversource's energy efficiency programs during that period.
3. A list of planned transmission lines on which proposed route reviews are being undertaken or for which certificate applications have already been filed.

### 1.2 Energy and Peak Demand Forecasts

There is uncertainty in any forecast, and weather can especially have a large impact on the realization of any forecast. Eversource's electric energy usage is expected to decrease by a weather-normalized Compound Annual Growth Rate ("CAGR") of 0.8% per year, and peak demand is expected to decline by a weather-normalized CAGR of 0.2% per year over the 10-year forecast period from 2017 through 2026.

While Eversource is providing this forecast which was developed for financial forecasting purposes, Eversource uses Independent System Operator – New England's ("ISO-NE") load forecast for transmission planning purposes. Further discussion of Eversource's forecast is provided in Chapter 2.

### 1.3 Evolving Load and Resource Influences

As part of the state's restructuring of the electric industry, which began in 1998, Eversource sold its generation assets, while remaining a Connecticut electric distribution and transmission company. Since that time, the state has enacted a number of policies and programs which affect the developing wholesale electric market in the region.

## State-Mandated Integrated Resource Planning

In 2007, the Connecticut legislature passed PA 07-242, *An Act Concerning Electricity and Energy Efficiency*, directing the annual development of an IRP for Connecticut. In 2011, the Connecticut legislature passed PA 11-80, *An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future*. PA 11-80 calls for DEEP to create an IRP by January 1, 2012 and biennially thereafter,

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<sup>1</sup> Pursuant to discussions with CSC staff, Eversource has removed the previously provided Table 2-3: Existing Customer Owned Facilities 1 MW and Above Providing Generation to the Eversource System from this filing.

in consultation with Connecticut Energy Advisory Board (“CEAB”)<sup>2</sup> and the Electric Distribution Companies (“EDCs”).

On March 17, 2015, DEEP issued its 2014 Integrated Resource Plan (“IRP”) for Connecticut presenting a comprehensive plan for improving Connecticut's electric energy future.

## **ISO-NE Wholesale Electric Markets**

Section 2.2 of this report discusses the results of the most recent forward capacity auction in the (“ISO-NE”) wholesale electricity market.

## **Energy Efficiency Programs**

For many years, Eversource has been developing and implementing nationally recognized Energy Efficiency programs for its customers to help them control their energy usage, save money and reduce overall electric consumption in the state. These successful programs are primarily funded by a per kWh energy efficiency charge on customer bills, as well as revenues received from Regional Greenhouse Gas Initiative (“RGGI”) auctions and revenue from the ISO New England Forward Capacity Market.

The Department of Energy and Environmental Protection (“DEEP”) approved the 2016-18 Conservation & Load Management (“C&LM”) Plan in December 2015 which included increased funding consistent with Public Act 13-298. The Three Year Plan included an electric budget of approximately \$602 million and a natural gas budget of approximately \$162 million. This is expected to generate approximately 1,242 GWh of electric savings. Currently, Eversource is on track to reach the goals outlined in the Plan. Further discussion of Eversource's energy efficiency program forecast can be found in Chapter 3.

## **Transmission Planning**

Eversource plans, builds and operates transmission infrastructure with a goal of safely and reliably delivering power to its customers under a wide variety of supply and demand conditions. A discussion of Eversource's transmission forecast can be found in Chapter 4. The key topics include:

- Eversource's transmission facilities are part of the New England regional grid and must be designed, operated and maintained to ensure compliance with mandatory North American Electric Reliability Corporation (“NERC”) reliability standards.
- Eversource is proposing new 115-kV transmission projects to strengthen the Connecticut transmission system.
- The New England transmission system is an important enabler of competitive markets and the region's efforts to meet environmental objectives and mandates.

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<sup>2</sup> The CEAB was dissolved as of June 6, 2014. See General Statutes § 16a-3, repealed by Public Act 14-94, § 82.

## Chapter 2: FORECAST OF LOADS AND RESOURCES

### Chapter Highlights

- Electric energy usage is expected to decrease by 0.8% per year over the 10-year forecast period; however, peak demand is expected to decrease by 0.2% per year during this time.
- While Eversource uses its own Reference Plan Forecast for financial forecasting, it uses ISO-NE's load forecast for transmission planning purposes.

### 2.1 Electric Energy and Peak Demand Forecast

The energy and peak demand forecasts contained in this chapter are based on the Company's budget forecast, which was prepared in August 2016, and are based on Eversource's total franchise area. The base case or 50/50<sup>3</sup> case is also referred to as the Reference Plan Forecast. Eversource's Reference Plan *Energy* Forecast is based on the results of econometric models, adjusted for Eversource's forecasted energy efficiency programs and projected reductions resulting from solar installations.

The Reference Plan *Peak Demand* Forecast is also based on an econometric model that uses energy as a trend variable which means reductions for energy efficiency programs and solar installations are implicitly included. The results of the econometric model are adjusted for projected reductions due to ISO-NE's load response program.

The Reference Plan Forecast is used for Eversource's financial planning, but it is not used for distribution or transmission planning. As ISO-NE is responsible for regional transmission planning and reliability, it independently develops its own forecast which the Company utilizes to plan and construct its transmission system. Section 2.1.3 discusses ISO-NE's forecast in general terms and how it conceptually compares to Eversource's forecast.

The Reference Plan *Energy* Forecast projects a *decrease* in the weather-normalized CAGR for total electrical energy output requirements of 0.8% for Eversource from 2017-2026. Without the Company's energy efficiency programs or solar installations, the forecasted energy growth rate is projected to be an *increase* in the weather-normalized CAGR of 0.1%.

The change in the weather-normalized CAGR for summer peak demand in the Reference Plan *Peak Demand* Forecast is forecasted to decrease by 0.2% over the ten-year forecast period. Similarly, if Eversource's Energy Efficiency and solar installations, along with the ISO-NE load

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<sup>3</sup> A "50/50 forecast" is a forecast that is developed such that the probability that actual demand is higher or lower than the forecasted amount is 50%.



response programs were excluded, the increase in the CAGR for forecasted peak demand would be 0.3%.

Table 2-1 provides historic output and summer peaks, actual and normalized for weather, for the 2012-2016 period, and forecast output and peaks for the 2017-2026 periods. The sum of the budgeted class sales for each year, adjusted for losses, is the annual forecast of system electrical energy requirements or output. This is the amount of energy that must be supplied by generating plants to serve the loads on the distribution system.

The Reference Plan Forecast is a 50/50 forecast that assumes normal weather throughout the year, with normal peak-producing weather episodes in each season. The forecasted 24-hour mean daily temperature for the summer peak day is 82° F and is based on the average peak day temperatures from 1986-2015. The Reference Plan Forecast's summer peak day is assumed to occur in July, since this is the most common month of occurrence historically. It should be noted, however, that the summer peak has occurred in June, August and September in some years.

### **2.1.1 Uncertainty in the Reference Plan Forecast**

There is uncertainty in any long-run forecast, because assumptions that are used in the forecast are selected at a point in time. The particular point of time chosen is generally insignificant, unless the forecast drivers are at a turning point. Outlined below are five major areas of uncertainty that are inherent to this forecast:

- **The Economy** - The Reference Plan Forecast is based on an economic forecast that was developed in July 2016. Business cycles represent normal economic fluctuations which are typically not reflected in long-run trend forecasts because recovery eventually follows recession, although it is difficult to pinpoint when. So while the level of energy or peak demand that is forecasted for any given year of the forecast may be attained a little earlier or later than projected, the underlying trend is still likely to occur at some point and needs to be planned for.
- **Solar Installations** - This forecast includes explicit reductions to electrical energy output requirements due to solar installations stemming from the currently active Low Emission Renewable Energy Credits ("LREC") / Zero Emission Renewable Energy Credits ("ZREC") program and the Connecticut Green Bank residential program.
- **Electric Prices** - This forecast assumes that total average electric prices will increase slightly through 2019 and then remain fairly stable throughout the remainder of the forecast period.
- **Electric Vehicles ("EVs")** - This forecast includes explicit additions to electrical energy output requirements due to EVs. It does not include any additions to the peak forecast since it assumed that the majority of the charging will be done off-peak.
- **Weather** - The Reference Plan Forecast assumes normal weather based on a thirty-year average (1986 - 2015) of heating and cooling degree days. The historical peak day 24- hour mean temperatures range from 74° F to 89° F, with deviations from the average peak day temperatures being random, recurring and unpredictable occurrences. For example, the lowest peak day mean temperature occurred in 2000, while the highest occurred in 2011. This variability of peak-producing weather means that over the forecast period, there will be years when the actual peaks will be significantly above or below the forecasted peaks.

Despite the inherent risks outlined above, the Company believes its current forecast to be the best possible, given the information available today.

## 2.1.2 Forecast Scenarios

Table 2-1 contains scenarios demonstrating the variability of peak load around the 50/50 peak forecast due to weather. The table shows that weather has a significant impact on the peak load forecast with variability of approximately 8%, or 400 Megawatts ("MWs"), above and below Eversource's 50/50 forecast, which is based on normal weather. To illustrate, the 2026 summer peak forecast reflecting average peak-producing weather is 4,833 MWs. However, either extremely mild or extremely hot weather could result in a range of potential peak loads from 4,476 MWs to 5,254 MWs. This 800 MWs of variation, which is a band of approximately plus or minus 8% around the average, demonstrates the potential impact of weather alone on forecasted summer peak demand.

The Extreme Hot Weather scenario roughly corresponds conceptually to ISO-NE's 90/10 forecast, described in Section 2.1.3.

**Table 2-1: Eversource 2017 Reference Plan Forecast**

Year	Net Electrical Energy Output Requirements		Reference Plan (50/50 Case)			Extreme Hot Scenario			Extreme Cool Scenario		
	Output GWh (1)	Annual Change (%)	Peak MW	Annual Change (%)	Load Factor (2)	Peak MW	Annual Change (%)	Load Factor (2)	Peak MW	Annual Change (%)	Load Factor (2)
<b>HISTORY</b>											
2012	23235		5280		0.501						
2013	23447	0.9%	5448	3.2%	0.491						
2014	23041	-1.7%	4772	-12.4%	0.551						
2015	23047	0.0%	4850	1.6%	0.543						
2016	22460	-2.5%	4948	2.0%	0.517						
<b>Compound Rates of Growth (2012-2016)</b>											
		-0.8%		-1.6%							
<b>HISTORY NORMALIZED FOR WEATHER</b>											
2012	23200		5039		0.524						
2013	23275	0.3%	5202	3.2%	0.511						
2014	22992	-1.2%	5002	-3.8%	0.525						
2015	22811	-0.8%	5034	0.6%	0.517						
2016	22242	-2.5%	4953	-1.6%	0.511						
<b>Compound Rates of Growth (2012-2016)</b>											
		-1.0%		-0.4%							
<b>FORECAST</b>											
2017	22528	1.3%	5033	1.6%	0.511	5454	10.1%	0.472	4675	-5.6%	0.550
2018	22188	-1.5%	4990	-0.9%	0.508	5411	-0.8%	0.468	4633	-0.9%	0.547
2019	21850	-1.5%	4959	-0.6%	0.503	5380	-0.6%	0.464	4602	-0.7%	0.542
2020	21801	-0.2%	4953	-0.1%	0.501	5373	-0.1%	0.462	4595	-0.1%	0.540
2021	21618	-0.8%	4939	-0.3%	0.500	5360	-0.2%	0.460	4582	-0.3%	0.539
2022	21409	-1.0%	4915	-0.5%	0.497	5336	-0.5%	0.458	4557	-0.5%	0.536
2023	21196	-1.0%	4894	-0.4%	0.494	5315	-0.4%	0.455	4537	-0.5%	0.533
2024	21046	-0.7%	4874	-0.4%	0.492	5294	-0.4%	0.453	4516	-0.5%	0.531
2025	20775	-1.3%	4853	-0.4%	0.489	5274	-0.4%	0.450	4496	-0.5%	0.528
2026	20570	-1.0%	4833	-0.4%	0.486	5254	-0.4%	0.447	4476	-0.4%	0.525
<b>Compound Rates of Growth (2016-2026)</b>											
		-0.9%		-0.2%		0.6%			-1.1%		
<b>Normalized Compound Rates of Growth (2016-2026)</b>											
		-0.8%		-0.2%		0.6%			-1.1%		

1. Sales plus losses.

2. Load Factor = Output (MWh) / (8760 Hours X Season Peak (MW)).

Forecasted Reference Plan Peaks are based on normal peak day weather (82° mean daily temperature). Forecasted High Peaks are based on the weather that occurred on the 2011 peak day (89° mean daily temperature). Forecasted Low Peaks are based on the weather that occurred on the 2000 peak day (74° mean daily temperature).

### 2.1.3 ISO-NE Demand Forecasts

The Connecticut Siting Council's ("CSC") 2008 Review of the Ten-Year Forecast of Loads and Resources provides a concise description of the ISO-NE's "90/10" forecast used by Eversource for transmission planning purposes. A relevant excerpt is provided below.

Called the "90/10" forecast, it is separate from the normal weather (50/50) forecasts offered by the Connecticut utilities. However, it is the one used by both ISO-NE and by the Connecticut utilities for utility infrastructure planning, including transmission and generation.

The 90/10 forecast is a plausible worst-case hot weather scenario. It means there is only a 10 percent chance that the projected peak load would be exceeded in a given year, while the odds are 90 percent that it would not be exceeded in a given year. Put another way, the forecast would be exceeded, on average, only once every ten years. While this projection is extremely conservative, it is reasonable for facility planning because of the potentially severe disruptive consequences of inadequate facilities: brownouts, blackouts, damage to equipment, and other failures. State utility planners must be conservative in estimating risk because they cannot afford the alternative.

Just as bank planners should ensure the health of the financial system by maintaining sufficient collateral to meet worst-case liquidity risks, load forecasters must ensure the reliability of the electric system by maintaining adequate facilities to meet peak loads in worst-case weather conditions. While over-forecasting can have economic penalties due to excessive and/or unnecessary expenditures on infrastructure, the consequences of under-forecasting can be much more serious. Accordingly, the Council will base its analysis in this review on the ISO-NE 90/10 forecast.

As Eversource has reported in the past, there is one other major difference between the Eversource and ISO-NE forecasts, aside from the difference between the 50/50 forecast methodology used by Eversource and the 90/10 forecast methodology used by ISO-NE. The Eversource demand forecasts include explicit reductions in the energy forecast for the Company's C&LM programs and solar resources and explicit reductions in the peak demand forecast for ISO-NE's Load Response program, while the ISO-NE demand forecasts do not include these reductions; instead, ISO-NE considers C&LM, Load Response and large scale solar to be supply resources in their capacity forecast. ISO-NE has developed a new photovoltaic ("PV") forecast such that small scale solar is calculated and explicitly reduces the ISO-NE demand forecast. ISO-NE publishes the PV forecast annually as part of their load forecast documentation.

Table 2-2 shows Eversource's Reference Plan Forecast with savings from Eversource's C&LM programs, distributed generation ("DG") and ISO-NE's Load Response program added back in to make it easier to compare Eversource's forecast with ISO-NE's forecast.

**Table 2-2: Adjustments to Output and Summer Peak Forecasts**

Net Electrical Energy Output Requirements (GWH)						
<u>Year</u>	<u>Unadjusted</u> <u>Output</u>	<u>Solar</u>	<u>Company</u> <u>Energy</u> <u>Efficiency</u>	<u>ISO-NE</u> <u>Load</u> <u>Response</u>	<u>Adjusted</u> <u>Output</u>	<u>Annual</u> <u>Change</u> <u>(%)</u>
<b>HISTORY NORMALIZED FOR WEATHER</b>						
2016					22,242	
<b>FORECAST</b>						
2017	22,638	(75)	(34)	-	22,528	1.3%
2018	22,575	(263)	(125)	-	22,188	-1.5%
2019	22,487	(419)	(219)	-	21,850	-1.5%
2020	22,623	(521)	(302)	-	21,801	-0.2%
2021	22,627	(625)	(384)	-	21,618	-0.8%
2022	22,598	(723)	(467)	-	21,409	-1.0%
2023	22,564	(818)	(549)	-	21,196	-1.0%
2024	22,592	(914)	(632)	-	21,046	-0.7%
2025	22,499	(1,010)	(715)	-	20,775	-1.3%
2026	22,473	(1,106)	(797)	-	20,570	-1.0%
<b>Normalized Compound Rates of Growth (2016-2026)</b>						
	0.1%				-0.8%	

50/50 Reference Plan (MW)						
<u>Year</u>	<u>Unadjusted</u> <u>Peak</u>	<u>Solar</u>	<u>Company</u> <u>Energy</u> <u>Efficiency</u>	<u>ISO-NE</u> <u>Load</u> <u>Response</u>	<u>Adjusted</u> <u>Peak</u>	<u>Annual</u> <u>Change</u> <u>(%)</u>
<b>HISTORY NORMALIZED FOR WEATHER</b>						
2016					4,953	
<b>FORECAST</b>						
2017	5,138	(6)	(3)	(95)	5,033	1.6%
2018	5,118	(22)	(11)	(95)	4,990	-0.9%
2019	5,109	(36)	(19)	(95)	4,959	-0.6%
2020	5,118	(45)	(26)	(95)	4,953	-0.1%
2021	5,121	(53)	(33)	(95)	4,939	-0.3%
2022	5,112	(62)	(40)	(95)	4,915	-0.5%
2023	5,106	(70)	(47)	(95)	4,894	-0.4%
2024	5,101	(78)	(54)	(95)	4,874	-0.4%
2025	5,096	(86)	(61)	(95)	4,853	-0.4%
2026	5,091	(95)	(68)	(95)	4,833	-0.4%
<b>Normalized Compound Rates of Growth (2016-2026)</b>						
	0.3%				-0.2%	

Extreme Hot Weather Scenario (MW)						
<u>Year</u>	<u>Unadjusted</u> <u>Peak</u>	<u>Solar</u>	<u>Company</u> <u>Energy</u> <u>Efficiency</u>	<u>ISO-NE</u> <u>Load</u> <u>Response</u>	<u>Adjusted</u> <u>Peak</u>	<u>Annual</u> <u>Change</u> <u>(%)</u>
<b>HISTORY NORMALIZED FOR WEATHER</b>						
2016					4,953	
<b>FORECAST</b>						
2017	5,558	(6)	(3)	(95)	5,454	10.1%
2018	5,539	(22)	(11)	(95)	5,411	-0.8%
2019	5,530	(36)	(19)	(95)	5,380	-0.6%
2020	5,539	(45)	(26)	(95)	5,373	-0.1%
2021	5,541	(53)	(33)	(95)	5,360	-0.2%
2022	5,533	(62)	(40)	(95)	5,336	-0.5%
2023	5,527	(70)	(47)	(95)	5,315	-0.4%
2024	5,522	(78)	(54)	(95)	5,294	-0.4%
2025	5,517	(86)	(61)	(95)	5,274	-0.4%
2026	5,512	(95)	(68)	(95)	5,254	-0.4%
<b>Normalized Compound Rates of Growth (2016-2026)</b>						
	1.1%				0.6%	

## 2.2 *ISO-NE Wholesale Electric Markets*

This section reports on the most recent ISO-NE forward capacity auction.

The eleventh forward capacity auction (“FCA”) took place on Monday, February 6, 2017. Information about FCA 11 has been taken from the majority of the ISO-NE press release, which can be found at the following location:

[http://www.iso-ne.com/static-assets/documents/2016/02/20160211\\_fca10\\_initialresults\\_final.pdf](http://www.iso-ne.com/static-assets/documents/2016/02/20160211_fca10_initialresults_final.pdf)

**Holyoke, MA—February 9, 2017**—New England’s annual capacity auction concluded Monday with sufficient resources to meet demand in 2020-2021. Preliminary results indicate the clearing price was the lowest since 2013. The auction is run by ISO New England Inc. to procure the resources that will be needed to meet projected demand three years in the future.

The eleventh (FCM) auction (FCA #11) closed at a preliminary, system-wide clearing price of \$5.30 per kilowatt-month (KW-month), compared to \$7.03/kW-month in the previous auction for New England Resources. No major generators retired in FCA # 11 and no large new generators cleared in the auction, but 640 megawatts (MW) of new energy-efficiency and demand-reduction measures, the equivalent of a large power plan, cleared and will be available in 2020-2021.

FCA #11 began with significant competition among resources to provide reliability services in New England. Resources totaling 40,463 MW, including 34,505 MW of existing capacity and 150 new resources totaling 5,958 MW, competed to provide the capacity target of 34,075 MW. Forecasted demand reductions from the ISO’s forecast of behind-the-meter solar PV growth reduced the capacity target by 720 MW.

This year’s auction concluded with commitments from 35,835 MW to be available in 2020-2021, with 1,760 MW of surplus capacity. The auction rules allow the region to acquire more or less than the capacity target, providing flexibility to acquire additional capacity and enhanced reliability at a cost-effective price.

“The chief purpose of a capacity market— resource adequacy — was achieved through a competitive process that balances the needs of consumers and suppliers. The auction concluded at the lowest price that is still enough to keep the most efficient resources in business,” said Robert Ethier, vice president of market operations at ISO New England. “The lower clearing price and surplus capacity are indicative of a market that works. In previous auctions, a supply shortfall pushed up prices after more than 3,000 MW of resources announced their retirements in 2013; the higher prices have attracted new competition, which has helped lower prices while keeping the lights on in New England.”

For FCA #11, the region was divided into three zones: Northern New England, including Vermont, New Hampshire, and Maine; Southeast New England, including Northeastern Massachusetts, Greater Boston, and the former

Southeastern Massachusetts and Rhode Island zone; and Rest of Pool, including Connecticut and western and central Massachusetts.

## **Preliminary results of FCA #11:**

- The auction closed for most resources after six rounds of competitive bidding at \$5.30/kW-month, the lowest clearing price since the floor price was eliminated in the 2013 auction. The clearing price will be paid to all resources in all three capacity zones in New England and 1,035 MW of imports from New York and Quebec. Imports from New Brunswick, totaling 200 MW, will receive \$3.38/kW-month.

- Previous clearing prices (all per kilowatt-month): FCA #7 (2013), \$3.15 floor price, except \$14.99 for new resources in NEMA/Boston; FCA #8 (2014), \$15 new and \$7.025 existing; FCA #9 (2015), \$9.55 system-wide except SEMA/RI: \$17.73 and \$11.08 existing; FCA #10 (2016), \$7.03.

- At \$5.30/kW-month, the total value of the capacity market in 2020-2021 will be approximately \$2.4 billion.

- About 35,835 MW of capacity cleared the auction to meet the 34,075 MW net installed capacity target for 2020-2021.

- 31,389 MW of generation, including 264MW new, in the form of increased generating capability added at existing power plants

- 3,211 MW of demand resources, including 640 MW that is new

- 1,235 MW of imports from New York, and Quebec and New Brunswick, Canada

- Six megawatts of new wind and five megawatts of new solar resources cleared the auction; in all, 137 MW of wind and 66 MW of solar facilities cleared FCA #11 (most PV resources in New England are on the distribution system and don't participate in the wholesale markets).

- No large resources retired in FCA 11; a few small oil generators delisted during the auction, meaning they've dropped out of the capacity market for one year, but can sell energy during that time and can compete again in future auctions.

## Chapter 3: ENERGY EFFICIENCY

### Chapter Highlights

- Energy savings resulting from Connecticut Energy Efficiency Fund programs are a cost-effective resource available to Connecticut customers by reducing customer bills and helping to mitigate peak energy prices.
- Connecticut Energy Efficiency Fund programs are recognized nationally and provide economic development benefits to the State.
- The 2016-18 C&LM Plan is expected to generate \$1.39 billion in economic benefit to Connecticut.

### ***CL&P 2016 - 2018 Conservation and Load Management Plan***

Energy efficiency is a cost-effective resource available to policymakers to address rising energy costs, reliability challenges, and greenhouse gas reduction. Efficiency and load response programs in Connecticut reduce the amount of energy homes, businesses and schools consume, helping to decrease demand for energy from power plants, reducing the harmful emissions those power plants produce, and reducing consumer energy bills in all sectors. Energy efficiency programs also provide economic development benefits for Connecticut and help mitigate winter peak energy prices resulting from natural gas pipeline constraint during winter high-use periods.

In 2011, Public Act 11-80, *An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future Efficiency*, was passed which laid the groundwork for pursuing all cost effective energy efficiencies. In 2013, Public Act 13-298, *An Act Concerning Implementation of Connecticut's Comprehensive Strategy and Various Revision to the Energy Statutes*, provided the framework for increased conservation spending in Connecticut for electric and natural gas conservation programs. On December 22, 2015, DEEP approved the 2016 – 2018 Conservation and Load Management Plan (“Three Year Plan”) submitted by the Connecticut electric and gas utility companies on October 1, 2015.<sup>4</sup> The C&LM Plan was based upon input from members of the public, industry groups and private enterprise, and was developed in collaboration with the Energy Efficiency Board (“EEB”). The Plan included unprecedented levels of funding for both electric and natural gas energy efficiency programs based on Public Act 13-298.

The Three Year Plan includes an electric budget of approximately \$602 million and a natural gas budget of approximately \$162 million. The former is expected to generate approximately 1,242 GWh of electric savings and a combined (electric and gas program) net economic benefit of \$1.39 billion to Connecticut customers. The Three Year Plan builds upon the momentum of the 2013-15 C&LM Plan by

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<sup>4</sup> DEEP, Public Act 11-80 – Section 33 – 2016-2018 Conservation and Load Management Plan submitted by The Connecticut Light and Power Company, The United Illuminating Company, Yankee Gas Services Company, Connecticut Natural Gas Corporation, Southern Connecticut Gas Company.

continuing efforts to improve upon existing energy-saving programs, including upstream and midstream initiatives; customer segmentation; customer engagement tools; strategic energy management; business energy sustainability; Home Energy Solutions program enhancements; lighting technologies and behavioral-based programs.

Funding for C&LM programs currently comes from several sources. Since the passage of the state's restructuring legislation in 1999, a 3 mil electric charge has served as the primary funding source.<sup>5</sup> Public Act 11-80 and the subsequent DEEP approval of the Plan provide an additional 3 mil Conservation Adjustment Mechanism charge for conservation. In addition, C&LM programs receive funding from other sources including the ISO-NE's FCM, Class III renewable energy revenues, and RGGI.

Connecticut is a nationally recognized leader in implementing high-quality energy-efficiency programs. Since 2000, the American Council for an Energy Efficiency Economy ("ACEEE") has ranked Connecticut as one of the top states for energy efficiency. In the ACEEE's *2014 State Energy Efficiency Scorecard*, Connecticut ranked sixth in the nation. This ranking reflects the success of Connecticut's energy efficiency programs.

Eversource with guidance from the EEB, maintain their conservation and load management programs' success through an evolving, integrated approach that reaches out to customers in their homes, at their jobs, in schools and in the community. Through seminars, workshops, teacher training, museum partnerships, trade and professional affiliations, retail partnerships and marketing, Eversource is helping to shape a more efficiency-minded consumer that not only participates in award-winning programs, but makes wiser energy choices every day.

### **3.1 Ten-Year C&LM Forecast**

Table 3-1 presents the potential cumulative annualized energy savings and summer and winter peak-load reductions forecasted for C&LM programs implemented in the CL&P service territory for the C&LM Plan budget. The forecast is based on anticipated savings from the 2016-2018 C&LM Plan. Forecasted savings beyond 2018 assumes similar programs, budgets and savings as anticipated in 2018. However, savings in years 2019 and beyond reflect anticipated changes in energy efficiency budgets and production costs.

### **3.2 Forecast Sensitivity**

The C&LM programs utilize a complementary mix of lost opportunity, retrofit, and market transformation implementation strategies to achieve savings. The energy savings and peak-load reductions projected in this forecast are sensitive to changes in a number of factors including changes in the electricity marketplace and consumer attitudes. In particular, the impact of federal policy on lighting standards is unclear at this point and may impact future savings.

This forecast does not include potential savings from Public Act 15-107 Section (b) *An Act Concerning Affordable and reliable Energy*. Currently Eversource has been selected to provide additional energy efficiency resources and is in the process of negotiating final terms of contract. The most significant variable in determining energy savings is the stability of funding. Projections are based on the continued implementation of a suite of programs similar in nature and focus to the C&LM Plan and expected future funding as described above. Any additional legislative or regulatory changes in geographic and program focus will produce results that may vary from these projections.

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<sup>5</sup> Conn. Gen. Stat. § 16-245m.



<b>Table 3-1</b>											
CL&P C&LM Programs Annual Energy Savings											
and											
Peak Load Reduction by Customer Class											
Connecticut Light and Power											
2017-2026											
GWh Sales Saved											
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Residential	113	254	381	458	523	578	624	662	692	716	
Commercial	148	317	469	611	743	866	980	1,086	1,185	1,277	
Industrial	44	95	141	183	223	260	294	326	355	383	
<b>Total</b>	<b>306</b>	<b>666</b>	<b>991</b>	<b>1,252</b>	<b>1,489</b>	<b>1,704</b>	<b>1,898</b>	<b>2,074</b>	<b>2,233</b>	<b>2,376</b>	
MW Reductions (Passive Resource Summer Impacts)											
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Residential	17	39	59	70	79	86	93	98	103	107	
Commercial (non-Load Response))	20	43	63	82	100	116	131	146	159	171	
Industrial (non-Load Response)	6	13	19	25	30	35	39	44	48	51	
<b>Total</b>	<b>43</b>	<b>94</b>	<b>141</b>	<b>176</b>	<b>208</b>	<b>237</b>	<b>264</b>	<b>288</b>	<b>310</b>	<b>329</b>	
MW Reductions (Passive Resource Winter Impacts)											
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Residential	24	55	82	99	115	128	139	149	158	165	
Commercial (non-Load Response))	23	48	71	92	112	130	147	163	178	192	
Industrial (non-Load Response)	7	14	21	28	33	39	44	49	53	57	
<b>Total</b>	<b>54</b>	<b>117</b>	<b>174</b>	<b>219</b>	<b>260</b>	<b>297</b>	<b>330</b>	<b>361</b>	<b>389</b>	<b>414</b>	

Notes:

- 1) This table includes only passive resources. It does not include 47.5 MW of Load Response demand savings (active resources) which Eversource maintains through the ISO-NE program.
- 2) Total savings assumes that all measures will continue to provide savings throughout the forecast period.

## **Chapter 4: TRANSMISSION PLANNING AND SYSTEM NEEDS**

### **4.1 Transmission is planned and built for the long term**

Transmission systems enable varying amounts and sources of generation to serve load over a long term. The addition of significant amounts of remote renewable generating capacity or the retirement of local generation may increase the need to import or export power to or from Connecticut, and the transmission system may need to be expanded. Transmission system additions are proposed and built to accommodate the future, considering many scenarios.

### **4.2 Transmission Planning and National Reliability Standards**

Eversource's transmission facilities are part of the New England regional grid and must be designed, operated and maintained to ensure compliance with mandatory NERC and Northeast Power Coordinating Council ("NPCC") reliability standards and criteria.

On March 15, 2007, the Federal Energy Regulatory Commission ("FERC") approved mandatory reliability standards developed by NERC. FERC believes these standards will form the basis to maintain and improve the reliability of the North American bulk power system. These mandatory reliability standards apply to users, owners and operators of the bulk power system, as designated by NERC through its compliance registry procedures. Both monetary and non-monetary penalties may be imposed for violations of the standards. The final rule, "Mandatory Reliability Standards for the Bulk Power System," became effective on June 18, 2007. Since then, many of the standards have undergone revisions and strengthening.

FERC Order 890 amended the regulations and the pro forma open-access transmission tariff adopted in Order 888 and 889 to ensure that transmission services are provided on a basis that is just, reasonable and not unduly discriminatory or preferential. The final rule was designed to: (1) strengthen the pro forma open-access transmission tariff, or OATT to ensure that it achieves its original purpose of remedying undue discrimination; (2) provide greater specificity to reduce opportunities for undue discrimination and facilitate the Commission's enforcement; and (3) increase transparency in the rules applicable to planning and use of the transmission system.

On December 20, 2012 the FERC issued a final ruling approving revisions to NERC's "Bulk Electric System" definition. Key revisions to the approved definition removed language allowing for broad discretion across the reliability regions in North America and establish a "bright-line" threshold that includes all facilities operated at or above 100 kilovolts. The revised definition requires that more facilities be covered and be compliant with the NERC Transmission Planning Reliability Standards than under the previous definition. Future transmission planning assessments and studies must be expanded to adhere to this revised definition to comply with the NERC reliability standards.

On March 19, 2015 FERC approved Order 1000 that requires a transition in the way New England plans the transmission system. ISO-NE is currently working on the implementation of the Order 1000 process as it pertains to Eversource and all New England public utility transmission owners.

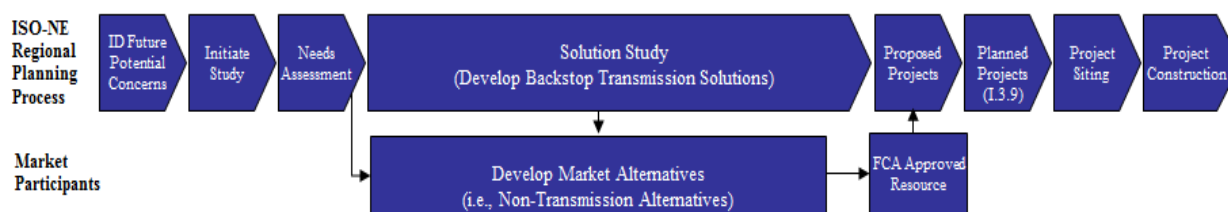
### 4.3 Transmission Planning Process

Within the ISO-NE regional planning process that strives for compliance with NERC and NPCC planning standards, ISO-NE performs reliability assessment studies of the New England transmission system. Individual sub-area studies (“Needs Assessments”) are performed to identify system needs over a ten-year horizon. When a system reliability problem is identified from a needs assessment, ISO-NE and the Transmission Owners (“TO”) develop one or more transmission system options (i.e., backstop transmission solutions) to resolve the transmission reliability needs and ensure that NERC and NPCC reliability standards are met.

The transmission system solution options are then further evaluated to determine their feasibility of construction, potential for environmental impacts, estimated costs, longevity, operational differences, etc. When analysis of the options is complete, the TOs recommend a proposed transmission project to ISO-NE and the PAC. In parallel, market participants can develop and propose market resource alternatives (“MRA”) to resolve the identified needs.

These transmission studies, and the transmission solutions, are documented in a Solution Study report, and in aggregate, provide a basis for updating ISO-NE’s Regional System Plan (“RSP”) as depicted in the sequence of the process below:

**Transmission Planning Process Figure 1**



Eversource performs routine inspections of its own transmission facilities to ensure the safe installation, operation, and maintenance of the transmission electric power systems including bulk power substations, overhead and underground transmission lines and or related equipment.

### 4.4 Connecticut’s Transmission System and Serving Load

Eversource plans, builds and operates transmission infrastructure with a goal of safely and reliably delivering power to its customers, under a wide variety of supply and demand conditions.

- Eversource is responsible to meet reliability standards mandated by the FERC and implemented by NERC and faces severe financial penalties of up to \$1 million per day for *each* non-compliance occurrence.
- Connecticut’s potential to develop large quantities of renewable and/or low carbon energy resources like wind and hydroelectric power is low, but wind and hydroelectric power have greater development prospects in northern New England and Canada.

## 4.5 Assessment of Transmission Needs in Connecticut's Sub-areas

Eversource divides its service territory into six areas as described below for the purpose of assessing the reliability of its transmission system. ISO-NE has identified reliability projects within those areas that are needed in Connecticut.

- The ISO-NE Southwest Connecticut Zone ("SWCT") area is the largest load area within Connecticut which comprises fifty-four towns, including all of United Illuminating's service territory, Wallingford Electric and some of the Connecticut Municipal Electric Energy Cooperative, Inc ("CMEEC") service territory. This area includes the towns essentially west of Interstate 91 and south of Interstate 84, and accounts for approximately half of the state's peak electric load demand. In July of 2014, the Southwest Connecticut 2022 Preferred Solution was presented to ISO-NE Planning Advisory Committee ("PAC"). Eversource received ISO-NE approval for the SWCT preferred Solution in April of 2015. There also is a reliability project proposed in the Norwalk Stamford subarea known as the Greenwich Substation and Line project to meet load serving needs. This project is currently under development.
- The Eastern Connecticut Area extends in a westerly direction for about twenty miles from the Rhode Island border and north from Long Island Sound to the Massachusetts border. The area is served by both Eversource and CMEEC. The Eastern Connecticut Needs Assessment was completed in 2013. Eversource is currently reviewing the Eastern Connecticut solutions to address the needs identified in Eastern Connecticut.
- The Greater Hartford/Central Connecticut ("GHCC") needs assessment was completed in February, 2014, and a needs report was published in April, 2014. The preferred solutions for the identified needs were presented to PAC in July, 2014. The preferred solution consists of transmission improvements in each of the four GHCC subareas, and include elements that will perform a "double duty" of both meeting local load-serving needs and addressing the remaining need for increased Western Connecticut import capability. Eversource received ISO-NE approval for the GHCC preferred Solution in April of 2015.
- The four GHCC subareas are:
  - The Manchester - Barbour Hill Area includes towns north and south of Manchester. These include Glastonbury to the south and the Massachusetts border towns of Enfield, Suffield, and Somers to the north.
  - The Middletown Area consists of a five- to ten-mile-wide band east and west of the Connecticut River from Hebron to Old Lyme. The westerly section consists of the area included in a triangle that runs from Middletown to Old Saybrook and back to the eastern part of Meriden.
  - The Greater Hartford Area includes the towns in the vicinity of the Capitol city and stretches north to the Massachusetts border, west to the Farmington River, and south to the Route 691 interchange with the Berlin Turnpike. It straddles the Connecticut River in the heart of central Connecticut.
  - The Northwestern Connecticut Area is the portion of the state bounded north and west by the Massachusetts and New York state borders, easterly toward Route 8 and southerly to the SWCT region.

A list of all transmission projects and their components is listed by transmission line and substation in tables 4-1 and 4.2, below. Transmission line reinforcements are identified by entries under the “from” and “to” station headings in Table 4.1. Station reinforcements are identified by single line entries under the “from” station heading in Table 4.2. The term “station” is interchangeable with substation or switching station. The tables include information on the project’s proposed in service date (“ISD”).

**Table 4-1: Eversource Proposed Transmission Line Projects in Connecticut**

<b>From Station</b>	<b>City or Town</b>	<b>To Station</b>	<b>City or Town</b>	<b>Voltage kV</b>	<b>ISD</b>	<b>Miles</b>	<b>Project Description</b>	<b>Status</b>
Wilton	Wilton	Norwalk	Norwalk	115	2017	1.5	(SWCT) – Rebuild Line section	Under Construction
Frost Bridge	Watertown	Campville	Harwinton	115	2017	10.4	(GHCC) – New Line	Under Construction
South Meadow	Hartford	Bloomfield	Bloomfield	115	2017	N/A	(GHCC) - Loop in and out of Rood Ave substation	Under Construction
Bloomfield Bloomfield Bloomfield	Bloomfield Bloomfield Bloomfield	South Meadow Rood Ave N.Bloomfield	Hartford Windsor Bloomfield	115	2017	N/A	(GHCC) - Line Separation	Under Construction
Bloomfield N.Bloomfield	Bloomfield Bloomfield	N.Bloomfield NW Hartford	Bloomfield Hartford	115	2017	N/A	(GHCC) - Line Separation	Under Construction
Branford Branford	Branford Branford	Branford RR North Haven	Branford North Haven	115	2017	N/A	(GHCC) - Line Separation	Under Construction
Middletown East Meriden	Middletown Meriden	Haddam Haddam	Haddam Haddam	115	2017	8.0	Double Circuit Line Structure Replacement	Under Construction
Wilton	Wilton	Ridgefield Jct.	Ridgefield	115	2017	5.1	(SWCT) – Reconductor Line Section	Planned
Peaceable	Redding	Ridgefield Jct.	Ridgefield	115	2017	0.04	(SWCT) – Reconductor Line Section	Planned
Southington Southington	Southington Southington	Todd Canal	Wolcott Southington	115 115	2017	N/A	(GHCC) - Replace Line reactors	Planned
South Meadow	Hartford	Bloomfield	Bloomfield	115	2017	N/A	Rebuild Line Section	Planned
Rocky River	New Milford	Bulls Bridge	New Milford	115	2017	6.6	Rebuild Line	Planned
Frost Bridge Thomaston	Watertown Thomaston	Campville Campville	Harwinton Harwinton	115 115	2018	N/A	(GHCC) - Line Separation	Under Construction
Towantic	Oxford	Bunker Hill	Waterbury	115	2018	6.0	Reconductor/Rebuild Line Section	Under Construction
Towantic	Oxford	Baldwin Tap	Waterbury	115	2018	3.0	Reconductor Line Section	Under Construction
Devon	Milford	Trumbull Jct.	Trumbull	115	2018	4.4	Reconductor Line Section	Under Construction
Devon	Milford	UI – Border	Trumbull	115	2018	4.5	Reconductor – Line Section	Under Construction
Towantic	Oxford	Oxford	Oxford	115	2018	1.2	Reconductor – Line Section	Under Construction
Cos Cob	Greenwich	Greenwich	Greenwich	115	2018	2.4	New Line	Planned
Cos Cob	Greenwich	Greenwich	Greenwich	115	2018	2.4	New Line	Planned
Newington	Newington	Newington Tap	Newington	115	2018	0.01	(GHCC) – Reconductor Line Section	Planned
Newington	Newington	SW Hartford	Hartford	115	2018	4.0	(GHCC) - New Line & Series Reactor	Planned
West Brookfield	Brookfield	West Brookfield Jct.	Brookfield	115	2018	1.4	(SWCT) – Reconductor Line Section	Planned
Plumtree	Bethel	Brookfield Jct.	Brookfield	115	2018	3.4	(SWCT) – New Line	Planned
South Meadow	Hartford	SW Hartford	Hartford	115	2018	N/A	(GHCC) - Install a series reactor	Planned

<b>From Station</b>	<b>City or Town</b>	<b>To Station</b>	<b>City or Town</b>	<b>Voltage kV</b>	<b>ISD</b>	<b>Miles</b>	<b>Project Description</b>	<b>Status</b>
Beacon Falls	Beacon Falls	Indian Well (UI) Devon	Derby Milford	115	2018	N/A	(SWCT) - Loop in and out of Pootatuck	Planned
Beseck Southington	Wallingford Southington	East Devon Mix Ave (UI) June St (UI)	Milford Hamden Woodbridge	115	2018	N/A	(SWCT) - Line Separation	Planned
Plumtree	Bethel	Stony Hill Bates Rock	Brookfield Southbury	115	2018	N/A	(SWCT) – Line Reconfiguration	Planned
Plumtree	Bethel	West Brookfield Shepaug	Brookfield Southbury	115	2018	N/A	(SWCT) – Line Reconfiguration	Planned

**Table 4-2: Eversource Proposed Substation Projects in Connecticut**

<b>Substation</b>	<b>City or Town</b>	<b>Voltage kV</b>	<b>ISD</b>	<b>Project Description</b>	<b>Status</b>
Haddam	Haddam	345/115	2017	(GHCC) – Add an autotransformer and Reconfiguration	Under Construction
Rood Ave	Windsor	115	2017	(GHCC) – Reconfigure substation	Under Construction
Branford	Branford	115	2017	(GHCC) – Add a series breaker and increase size of the 115 kV capacitor	Under Construction
Baldwin	Waterbury	115	2017	(SWCT) – Close circuit breaker	Under Construction
Plumtree	Bethel	115	2017	(SWCT) - Add a circuit breaker & and relocate a capacitor bank	Under Construction
Manchester	Manchester	115/23	2017	Replace transformer	Under Construction
Tracy	Putnam	115/23	2017	Add a distribution transformer and a circuit breaker	Under Construction
Berlin	Berlin	115	2017	(GHCC) – Reconfigure substation and add two breakers	Planned
Southington	Southington	115	2017	(GHCC) – Replace breaker with series reactor and add a new control house	Planned
Southington	Southington	345	2017	(GHCC) – Add a circuit breaker	Planned
Haddam Neck	Haddam	345	2017	(GHCC) – Upgrade terminal equipment	Planned
Green Hill	Madison	115	2017	(GHCC) – Reconfigure substation and install a capacitor bank	Planned
West Brookfield	Brookfield	115	2017	(SWCT) – Install two capacitor banks	Planned
Rocky River	New Milford	115	2017	(SWCT) – Reduce capacitor bank size	Planned
Campville	Harwinton	115	2018	(GHCC) – Add five circuit breakers	Under Construction
Westside	Middletown	115	2018	(GHCC) – Install a capacitor bank	Planned
Stony Hill	Brookfield	115	2018	(SWCT) – Add a Synchronous Condenser & relocate a capacitor bank	Planned
Southwest Hartford	Hartford	115	2018	(GHCC) – Upgrade terminal equipment	Planned
Newington	Newington	115	2018	(GHCC) – Reconfigure substation	Planned
Cos Cob	Greenwich	115	2018	Add a circuit breaker	Planned
Greenwich	Greenwich	115/13.2	2018	Add a new substation	Planned
Bloomfield	Bloomfield	115/23	2018	Replace transformer	Concept
Westside	Middletown	115/13.2	2018	Replace Transformer	Concept
Newington	Newington	115/23	2018	Replace Transformer	Concept
Scitico	Enfield	115/23	2019	Add a distribution transformer	Concept
North East Simsbury	Simsbury	115/23	2019	Add a distribution transformer	Concept
Franklin Drive	Torrington	115/13.2	2019	Replace both distribution transformer	Concept
Canton	Canton	115/23	2019	Replace distribution transformer	Concept
Newtown	Newtown	115/13.8	2020	Replace both distribution transformers	Concept
Mansfield	Mansfield	115/23	2020	Add a distribution transformer	Concept
Rood Ave	Windsor	115/23	2020	Add a distribution transformer	Concept
West Brookfield	Brookfield	115/13.8	2020	Add a distribution transformer	Concept



## **4.6 Incorporation of Renewables through Transmission, Including Future Outlook**

Northern Pass is Eversource's planned High Voltage Direct Current ("HVDC") transmission line from the Québec-New Hampshire border to Franklin, New Hampshire and an associated alternating current radial transmission line between Franklin and Deerfield, New Hampshire. Northern Pass will interconnect at the Québec-New Hampshire border with a planned HQ HVDC transmission line. On July 21, 2015, the U.S. Department of Energy ("DOE") issued the draft Environmental Impact Statement ("EIS") for Northern Pass representing a key milestone in the permitting process. The DOE completed the comment period on the draft EIS on April 4, 2016, and is expected to issue the final EIS in the second quarter of 2017. On August 18, 2015, Northern Pass Transmission Project ("NPT") announced the Forward NH Plan, including a commitment to allocate \$200 million over the first 20 years of operation to a fund supporting initiatives associated with economic development, tourism, community betterment, and clean energy innovation to benefit the state of New Hampshire.

On June 10, 2016, Northern Pass executed a settlement agreement with the New Hampshire Public Utility Commission ("NHPUC") Staff regarding its petition to operate as a public utility once the project is fully permitted. On October 14, 2016, in an important foundational order for the NPT, the NHPUC approved the settlement agreement and granted NPT public utility status, conditioned on project approval. Additionally, on June 28, 2016, as part of the Forward NH Plan, the Public Service Company of New Hampshire ("PSNH") filed a power purchase agreement ("PPA") with the NHPUC. The PPA, combined with the Forward NH Plan, is expected to deliver over \$1 billion of energy cost savings and other benefits over the contract term to New Hampshire customers. The Forward NH Plan and the PPA are both commitments that are contingent upon the Northern Pass transmission line going into commercial operation.

On July 19, 2016, ISO-NE approved the NPT Proposed Plan Application indicating that there would be no significant adverse impact on the regional grid.

The Northern Pass project is currently under review by the New Hampshire Site Evaluation Committee ("NH SEC") and the DOE. The NH SEC is expected to issue an order on NPT no later than September 2017, with DOE approval to follow shortly thereafter.