

March 1, 2019

Ms. Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: CL&P dba Eversource Energy Forecast of Loads & Resources for the Period 2019-2028

Dear Ms. Bachman:

The Connecticut Light and Power Company dba Eversource Energy (the "Company") submits herewith 15 copies of the Company's 2019 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



2019 Forecast of Loads and Resources

for the Period 2019-2028

March 1, 2019

List of Acronyms

“ACEEE”	American Council for an Energy Efficiency Economy
“C&LM”	Conservation and Load Management
“CAGR”	Compound Annual Growth Rate
“CEAB”	Connecticut Energy Advisory Board
“CSC”	Connecticut Siting Council
“CMEEC”	Connecticut Municipal Electric Energy Cooperative, Inc.
“DEEP”	Department of Energy and Environmental Protection
“DOE”	Department of Energy
“EE”	Energy Efficiency
“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
“HQ”	Hydro Québec
“HVDC”	High Voltage Direct Current
“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
“KW-Month”	Kilowatt month
“LREC”	Low Emission Renewable Energy Credits
“MW”	Megawatt or 1,000,000 Watts
“NERC”	North American Electric Reliability Corporation
“NHPUC”	New Hampshire Public Utility Commission
“NH SEC”	New Hampshire Site Evaluation Committee
“NNE”	Northern New England

List of Acronyms, Continued

“NPCC”	Northeast Power Coordinating Council
“NPT”	Northern Pass Transmission Project
“NTA”	Non-Transmission Alternative
“PA 11-80”	Public Act 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection
“PAC”	Planning Advisory Committee
“PV”	Photovoltaic
“PURA”	Public Utilities Regulatory Authority
“RFP”	Request for Proposal
“RGGI”	Regional Greenhouse Gas Initiative
“ROFR”	Right of First Refusal
“RSP”	ISO-NE’s Regional System Plan
“SENE”	Southeast New England
“SWCT”	ISO-NE Southwest Connecticut Zone
“TO”	Transmission Owner
“ZREC”	Zero Emission Renewable Energy Credit

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Chapter 1: INTRODUCTION

1.1 Overview of Eversource's 2019 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 2019 FLR includes the following information¹:

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 0.7% per year, but peak demand is expected to increase by a weather-normalized CAGR of 0.5% per year over the 10-year forecast period from 2019 through 2028.

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 Integrated Resource ("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 the Department of Energy and Environmental Protection ("DEEP") to create an IRP by January 1, 2012 and biennially thereafter, in consultation with Connecticut Energy Advisory Board ("CEAB")² and the Electric Distribution Companies ("EDCs").

On March 17, 2015, DEEP issued its 2014 IRP for Connecticut presenting a comprehensive plan for improving Connecticut's electric energy future. DEEP is currently developing its latest IRP and has yet to issue a draft for comment.

¹ 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.

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

ISO-NE Wholesale Electric Markets

Section 2.2 of this report discusses the results of the most recent Forward Capacity Auction (“FCA”) in the ISO-NE wholesale electricity market.

Energy Efficiency Programs

For many years, Eversource has been developing and implementing nationally recognized Energy Efficiency (“EE”) 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 (“FCM”).

On October 31, 2017, the state of Connecticut passed a budget for biennium ending June 30, 2019. This budget swept approximately \$117 million from the energy efficiency fund and an additional \$20 million from the RGGI over the next two fiscal years into the state’s General Fund. However, for Eversource, this negative impact will largely be offset by an incremental energy efficiency bid pursuant to Docket No. 17-01-11, PURA Review of Public Act 15-107(B) Small-Scale Energy Resource Agreements. 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.
- Eversource Transmission Line Department is continuing to improve the reliability of the transmission system. Inspections have found degradation of many overhead wood transmission structures. Replacing these structures over the next several years resolves multiple structural/hardware issues and supports safe and reliable operation.

Chapter 2: FORECAST OF LOADS AND RESOURCES

Chapter Highlights

- Electric energy usage is expected to decrease by 0.7% per year over the 10-year forecast period; however, peak demand is expected to increase by 0.5% 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 the Fall/Winter of 2018, and are based on Eversource's total franchise area. The base case or 50/50³ 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, projected reductions resulting from solar installations and expected additions due to electric vehicles.

The Reference Plan *Peak Demand* Forecast is also based on an econometric model, adjusted for energy efficiency, solar and expected large customer additions.

The Reference Plan Forecast is used for Eversource's financial planning and distribution system planning, but is not used for transmission system 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 0.7% for Eversource from 2018- 2028. Without the Company's energy efficiency programs, solar installations or electric vehicles, the forecasted energy growth rate is projected to be a *decrease* in the weather-normalized CAGR of 0.4%.

The weather-normalized CAGR for summer peak demand in the Reference Plan *Peak Demand* Forecast is forecasted to increase by 0.5% over the ten-year forecast period. Similarly, if Eversource's Energy Efficiency and solar installations, along with our large customer additions were excluded, the increase in the CAGR for forecasted peak demand would be 0.6%.

³ 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%.

Table 2-1 provides historic output and summer peaks, actual and normalized for weather, for the 2014-2018 period, and forecast output and peaks for the 2019-2028 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 84° F and is based on the average peak day temperatures from 2009-2018. 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 point of time chosen is generally insignificant, unless the forecast drivers are at a turning point. Outlined below are six 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 2018. 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 ("PV") - 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.
- Energy Efficiency – This forecast includes explicit reductions to electrical energy output and peak demand due company sponsored energy efficiency based on the most recent 3-year plan.
- 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 most of the charging will be done off-peak.
- Large Customers – The peak demand forecast includes explicit adjustments for large customer additions with expected demands greater than 0.25 MW's.
- Weather - The Reference Plan Peak Demand Forecast assumes normal weather based on a ten-year average (2009 - 2018). The historical peak day 24- hour mean temperatures range from 79° 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 2017, 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 2028 summer peak forecast reflecting average peak-producing weather is 5,270 MWs.

However, either extremely mild or extremely hot weather could result in a range of potential peak loads from 4,879 MWs to 5,710 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 2019 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)
<u>HISTORY</u>											
2014	23041		4772		0.551						
2015	23047	0.0%	4850	1.6%	0.543						
2016	22460	-2.5%	4948	2.0%	0.517						
2017	21686	-3.4%	4721	-4.6%	0.524						
2018	22236	2.5%	5045	6.8%	0.503						
Compound Rates of Growth (2014-2018)											
		-0.9%		1.4%							
<u>HISTORY NORMALIZED FOR WEATHER</u>											
2014	22992		5002		0.525						
2015	22811	-0.8%	5034	0.6%	0.517						
2016	22242	-2.5%	4953	-1.6%	0.511						
2017	21755	-2.2%	5098	2.9%	0.487						
2018	21657	-0.4%	4989	-2.1%	0.496						
Compound Rates of Growth (2014-2018)											
		-1.5%		-0.1%							
<u>FORECAST</u>											
2019	21600	-0.3%	5064	1.5%	0.487	5481	9.9%	0.450	4694	-5.9%	0.525
2020	21472	-0.6%	5051	-0.3%	0.484	5471	-0.2%	0.447	4679	-0.3%	0.522
2021	21231	-1.1%	5079	0.6%	0.477	5502	0.6%	0.441	4705	0.6%	0.515
2022	21051	-0.9%	5127	0.9%	0.469	5553	0.9%	0.433	4751	1.0%	0.506
2023	20901	-0.7%	5155	0.5%	0.463	5583	0.5%	0.427	4776	0.5%	0.500
2024	20805	-0.5%	5175	0.4%	0.458	5605	0.4%	0.423	4793	0.4%	0.494
2025	20579	-1.1%	5200	0.5%	0.452	5633	0.5%	0.417	4816	0.5%	0.488
2026	20444	-0.7%	5221	0.4%	0.447	5657	0.4%	0.413	4835	0.4%	0.483
2027	20330	-0.6%	5242	0.4%	0.443	5679	0.4%	0.409	4853	0.4%	0.478
2028	20288	-0.2%	5270	0.5%	0.438	5710	0.5%	0.404	4879	0.5%	0.473
Compound Rates of Growth (2018-2028)											
		-0.9%		0.4%			1.2%			-0.3%	
Normalized Compound Rates of Growth (2018-2028)											
		-0.7%		0.5%			1.4%			-0.2%	

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 (84° 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 2017 peak day (79° mean daily temperature).

2.1.3 ISO-NE Demand Forecasts

The CSC's [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 peak demand forecasts include explicit reductions for the Company's EE programs, solar resources and explicit large customer additions, while the ISO-NE demand forecasts do not include these adjustments; instead, ISO-NE considers EE 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 EE programs, solar and large customer additions 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)							
Year	Unadjusted Output	Solar	Company Energy Efficiency	Large Customer Additions	Electric Vehicles	Adjusted Output	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2018						21,657	
FORECAST							
2019	21,641	(24)	(17)	-	5	21,600	-0.3%
2020	21,618	(90)	(57)	-	20	21,472	-0.6%
2021	21,457	(133)	(92)	-	41	21,231	-1.1%
2022	21,305	(133)	(121)	-	63	21,051	-0.9%
2023	21,190	(140)	(149)	-	84	20,901	-0.7%
2024	21,134	(155)	(174)	-	106	20,805	-0.5%
2025	20,942	(170)	(193)	-	130	20,579	-1.1%
2026	20,833	(185)	(204)	-	155	20,444	-0.7%
2027	20,738	(200)	(208)	-	184	20,330	-0.6%
2028	20,711	(215)	(208)	-	215	20,288	-0.2%
Normalized Compound Rates of Growth (2018-2028)							
						-0.4%	-0.7%
50/50 Reference Plan (MW)							
Year	Unadjusted Peak	Solar	Company Energy Efficiency	Large Customer Additions		Adjusted Peak	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2018						4,989	
FORECAST							
2019	5,095	(29)	(22)	19	-	5,064	1.5%
2020	5,094	(41)	(30)	28	-	5,051	-0.3%
2021	5,124	(47)	(35)	37	-	5,079	0.6%
2022	5,163	(47)	(35)	46	-	5,127	0.9%
2023	5,189	(48)	(35)	49	-	5,155	0.5%
2024	5,210	(50)	(35)	49	-	5,175	0.4%
2025	5,238	(52)	(35)	49	-	5,200	0.5%
2026	5,261	(54)	(35)	49	-	5,221	0.4%
2027	5,283	(56)	(35)	49	-	5,242	0.4%
2028	5,313	(57)	(35)	49	-	5,270	0.5%
Normalized Compound Rates of Growth (2018-2028)							
						0.6%	0.5%
Extreme Hot Weather Scenario (MW)							
Year	Unadjusted Peak	Solar	Company Energy Efficiency	Large Customer Additions		Adjusted Peak	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2018						4,989	
FORECAST							
2019	5,513	(29)	(22)	19	-	5,481	9.9%
2020	5,514	(41)	(30)	28	-	5,471	-0.2%
2021	5,547	(47)	(35)	37	-	5,502	0.6%
2022	5,588	(47)	(35)	46	-	5,553	0.9%
2023	5,616	(48)	(35)	49	-	5,583	0.5%
2024	5,640	(50)	(35)	49	-	5,605	0.4%
2025	5,670	(52)	(35)	49	-	5,633	0.5%
2026	5,696	(54)	(35)	49	-	5,657	0.4%
2027	5,721	(56)	(35)	49	-	5,679	0.4%
2028	5,753	(57)	(35)	49	-	5,710	0.5%
Normalized Compound Rates of Growth (2018-2028)							
						1.4%	1.4%

2.2 ISO-NE Wholesale Electric Markets

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

The thirteenth FCA took place on Monday, February 4, 2019. Virtually all the information about FCA 13 has been taken from the ISO-NE press release, which can be found at the following location:

https://www.iso-ne.com/static-assets/documents/2019/02/20190206_pr_fca13_initial_results.pdf

Holyoke, MA—February 6, 2019—New England’s annual capacity auction for power system resources concluded Monday with sufficient resources to meet peak demand in 2022-2023, and preliminary results indicate the clearing price was the lowest in six years. The auction is run by ISO New England Inc. to procure the resources that will be needed to meet consumer demand for electricity in three years.

The auction was the first run under the Competitive Auctions with Sponsored Policy Resources (CASPR) rules, which include a secondary substitution auction where resources interested in retiring can trade their capacity supply obligation to new state-sponsored resources that didn’t clear in the primary auction.

The 13th Forward Capacity Market (FCM) primary auction (FCA #13) closed at a preliminary clearing price of \$3.80 per kilowatt-month (kW-month) across New England, compared to \$4.63/kW-month in last year’s auction. The substitution auction closed with Vineyard Wind, an offshore wind project in development off the coast of Massachusetts, assuming an obligation of 54 megawatts from an existing resource that will retire in 2022-2023.

Resources totaling 43,641 megawatts (MW), including 34,925 MW of existing capacity and 238 new resources totaling 8,716 MW, qualified to participate in the FCM, while the regional capacity target for 2022-2023 is 33,750 MW.

The primary auction concluded with commitments from 34,839 MW to be available in 2022-2023, with 1,089 MW of surplus supply over the capacity requirement. 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.

More than 2,600 MW of new resources secured obligations during the primary and substitution auctions, including the Killingly Energy Center, a 650 MW natural gas plant under development in Connecticut, new energy efficiency and demand response resources, and imports.

Approximately 145 MW of resources received obligations under the renewable technology resource (RTR) designation. The RTR designation allows a limited amount of renewable resources to participate in the auction without being subject to the minimum offer-price rule. Resources receiving an obligation under the exemption included solar photovoltaic (PV) systems and solar PV systems paired with batteries.

Under the rules of ISO New England’s tariff, only renewable resources built within New England were eligible for the RTR exemption in FCA #13. Offshore wind projects proposed for federal waters will be eligible for the exemption in FCA #14, scheduled for February 2020. More than 300 MW remain in the RTR exemption cap and will be carried over to next year’s auction.

Following procedures approved by the Federal Energy Regulatory Commission (FERC), ISO New England retained two units, Mystic 8 and 9, needed for fuel security in the 2022-2023 capacity year.

“This year’s auctions procured the resources needed for a reliable power system at a competitive price, while implementing new procedures to accommodate state-sponsored renewable resources,” said Robert Ethier, vice president of market operations at ISO New England. “It’s our responsibility to run these auctions and our wholesale markets under the rules approved by FERC, and we fulfilled that responsibility again this year.”

Preliminary results of FCA #13:

- The primary auction closed for most resources at \$3.80/kW-month after four rounds of competitive bidding. Resources within New England’s three capacity zones, as well as imports over three of the external ties closed at that price. Imports over one other interconnection from New Brunswick continued into a fifth round, which closed at \$2.68/kW-month.
- Previous clearing prices (all per kilowatt-month): FCA #7 (2013), \$3.15 floor price, except \$14.99 for new resources in the former Northeast Massachusetts/Boston zone; FCA #8 (2014), \$15 for new and \$7.025 for existing resources; FCA #9 (2015), \$9.55 system-wide except SEMA/RI: \$17.73 new and \$11.08 existing; FCA #10 (2016), \$7.03; FCA #11 (2017), \$5.30; FCA #12 (2018), \$4.63.
- In all, 54 MW of demand bids and supply offers cleared in the substitution auction.
- At the primary auction clearing price of \$3.80/kW-month, the total value of the capacity market in 2022-2023 will be approximately \$1.6 billion (preliminary estimate).
- Capacity clearing the auction totaled 34,839 MW to meet the 33,750 MW net installed capacity target for 2022-2023
 - 29,611 MW of generation, including 783 MW of new in the primary auction and 54 MW of new in the substitution auction
 - 4,040 MW of energy-efficiency and demand-reduction measures, including 654 MW of new – the equivalent of a large power plant – in the primary auction
 - 1,188 MW of total imports in the primary auction from New York, Québec, Canada and New Brunswick, Canada
- In all, 2,009 MW of resources submitted retirement bids, while an additional 40 MW of resources submitted permanent de-list bids to leave the capacity market. Aside from the Mystic units retained for fuel security reasons, all of these bids were accepted before FCA #13.

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.
- On October 31, 2017, the state of Connecticut passed a budget for biennium ending June 30, 2019. This budget swept approximately \$117 million from the energy efficiency fund and an additional \$20 million from the Regional Green House Gas Initiative over the next two fiscal years into the state's General Fund.
- The energy efficiency forecast includes a portion of 34 MW of energy savings from Incremental Energy Efficiency pursuant to CT Public Act 15-107 Section 1(b) that initiated in 2017. *An Act Concerning Affordable and reliable Energy.*

CL&P 2019 - 2021 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.

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 *2018 State Energy Efficiency Scorecard*, Connecticut ranked fifth in the nation. This ranking reflects the success of Connecticut’s energy efficiency programs.

Eversource with guidance from the Energy Efficiency Board, 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.

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 efficiency. 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, 2015.⁴ 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.

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.⁵ 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 Forward Capacity Market and from the RGGI.

On October 31, 2017, the state of Connecticut passed a budget for biennium ending June 30, 2019. This budget swept approximately \$117 million from the energy efficiency fund and \$20 million from the RGGI over the next two fiscal years into the state’s General Fund. For Eversource, the reduced energy efficiency budgets will result in approximately a 17 percent reduction in funding for energy efficiency electric programs in 2017, a 33 percent reduction in 2018, and a 17 percent reduction in 2019, and commensurate reductions in savings during this timeframe.

On September 7, 2017 the Public Utilities Regulatory Authority (“PURA”) approved Eversource’s incremental energy efficiency bid pursuant to Docket No. 17-01-11, PURA Review of Public Act 15-107(B) Small- Scale Energy Resource Agreements (the “Decision”). This Decision authorized the procurement of 34 MW passive demand resources by incrementally scaling up participation in a subset of existing energy efficiency programs over a period of four years beginning on October 1, 2017. The net effect of this of incremental energy efficiency bid will largely mitigate the impact of the State of Connecticut energy efficiency budget sweep.

The annual energy savings forecast in Table 3-1 is based on a reduced C&LM funding commensurate with the Connecticut energy efficiency budget sweep and the additional energy efficiency due to Incremental Energy Efficiency bid pursuant to CT Public Act 15-107 1(b) as described above.

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 2019 Update to the 2019-2021 C&LM Plan. Forecasted savings beyond 2021 assumes similar programs, and savings as anticipated in 2021. However, savings in years 2021 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.

⁴ 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.

⁵ Conn. Gen. Stat. § 16-245m

Table 3-1										
CL&P C&LM Programs Annual Energy Savings										
and										
Peak Load Reduction by Customer Class										
Connecticut Light and Power										
2019-2028										
GWh Sales Saved										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential	107	177	228	271	310	344	366	387	401	415
Commercial	180	307	428	529	620	702	776	842	902	955
Industrial	54	92	128	159	186	210	232	252	270	286
Total	341	576	784	959	1,115	1,256	1,375	1,481	1,573	1,656
MW Reductions (Passive Resource Summer Impacts)										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential	15	25	34	41	47	53	57	61	64	66
Commercial (non-Load Response)	23	41	59	73	86	97	108	117	126	133
Industrial (non-Load Response)	7	12	18	22	26	29	32	35	38	40
Total	45	79	110	136	159	179	197	213	227	240
MW Reductions (Passive Resource Winter Impacts)										
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Residential	23	40	54	66	77	87	94	101	107	112
Commercial (non-Load Response)	28	48	68	84	99	112	124	135	145	154
Industrial (non-Load Response)	8	14	20	25	30	34	37	40	43	46
Total	59	103	142	176	206	233	256	277	295	311

Notes:

- 1) This table includes only passive resources. It does not include 32.6 MW of Active Demand Response that is planned during this period.
- 2) Total savings assumes that all measures will continue to provide savings for their measure lives throughout the forecast period.
- 3) The forecast includes 34MW of Summer Peak Savings from Incremental Energy Efficiency bid installed between 2017 and 2021.

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 the Northeast Power Coordinating Council ("NPCC") and ISO-NE reliability standards and criteria.

On December 20, 2012, the Federal Energy Regulatory Commission ("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. Periodic transmission planning assessments and studies have been expanded to adhere to this revised definition to comply with the NERC reliability standards.

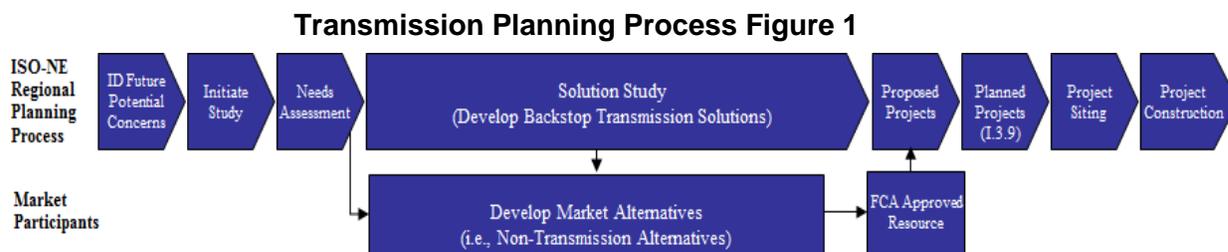
On March 19, 2015 FERC approved Order 1000 that requires a transition in the way New England plans the transmission system. In May 2015, ISO New England implemented changes to the regional and interregional transmission planning process to comply with the directives in FERC Order No. 1000 which establishes new electric transmission planning and cost allocation requirements for public utility transmission providers. This will introduce competition into the development of regulated transmission solutions. It removes arrangements that protect the right of first refusal ("ROFR") for incumbent transmission providers.

4.3 Transmission Planning Process

Within the ISO-NE regional planning process established 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 Planning Advisory Committee ("PAC"). In parallel, market participants can develop and propose Non-Transmission Alternatives ("NTA") 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:



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. Penalties for non-compliance can be up to \$1.2 million per event per day, based on the severity of the violation.

4.5 Assessment of Transmission Needs in Connecticut’s Sub-areas

Eversource divides its service territory into several 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 Avangrid’s service territory, Wallingford Electric and some of the Connecticut Municipal Electric Energy Cooperative (“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 PAC. Eversource received ISO-NE approval for the SWCT preferred Solution in April of 2015 and is currently under construction and is scheduled to be completed by the end of 2019. In July 2018, ISO-NE completed a 2027 Needs Assessment. No Solution Study is required because the reliability criteria violations will be solved through an assessment condition replacement project.
- There also is a local reliability project proposed in the Norwalk Stamford subarea known as the Greenwich Substation and Line project to meet load serving needs. This project was approved by ISO-NE and has started construction. The project is scheduled for completion in 2020.
- 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. Eversource is currently reviewing the Eastern Connecticut solutions to address the needs identified in Eastern Connecticut. In May of 2018, ISO-NE completed a 2027 Needs Assessment that analyzed the performance of the sub- area. Eversource is currently finalizing the solution study with ISO-NE and CMEEC to address the criteria violations identified in the 2027 Needs Assessment.
- 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 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 and the project is currently under construction and is scheduled to be completed by the end of 2019.

- 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.
- Eversource Transmission Line Department is continuing to improve the reliability of the transmission system. Inspections have found indicated degradation of many overhead wood transmission structures. Replacing these structures over the next several years resolves multiple structural/hardware issues and supports a safe and reliable operation.

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 and asset condition projects 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

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	Status
Newington	Newington	Newington Tap	Newington	115	2019	0.01	(GHCC) – Reconductor Line Section	Under Construction
Newington	Newington	SW Hartford	Hartford	115	2019	4.0	(GHCC)- New Line & Series Reactor	Under Construction
West Brookfield	Brookfield	West Brookfield Jct.	Brookfield	115	2019	1.4	(SWCT) – Reconductor Line Section	Planned
South Meadow	Hartford	SW Hartford	Hartford	115	2019	N/A	(GHCC) - Install a series reactor	Under Construction
Rocky River	New Milford	Bulls Bridge	New Milford	115	2019	6.6	Rebuild Line	Under Construction
Wilton	Wilton	Ridgefield Jct.	Ridgefield	115	2019	5.1	(SWCT) – Reconductor Line Section	Planned
Peaceable	Redding	Ridgefield Jct.	Ridgefield	115	2019	0.04	(SWCT) – Reconductor Line Section	Planned
Barbour Hill	South Windsor	Enfield	Enfield	115	2019	N/A	Line Structure Replacements	Under Construction
Barbour Hill	South Windsor	Windsor Locks	Windsor Locks	115	2019	N/A	Line Structure Replacements	Under Construction
Windsor Locks	Windsor Locks	Enfield	Enfield	115	2019	N/A	Line Structure Replacements	Under Construction
Bean Hill (CMEEC)	Norwich	Tunnel	Preston	115	2019	N/A	Line Structure Replacements	Proposed
Bokum	Old Saybrook	Green Hill	Madison	115	2019	N/A	Line Structure Replacements	Under Construction
Card	Lebanon	Tunnel Montville	Preston Montville	115	2019	N/A	Line Structure Replacements	Under Construction
Card	Lebanon	Stockhouse (CMEEC)	Bozrah	115	2019	N/A	Line Structure Replacement	Under Construction
Fort Hill Farms (CMEEC)	Montville	Stockhouse (CMEEC)	Bozrah	115	2019	N/A	Line Structure Replacements	Under Construction
Montville	Montville	Bean Hill (CMEEC)	Norwich	115	2019	N/A	Line Structure Replacements	Under Construction
Dooley	Middletown	Middletown	Middletown	115	2019	N/A	Line Structure Replacements	Proposed
Campville	Harwinton	Frost Bridge	Watertown	115	2019	N/A	Line Structure Replacements	Proposed
Northeast Simsbury	Simsbury	Canton	Canton	115	2019	N/A	Line Structure Replacements	Proposed
Haddam	Haddam	Bokum	Old Saybrook	115	2019	N/A	Line Structure Replacements	Proposed
Montville	Montville	Mystic Buddington (CMEEC)	Stonington Groton	115	2019	N/A	Line Structure Replacements	Proposed
Manchester	Manchester	South Windsor	South Windsor	115	2019	N/A	Line Structure Replacements	Proposed
Montville	Montville	Buddington (CMEEC)	Groton	115	2019	N/A	Line Structure Replacements	Proposed
Manchester	Manchester	Rood Ave	Windsor	115	2019	N/A	Line Structure Replacements	Proposed
Plumtree	Bethel	Peaceable Ridgefield	Ridgefield	115	2019	N/A	Line Structure Replacements	Proposed
Haddam	Haddam	Middletown	Middletown	115	2019	N/A	Line Structure Replacements	Proposed
South Windsor	South Windsor	Barbour Hill	South Windsor	115	2019	N/A	Line Structure Replacements	Proposed
Tunnel	Preston	Bean Hill (CMEEC)	Norwich	115	2019	N/A	Line Structure Replacements	Proposed

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	Status
North Bloomfield	Bloomfield	Farmington	Farmington	115	2019	N/A	Line Structure Replacements	Proposed
Mystic	Stonington	Shunock	North Stonington	115	2019	N/A	Line Structure Replacements	Proposed
North Bloomfield	Bloomfield	NW Hartford Rood Ave	Hartford Windsor	115	2019	N/A	Line Structure Replacements	Proposed
Bloomfield	Bloomfield	NW Hartford	Hartford	115	2019	N/A	Line Structure Replacements	Proposed
Portland	Portland	Hopewell	Glastonbury	115	2019	N/A	Line Structure Replacements	Proposed
Berlin	Berlin	Westside	Middletown	115	2019	N/A	Line Structure Replacements	Proposed
Westside	Middletown	Dooley	Middletown	115	2019	N/A	Line Structure Replacements	Proposed
Manchester	Manchester	Hopewell	Glastonbury	115	2019	N/A	Line Structure Replacements	Proposed
Plumtree	Bethel	Stony Hill	Brookfield	115	2019	N/A	Line Structure Replacements	Proposed
Stony Hill	Brookfield	Bates Rock	Southbury	115	2019	N/A	Line Structure Replacements	Proposed
East New Britain	New Britain	Berlin	Berlin	115	2019	N/A	Line Structure Replacements	Proposed
Haddam	Haddam	Pratt & Whitney	Middletown	115	2019	N/A	Line Structure Replacements	Proposed
Farmington	Farmington	Newington East New Britain	Newington New Britain	115	2019	N/A	Line Structure Replacements	Proposed
Newington	Newington	Berlin	Berlin	115	2019	N/A	Line Structure Replacements	Proposed
North Bloomfield	Bloomfield	Southwick (MA)	Southwick (MA)	115	2019	N/A	Line Structure Replacements	Proposed
Southington	Southington	Todd	Wolcott	115	2019	N/A	Line Structure Replacements	Proposed
Rowayton Jct.	Norwalk	Norwalk Harbor	Norwalk	115	2019	N/A	Line Cable Replacement	Proposed
Rowayton Jct.	Norwalk	Norwalk Harbor	Norwalk	115	2019	N/A	Line Cable Replacement	Proposed
Lake Road	Killingly	Card	Lebanon	345	2019	N/A	Line Structure Replacements	Under Construction
Long Mountain	New Milford	Eversource Border (CT/NY)	Kent	345	2019	N/A	Upgrade Line	Planned
Branford	Branford	North Haven (Avangrid)	North Haven	115	2020	N/A	Line Structure Replacements	Under Construction
Killingly	Killingly	Brooklyn Fry Brook Tunnel	Danielson Plainfield Preston	115	2020	N/A	Laminated Structure Replacements	Proposed
Killingly	Killingly	Exeter Fry Brook Tunnel	Plainfield Plainfield Preston	115	2020	N/A	Laminated Structure Replacements	Proposed
Bean Hill (CMEEC)	Norwich	Tunnel	Preston	115	2020	N/A	Laminated Structure Replacements	Proposed
Card	Lebanon	Tunnel Montville	Preston Montville	115	2020	N/A	Laminated Structure Replacements	Proposed
Campville	Harwinton	Thomaston	Thomaston	115	2020	N/A	Laminated Structure Replacements	Proposed
Cos Cob	Greenwich	Greenwich	Greenwich	115	2020	2.4	New Line	Planned
Cos Cob	Greenwich	Greenwich	Greenwich	115	2020	2.4	New Line	Planned
Montville	Montville	Bean Hill (Norwich)	Norwich	115	2020	N/A	Line Separation	Proposed

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	Status
Darien	Darien	Fitch St. (CMEEC)	Norwalk	115	2020	N/A	Line Relocation	Proposed
Sherwood	Westport	South Norwalk (CMEEC)	Norwalk	115	2020	N/A	Line Relocation	Proposed
Long Mountain	New Milford	Eversource Border (CT/NY)	Kent	345	2020	N/A	Line Structure Replacements	Under Construction

Table 4-2: Eversource Proposed Substation Projects in Connecticut

Substation	City or Town	Voltage kV	ISD	Project Description	Status
Southwest Hartford	Hartford	115	2019	(GHCC) – Upgrade terminal equipment	Under Construction
Newington	Newington	115	2019	(GHCC) – Reconfigure substation	Under Construction
Card	Lebanon	345/115	2019	Replace Autotransformer	Planned
Cos Cob	Greenwich	115	2019	Add two circuit breakers	Under Construction
Scitico	Enfield	115/23	2019	Add a distribution transformer and a circuit breaker	Proposed
Stepstone	Guilford	115/23	2019	Add a distribution transformer	Proposed
North East Simsbury	Simsbury	115/23	2019	Add a distribution transformer	Proposed
Southington	Southington	115	2019	Add a circuit breaker	Planned
Scitico	Enfield	115	2020	Add two circuit breakers for generator	Under Construction
Greenwich	Greenwich	115/13.2	2020	Add a new substation	Planned
Newington	Newington	115/23	2020	Replace Transformer	Concept
Rood Ave	Windsor	115/23	2020	Add a distribution transformer	Concept
Plumtree	Bethel	115	2020	Oil Circuit Breaker Replacement Project	Proposed
Franklin Drive	Torrington	115/13.2	2020	Replace both distribution transformer	Concept
Manchester	Manchester	115	2021	Manchester Control House Expansion	Proposed
Mansfield	Mansfield	115/23	2021	Add a distribution transformer	Concept
West Brookfield	Brookfield	115/13.8	2021	Replace a distribution transformer	Concept
Carmel Hill	Woodbury	115/23	2021	Add a distribution transformer	Concept
Sandy Hook	Newtown	115/23	2021	Add a distribution transformer	Concept
Beacon Falls	Beacon Falls	115	2022	Reconfigure substation to a ring bus	Planned
Glenbrook	Stamford	115/13.2	2022	Replace transformer	Concept
Ridgefield	Ridgefield	115/13.8	2022	Add a distribution transformer	Concept
Falls Village	Canaan	69/13.2	2022	Replace transformer	Concept
Westside	Middletown	115/13.2	2023	Replace both distribution transformers	Concept
Millstone	Waterford	345	2023	Insulator Replacement	Proposed

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 Hydro Québec ("HQ") HVDC transmission line that will deliver 1090MW into the New England electrical system.

As of the first quarter of 2018, Northern Pass had secured nearly all of its state, federal and Canadian, including (1) the New Hampshire Public Utilities Commission ("NHPUC") approval of a lease between Northern Pass Transmission LLC ("NPT") and Eversource for the use of certain Eversource transmission rights-of way; (2) the U.S. Forest Service Record of Decision authorizing the issuance of a Special Use Permit and allowing Northern Pass to bury approximately 11 miles of transmission lines in areas along existing roads through the White Mountain National Forest, (3) the Province of Québec permit granted to HQ on December 21, 2017 to construct the hydroelectric transmission line that will connect at the border in Pittsburg, New Hampshire, (4) the Department of Energy ("DOE") Record of Decision and Presidential Permit authorizing construction of transmission facilities at the Québec- New Hampshire border, and (5) the DOE final Environmental Impact Statement ("EIS"), which concluded that the proposed Northern Pass route is the preferred alternative, providing substantial benefits with only minimal impacts.⁶

Following an extensive siting process, the New Hampshire Site Evaluation Committee ("NHSEC") cut short its deliberations and denied the Northern Pass siting application on February 1, 2018. After consideration of two motions for rehearing the NHSEC confirmed its denial by final written order dated July 12, 2018. On August 10, 2018, NPT filed a Notice of Appeal with the New Hampshire Supreme Court, based on the NHSEC's failure to follow applicable law in its review of the project. On October 12, 2018, the New Hampshire Supreme Court accepted the appeal. The briefing period began with the filing of Northern Pass' opening brief on February 4, 2019. In its Brief, Northern Pass argues that the NHSEC's action constitutes impermissible arbitrary administrative decision in violation of applicable law and the Applicants' due process rights. Northern Pass has asked the NH Supreme Court to vacate the SEC's decision and remand the matter back to the NHSEC with instructions to consider all relevant evidence, benefits and impacts, mitigating measures and potential conditions, apply clear standards and to make all findings required by law. The briefing period will be followed by oral arguments before the full Court sometime during the 2nd quarter of 2019 with a decision expected in the fall timeframe.

Eversource intends to review all options for moving this critical clean energy project forward.

⁶ In late January 2018, Northern Pass was named the winner of the Massachusetts Clean Energy Request for Proposals which would have positioned Northern Pass to provide a firm delivery of hydropower to Massachusetts. This award was revoked because of the decision of the NHSEC.