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March 1, 2021

Ms. Melanie Bachman
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 2021-2030

Dear Ms. Bachman:

The Connecticut Light and Power Company dba Eversource Energy (the "Company") submits herewith 15 copies of the Company's 2021 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

2021 Forecast of Loads and Resources

for the Period 2021-2030

March 1, 2021

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
"EE"	Energy Efficiency
"EEB"	Energy Efficiency Board
"EDC"	Electric Distribution Company
"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
"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
"NPCC"	Northeast Power Coordinating Council
"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

List of Acronyms, Continued

“ROFR”	Right of First Refusal
“RSP”	ISO-NE’s Regional System Plan
“TO”	Transmission Owner
“ZREC”	Zero Emission Renewable Energy Credit

Contents

Chapter 1: INTRODUCTION

1.1 Overview of Eversource's 2020 Forecast of Loads and Resources 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 CSC for over forty years. This 2020 FLR includes the following information[1]:

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 remain flat with a weather-normalized CAGR of 0.0% per year, but peak demand is expected to increase by a weather-normalized CAGR of 0.3% per year over the 10- year forecast period from 2021 through 2030.

While Eversource is providing this forecast, which was developed for financial forecasting purposes, Eversource uses ISO-NE's 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, in consultation with the CEAB[2] and the 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 FCA in the ISO-NE wholesale electricity market.

Energy Efficiency Programs

For over 20 years, Eversource has worked strategically with other Connecticut electric and natural gas utilities to deliver, develop, and implement nationally-recognized energy efficiency programs for Connecticut's businesses, residential customers and government entities to help them control their energy usage, save money and reduce overall electric consumption in the state. These successful programs are funded by three-mill systems benefit charge on customer bills, a Conservation Adjustment Mechanism ("CAM") less gross receipts tax assessed on customer electric bills, and contributions from natural gas customers through a natural gas CAM. In addition, energy efficiency revenues are received from Regional Greenhouse Gas Initiative ("RGGI") auctions and revenue from the ISO-NE Forward Capacity Market ("FCM").

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 NERC, the NPCC, ISO-NE and Eversource reliability standards and criteria.

- 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 remain flat over the 10-year forecast period; however, peak demand is expected to increase by 0.3% 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.

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 2020, and are based on Eversource's total franchise area. The base case or 50/50[3] 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, expected additions due to electric vehicles (EVs) and the electrification of heating systems.

The Reference Plan *Peak Demand* Forecast is also based on an econometric model, adjusted for energy efficiency, solar, expected large customer additions and EVs. 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 flat growth in the weather-normalized CAGR for total electrical energy output requirements of 0.0% for Eversource from 2020- 2030. Without the Company's energy efficiency programs, solar installations, or electric vehicles or heating electrification, the forecasted energy growth rate is also projected to be flat with a weather-normalized CAGR of 0.0%.

The weather-normalized CAGR for summer peak demand in the Reference Plan *Peak Demand* Forecast is forecasted to increase by 0.3% over the ten-year forecast period. Similarly, if Eversource's energy efficiency, solar installations, EVs and our large customer additions were excluded, the increase in the CAGR for forecasted peak demand would be 0.2%.

Table 2-1 provides historic output and summer peaks, actual and normalized for weather, for the 2016-2020 period, and forecast output and peaks for the 2021-2030 periods. The sum of the budgeted class sales for each year, increased 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.

[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%.

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 2011-2020. 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 eight 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 August 2020, which reflects the recent downturn triggered by the global pandemic. 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.

- Global Pandemic – Electrical energy output requirements will be favorably impacted in 2021 compared to 2020 primarily due to the rebound in the commercial sector following the 3-month economic shutdown from April to June 2020. Eversource does not believe the Global Pandemic had a material impact on the actual 2020 summer peak as the higher loads in the residential sector were essentially offset by declines in the commercial sector. The Company does not expect the Global pandemic to impact the peak demand forecast.

- Solar Installations - This forecast includes explicit reductions to electrical energy output requirements due to solar installations stemming from the currently active LREC/ZREC program and the Connecticut Green Bank residential program.

- Energy Efficiency – This forecast includes explicit reductions to electrical energy output and peak demand due to company sponsored energy efficiency based on the most recent 3-year plan.

- Electric Vehicles - This forecast includes explicit additions to electrical energy output requirements and peak demand due to EVs. The EV forecast starts with historical actuals and builds a projection based on national and local market information such as new EV model release plans, state rebate programs and state planned infrastructure investments.

- Large Customers – The peak demand forecast includes explicit adjustments for large customer additions with expected demands greater than 0.25 MW’s.

- Heating Electrification - This forecast includes explicit additions to electrical energy output requirements in the winter months due increasing installations of cold-climate heat pumps. It does not include additions to the peak forecast since the peak occurs in July and there are no heating loads at that time.

- Weather - The Reference Plan Peak Demand Forecast assumes normal weather based on a ten-year average (2011 - 2020). 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 most reasonable, 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 390 MWs, above and below Eversource's 50/50 forecast, which is based on normal weather. To illustrate, the 2030 summer peak forecast reflecting average peak-producing weather is 5,245 MWs.

However, either extremely mild or extremely hot weather could result in a range of potential peak loads from 4,869 MWs to 5,647 MWs. This 775 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 2021 Reference Plan Forecast

	Net Electrical Energy Output Requirements		Net Electrical Peak Loads								
Year	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)
HISTORY											
2016	22460		4948		0.517						
2017	21686	-3.4%	4721	-4.6%	0.524						
2018	22236	2.5%	5045	6.8%	0.503						
2019	21274	-4.3%	4763	-5.6%	0.510						
2020	20635	-3.0%	4802	0.8%	0.489						
Compound Rates of Growth (2016-2020)											
	-2.1%		-0.7%								
HISTORY NORMALIZED FOR WEATHER											
2016	22242		4953		0.511						
2017	21755	-2.2%	5098	2.9%	0.487						
2018	21657	-0.4%	4989	-2.1%	0.496						
2019	21047	-2.8%	4462	-10.6%	0.538						
2020	20585	-2.2%	5090	14.1%	0.460						
Compound Rates of Growth (2016-2020)											
	-1.9%		0.7%								
FORECAST			Reference Plan (50/50 Case)			Extreme Hot Scenario			Extreme Cool Scenario		
2021	20876	1.4%	4972	-2.3%	0.479	5365	5.4%	0.444	4619	-9.3%	0.516
2022	20741	-0.6%	5014	0.8%	0.472	5405	0.7%	0.438	4658	0.9%	0.508
2023	20698	-0.2%	5045	0.6%	0.468	5435	0.6%	0.435	4687	0.6%	0.504
2024	20761	0.3%	5060	0.3%	0.467	5453	0.3%	0.433	4700	0.3%	0.503
2025	20599	-0.8%	5091	0.6%	0.462	5486	0.6%	0.429	4728	0.6%	0.497
2026	20555	-0.2%	5116	0.5%	0.459	5512	0.5%	0.426	4751	0.5%	0.494
2027	20529	-0.1%	5142	0.5%	0.456	5540	0.5%	0.423	4774	0.5%	0.491
2028	20562	0.2%	5173	0.6%	0.452	5573	0.6%	0.420	4803	0.6%	0.487
2029	20521	-0.2%	5207	0.6%	0.450	5607	0.6%	0.418	4834	0.6%	0.485
2030	20546	0.1%	5245	0.7%	0.447	5647	0.7%	0.415	4869	0.7%	0.482
Compound Rates of Growth (2020-2030)											
	0.0%		0.9%			1.6%			0.1%		
Normalized Compound Rates of Growth (2020-2030)											
	0.0%		0.3%			1.0%			-0.4%		

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 (84º mean daily temperature). Forecasted High Peaks are based on the weather that occurred on the 2011 peak day (89º mean daily temperature). Forecasted Low Peaks are based on the weather that occurred on the 2017 peak day (79º 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 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	Heating Electrification	Electric Vehicles	Adjusted Output	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER								
2020							20,585	
FORECAST								
2021	20,975	(83)	(16)	-	11	6	20,876	1.4%
2022	20,909	(142)	(26)	-	17	16	20,741	-0.6%
2023	20,930	(200)	(33)	-	24	25	20,698	-0.2%
2024	21,037	(239)	(37)	-	31	35	20,761	0.3%
2025	20,888	(250)	(39)	-	40	52	20,599	-0.8%
2026	20,855	(262)	(39)	-	49	79	20,555	-0.2%
2027	20,840	(273)	(39)	-	59	109	20,529	-0.1%
2028	20,885	(284)	(39)	-	70	138	20,562	0.2%
2029	20,855	(295)	(39)	-	83	173	20,521	-0.2%
2030	20,891	(307)	(39)	-	96	219	20,546	0.1%
Normalized Compound Rates of Growth (2020-2030)								
	0.1%						0.0%	

50/50 Reference Plan (MW)

Year	Unadjusted Peak	Solar	Company Energy Efficiency	Large Customer Additions	Heating Electrification	Electric Vehicles	Adjusted Peak	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER								
2020							5,090	
FORECAST								
2021	4,960	(20)	(62)	91	-	2	4,972	-2.3%
2022	5,002	(25)	(62)	94	-	4	5,014	0.8%
2023	5,037	(30)	(62)	94	-	6	5,045	0.6%
2024	5,052	(33)	(62)	94	-	9	5,060	0.3%
2025	5,071	(33)	(62)	102	-	13	5,091	0.6%
2026	5,088	(33)	(62)	102	-	20	5,116	0.5%
2027	5,105	(33)	(62)	102	-	30	5,142	0.5%
2028	5,126	(33)	(62)	102	-	40	5,173	0.6%
2029	5,147	(33)	(62)	102	-	53	5,207	0.6%
2030	5,168	(33)	(62)	102	-	69	5,245	0.7%
Normalized Compound Rates of Growth (2020-2030)								
	0.2%						0.3%	

Extreme Hot Weather Scenario (MW)

Year	Unadjusted Peak	Solar	Company Energy Efficiency	Large Customer Additions	Heating Electrification	Electric Vehicles	Adjusted Peak	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER								
2020							5,090	
FORECAST								
2021	5,356	(20)	(62)	91	-	2	5,365	5.4%
2022	5,398	(25)	(62)	94	-	4	5,405	0.7%
2023	5,434	(30)	(62)	94	-	6	5,435	0.6%
2024	5,454	(33)	(62)	94	-	9	5,453	0.3%
2025	5,478	(33)	(62)	102	-	13	5,486	0.6%
2026	5,505	(33)	(62)	102	-	20	5,512	0.5%
2027	5,533	(33)	(62)	102	-	30	5,540	0.5%
2028	5,566	(33)	(62)	102	-	40	5,573	0.6%
2029	5,600	(33)	(62)	102	-	53	5,607	0.6%
2030	5,639	(33)	(62)	102	-	69	5,647	0.7%
Normalized Compound Rates of Growth (2020-2030)								
	1.0%						1.0%	

2.2 ISO-NE Wholesale Electric Markets

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

The fifteenth FCA took place on Monday, February 8, 2020. Virtually all the information about FCA 14 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/2021/02/20210211_pr_fca15_initial_results.pdf

Holyoke, MA—February 11, 2021—New England's annual capacity auction for power system resources concluded Monday with sufficient resources to meet peak demand in 2024-2025, with preliminary clearing prices ranging from $2.48 per kilowatt-month (kW-month) to $3.98 kW-month across different pricing zones. ISO New England Inc. runs the auction to procure the resources needed to meet consumer demand for electricity in three years.

The 15th auction of the Forward Capacity Market (FCA 15) cleared three separate prices because of local capacity requirements within New England. For this auction, the region was divided into four zones: Northern New England (NNE), made up of Vermont, portions of Maine and New Hampshire; "Nested" Maine, referring to the remainder of Maine; Southeast New England (SENE), comprising Northeastern Massachusetts, Greater Boston, Southeastern Massachusetts, and Rhode Island; and Rest of Pool (ROP), which includes Connecticut and western and central Massachusetts.

Capacity zones are developed to align with power system transmission constraints. They signal areas of the system with a potential shortfall or surplus of capacity. Multiple zones help to ensure that capacity is located and priced appropriately. The preliminary clearing prices for FCA 15 are: $3.98 kW-month in the SENE zone, $2.61 kW-month in the Rest-of-Pool zone, and $2.48 kW-month in the NNE and Maine zones.

"The clearing prices in FCA 15 reveal the different values across the region based on the individual capacity needs for each zone," said Robert Ethier, vice president for system planning at ISO New England. "In addition, new this year is a large amount of energy storage—almost 600 megawatts (MW)—that has cleared the market."

Resources totaling 40,692 MW, including 33,662 MW of existing capacity and 219 new resources totaling 7,030 MW, qualified to participate in FCA 15, while the regional capacity target for 2024-2025 is 33,270 MW.

The auction concluded with capacity commitments of 34,621 MW to be available in 2024-2025, with 1,351 MW of surplus supply over the net installed 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 2,525 MW of new resources within New England secured obligations during the auction. Of this total, approximately 19 MW received their obligations under the renewable technology resource (RTR) designation, which remained from prior auctions. The RTR designation allowed a limited amount of renewable resources to participate in the auction without being subject to the minimum offer-price rule. FCA 15 marked the final year of the RTR exemption. Almost 600 MW have come into the market under the RTR designation since FCA 9, the first auction for which the RTR designation applied.

Preliminary results of FCA 15:

• The primary auction cleared for all resources after five rounds of competitive bidding.

• Previous clearing prices (all per kilowatt-month): FCA 10 (2016), $7.03; FCA 11 (2017), $5.30; FCA 12 (2018), $4.63; FCA 13 (2019), $3.80; FCA 14 (2020), $2.00. For earlier auction clearing prices, please go to the ISO website: Markets (iso-ne.com).

• The total value of the capacity market in 2024-2025 will be approximately $1.36 billion (preliminary estimate).

• Capacity clearing the auction totaled 34,621 MW to meet the 33,270 MW net installed capacity target for 2024-2025:

  - 29,243 MW of generation, including 950 MW of new resources
  - 3,891 MW (including 170 MW new) of demand resources, including energy efficiency, load management, and distributed generation resources
  - More than 630 MW of new plus existing battery storage
  - 1,487 MW of total imports from New York, Québec, Canada, and New Brunswick, Canada

• Prior to FCA 15, 199 MW of resources submitted retirement bids, while an additional 43 MW of resources submitted permanent de-list bids to leave the capacity market; 101 MW of these de-list bids were cleared before the auction, and 141 MW were cleared during the auction.

Chapter 3: ENERGY EFFICIENCY

Chapter Highlights

- Energy savings resulting from Connecticut Energy Efficiency Fund ("Fund") programs are the most cost- effective and reliable resource for Connecticut's energy policymakers and stakeholders. The programs help Connecticut residents, businesses, and local/state government reduce their energy bills and help mitigate peak energy prices.
- Fund programs are nationally recognized nationally and are perennially ranked in the top 10 states for energy efficiency and demand management. Connecticut's Electric Companies (Eversource and United Illuminating) and Natural Gas Companies (Eversource, Connecticut Natural Gas, and Southern Connecticut Gas) develop and implement Fund programs.
- • Connecticut's energy efficiency and demand management strategies are designed to help the state in its efforts to reduce greenhouse gas ("GHG") emissions that result from energy usage in residential and C&I buildings, and to provide economic development benefits.

3.1 Connecticut's Energy Efficiency Programs

Energy efficiency is a cost-effective resource available to policymakers to address rising energy costs, reliability challenges, and increasing GHG emissions. Connecticut's energy efficiency and demand management programs reduce the amount of energy used by residential and commercial and industrial ("C&I") customers. This helps to decrease energy demand from power plants, reduce the amount of GHG emissions emitted due to power generation, and helps to lower customers' energy bills across all sectors. Energy efficiency and demand management programs also provide economic development benefits for Connecticut and helps 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 and demand management programs. Since 2000, the American Council for an Energy Efficiency Economy ("ACEEE") has ranked Connecticut as one of the top 10 states for energy efficiency. In the ACEEE's *2020 State Energy Efficiency Scorecard*, Connecticut ranked seventh in the nation. This ranking reflects the success and expertise of Connecticut's electric and natural gas utilities ("Companies") in developing and administering innovative energy efficiency programs.

Eversource with guidance from the Energy Efficiency Board ("EEB"), maintains their energy efficiency and demand management programs' success through a flexible and 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 ally and professional affiliations, retail partnerships, teacher trainings, museum partnerships, and marketing, Eversource is helping to shape a more efficiency-minded consumer that not only participates in award-winning programs, but who makes wise energy choices every day.

3.2 Legislative History

The Connecticut General Assembly passed Public Act 98-28—An Act Concerning Electric Restructuring in 1998 and established the Fund, initially serving solely electric residential and

C&I customers across the state. In addition, Public Act 98-28 established the EEB to advise Connecticut's Electric Companies in developing their annual energy efficiency and load management plans. In 2005, Public Act 05-01—An Act Concerning Electricity and Energy Efficiency was passed created a funding mechanism for Natural Gas Companies to develop and implement cost-effective energy efficiency programs to reduce natural gas consumption. In 2007, new legislation called for the Companies to pursue "all cost-effective energy efficiency" with the passage of Public Act 07-242—An Act Concerning Electricity and Energy Efficiency. This legislation envisioned energy efficiency as the focal point for statewide energy policy.

In 2011, the Connecticut General Assembly passed Public Act 11-80, which laid the groundwork for pursuing "all cost-effective energy efficiency" and required the newly-created Department of Energy and Environmental Protection ("DEEP") to prepare a Comprehensive Energy Strategy for Connecticut every three years. Additionally, Public Act 11-80 established ambitious energy-saving targets for the state, including weatherizing 80 percent of Connecticut's residential homes by 2030. In 2013, due to passage of Public Act 13- 298, *An Act Concerning Implementation of Connecticut's Comprehensive Strategy and Various Revision to the Energy Statutes*, the Companies were required to develop three-year plans for energy efficiency and demand management programs. The first three-year plan was filed on November 1, 2015—the 2016-2018 Conservation & Load Management Plan ("2016-2018 Plan").

3.3 Conservation & Load Management Plans

During the 2016-2018 Plan, the Companies saw significant funding for Fund programs diverted to the state's General Fund through the Connecticut General Assembly's passage of June Special Session Public Act 17-2, An Act Concerning the State Budget for the Biennium Ending June 30, 2019, Making Appropriations Therefor, Authorizing and Adjusting Bonds of the State and Implementing Provisions of the Budget ("SS Public Act 17-2") on October 31, 2017. June SS Public Act 17-2 diverted $63.5 million per year for Fiscal Year 2018 and 2019 from the Fund and diverted an additional $10 million per year in proceeds from the RGGI's carbon trade auctions. These diversions negatively impacted Connecticut's Energy Efficiency Portfolios for 2017, 2018, and 2019.

The 2019-2021 Conservation & Load Management Plan ("2019-2021 Plan") is the second three-year plan developed after the passage of Public Act 13-228[1]. On December 20, 2018, DEEP approved the 2019 – 2020 Plan submitted on November 18, 2018. 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. The Plan included unprecedented levels of funding for both electric and natural gas energy efficiency programs based on Public Act 13-298. For the 2019-2021 term, the Companies saw partial restoration of funds for Program Year 2019, and full funding restored for Program Years 2020 and 2021. These budget restorations are a direct result of the Connecticut General Assembly's passage of Public Act 18-50—An Act Concerning Connecticut's Energy Future[2]. Public Act 18-50 also changed the structure of how energy efficiency programs are funded in the state to help deter future funding diversion efforts.

The 2019-2021 Plan was based upon input from members of the public, industry groups, and

[1] 2019-2021 Plan, filed Nov. 19, 2018, available online at: https://portal.ct.gov/-/media/DEEP/energy/ConserLoadMgmt/Final20192021CLMPlan111918pdf.pdf?la=en&hash=891F955EDEADB86FA2414AC6A6AC4772.

[2] Public Act 18-50, An Act Concerning Connecticut's Energy Future. Approved May 24, 2018. Also known as Senate Bill 9 ("SB 9") Available at: https://www.cga.ct.gov/2018/act/pa/pdf/2018PA-00050-R00SB-00009-PA.pdf.

private enterprise, and was developed in collaboration with the EEB and its consultants, the Companies, DEEP, and other stakeholders. The 2019-2021 Plan included unprecedented levels of funding for both electric and natural gas energy efficiency programs based on Public Act 13-298.

Funding

Funding for energy efficiency and demand management 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[3]. Public Act 11-80 and the subsequent DEEP approval of the 2019-2021 Plan provide an additional 3 mil Conservation Adjustment Mechanism ("CAM") charge for conservation. In addition, Fund programs receive funding from other sources including the ISO-NE's FCM and from RGGI.

2019-2021 Plan Priorities

In mid-March 2020, the Electric and Natural Gas Companies had to quickly shift gears with the onset of the COVID-19 pandemic and the suspension of in-home and on-premises services from March 17 to mid-June 2020. This resulted in a significant impact on customers, contractors, the Electric and Natural Gas Companies, and the goals set forth in the 2019-2021 Plan and the 2020 Plan Update. The pandemic-related impacts on Connecticut's energy efficiency and demand management programs will continue into the 2021 term, and will affect the Electric and Natural Gas Companies', the EEB's, and DEEP's planning for the next triennial filing—the 2022-2024 Conservation & Load Management Plan.

Eversource and the other Companies filed the 2021 Plan Update to the 2019-2021 Plan on November 1, 2020. The 2021 Plan Update focuses on the seven priorities laid out in the 2019-2021 Plan:

1. Advance state energy and environmental policy goals.
2. Offer tailored solutions for market segments while ensuring equitable distribution.
3. Focus on direct savings to customers.
4. Develop and maintain a sustainable workforce.
5. Continuous commitment to deliver comprehensive energy efficiency strategies.
6. Implement effective demand reduction strategies.
7. Continue to explore and implement financing options.

3.4 Ten-Year C&LM Forecast

Table 3-1 presents the potential cumulative annualized energy savings and summer and winter peak-load reductions forecasted for energy efficiency programs implemented in Eversource's (f/k/a CL&P) service territory for the 2019-2021 Plan budget. The forecast is based on anticipated savings from the 2021 Update to the 2019-2021 Plan. Forecasted savings beyond 2021 assume 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 due to market transformation, stringent building codes, and federal standards.

[3] Conn. Gen. Stat. § 16-245m.

Forecast Sensitivity

Connecticut's energy efficiency and demand management programs utilize a complementary mix of lost opportunity, retrofit, and market transformation implementation strategies to achieve energy 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.

Table 3-1

CL&P C&LM Programs Annual Energy Savings
and
Peak Load Reduction by Customer Class

Connecticut Light and Power

2021-2030

GWh Sales Saved

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	49	89	123	153	178	200	219	228	236	243
Commercial	118	174	220	262	300	334	365	393	417	440
Industrial	35	52	66	79	90	100	109	118	125	132
Total	**202**	**315**	**410**	**494**	**568**	**635**	**694**	**738**	**778**	**815**

MW Reductions (Passive Resource Summer Impacts)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	8	14	18	22	25	28	30	32	33	33
Commercial (non-Load Response)	14	21	27	32	36	40	44	47	50	53
Industrial (non-Load Response)	4	6	8	9	11	12	13	14	15	16
Total	**27**	**41**	**53**	**63**	**72**	**80**	**88**	**93**	**98**	**102**

MW Reductions (Passive Resource Winter Impacts)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	13	22	29	34	40	44	48	50	52	53
Commercial (non-Load Response))	17	25	32	38	43	48	52	56	60	63
Industrial (non-Load Response)	5	7	9	11	13	14	16	17	18	19
Total	**35**	**54**	**70**	**83**	**96**	**106**	**116**	**123**	**130**	**135**

Notes:

1) Table 3-1 includes only passive resources. It does not include 72.2 MW of Active Demand Response ("ADR") resources that is planned during the 2019-2021 term.
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 the 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 NPCC, ISO-NE and Eversource reliability standards and criteria.

On December 20, 2012, the FERC issued a final ruling (FERC Order 773) 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 ROFR for incumbent transmission providers.

On March 27, 2020 NPCC approved revisions to the Criteria A-10 "Classification of Bulk Power System Elements" that requires a more targeted approach to how bulk power system elements 69-kV and above are identified and classified as critical elements, and included on the NPCC Bulk Power System list. Key revisions that were approved eliminated the automatic inclusion of system elements on the Bulk Power List and introduced a test that will allow NPCC members to exclude elements that are impactful to Bulk Power Transfer and inter area reliability. It is expected that future regional and local studies conducted by ISO-NE, New England and, Transmission owners will include the revised Criteria A-10.

4.3 Transmission Planning Process

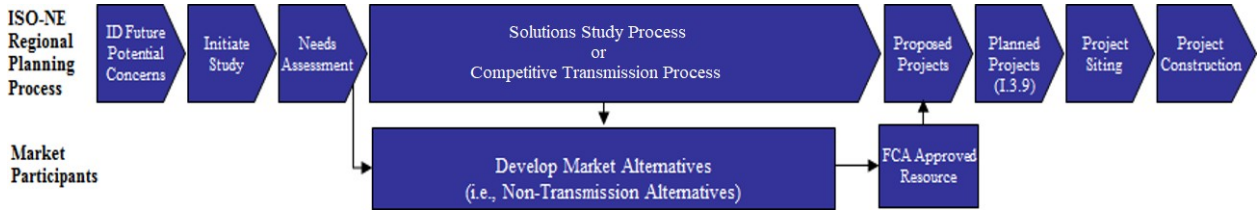
Within the ISO-NE regional planning process established for compliance with NERC and NPCC planning standards, ISO-NE performs reliability assessment studies of the New England transmission system. Individual sub-area studies ("Needs Assessments") are performed to identify system needs over a ten-year horizon. When a system reliability problem is identified from a needs assessment, ISO-NE first determines whether the system reliability problem exists under current conditions or is expected to develop within three years. If these criteria are met, ISO-NE and the 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. If the system reliability problem is not expected to materialize until more than three years from the completion of the Needs Assessment, ISO-NE would use its competitive transmission development process to solicit regulated transmission solutions from any qualified developer, including Eversource.

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 ISO-NE recommends a proposed transmission project to the Planning Advisory Committee. In parallel, market participants can develop and propose Non-Transmission Alternatives to resolve the identified needs.

These transmission studies, and the transmission solutions, are documented in a series of reports prepared by ISO-NE, and in aggregate, provide a basis for updating RSP as depicted in the sequence of the process below:

Transmission Planning Process Figure 1



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 ("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 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. Eversource has since successfully constructed and placed the SWCT 2022 Solution in service at the end of 2020.

- 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. Eversource has since successfully constructed and placed the

Greenwich Substation and Line project in service at the end of 2020.

- The Eastern Connecticut ("ECT") 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 evaluating the siting strategy for the various components of the Eastern Connecticut solution, as may be required. In May of 2018, ISO-NE completed a 2027 Needs Assessment that analyzed the performance of the sub- area. In March of 2019, ISO-NE announced a re-assessment of the Eastern Connecticut Needs due to the reduction of load resulting from the 2018 and 2019 CELT Report load forecasts. The Eastern Connecticut 2029 Needs Assessment results were presented to ISO- NE PAC in September of 2019. ISO-NE subsequently presented the ECT 2029 Preliminary Preferred Solution1 at the May 20, 2020 Planning Advisory Committee ("PAC") meeting. A draft ECT 2029 Solutions Study was then posted on June 3, 2020 and the final version on June 19, 2020 on ISO-NE's external website. This report established the preferred solution to address the identified time-sensitive needs for the ECT area.

- 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 if 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. Eversource has since successfully constructed and placed the GHCC preferred Solution in service at the end of 2020. 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.

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
Northeast Simsbury	Simsbury	Canton	Canton	115	2021	N/A	Line Structure Replacements	Under Construction
Manchester	Manchester	South Windsor	South Windsor	115	2021	N/A	Line Structure Replacements	Under Construction
Manchester	Manchester	Rood Ave	Windsor	115	2021	N/A	Line Structure Replacements	Under Construction
South Windsor	South Windsor	Barbour Hill	South Windsor	115	2021	N/A	Line Structure Replacements	Under Construction
Mystic	Stonington	Shunock	North Stonington	115	2021	N/A	Line Structure Replacements	Under Construction
Berlin	Berlin	Westside	Middletown	115	2021	N/A	Line Structure Replacements	Under Construction
Haddam	Haddam	Pratt & Whitney	Middletown	115	2021	N/A	Line Structure Replacements	Under Construction
Killingly	Killingly	Brooklyn Fry Brook Tunnel	Danielson Plainfield Preston	115	2021	N/A	Laminated Structure Replacements	Under Construction
Millstone	Waterford	Manchester	Manchester	345	2021	N/A	Line Structure Replacements	Under Construction
Montville	Montville	Haddam Neck	Haddam	345	2021	N/A	Line Structure Replacements	Under Construction
Millstone	Waterford	Card	Lebanon	345	2021	N/A	Line Structure Replacements	Under Construction
Scovill Rock	Middletown	East Shore	New Haven	345	2021	N/A	Line Structure Replacements	Under Construction
Barbour Hill	South Windsor	Ludlow (MA)	Ludlow (MA)	345	2021	N/A	Line Structure Replacements	Under Construction
Beseck	Wallingford	Southington	Southington	345	2021	N/A	Line Structure Replacements	Under Construction
Card	Lebanon	Lake Road	Killingly	345	2021	N/A	Line Structure Replacements	Under Construction
Southington	Southington	Wallingford	Wallingford	115	2021	N/A	Line Structure Replacements	Under Construction
Northeast Simsbury	Simsbury	Canton	Canton	115	2021	N/A	Line Structure Replacements	Under Construction
Rocky River	New Milford	West Brookfield	Brookfield	115	2021	N/A	Line Structure Replacements	Under Construction
Campville	Harwinton	Canton Franklin Drive	Canton Torrington	115	2021	N/A	Line Structure Replacements	Under Construction
West Side	Middletown	Berlin	Berlin	115	2021	N/A	Line Structure Replacements	Under Construction
Dooley	Middletown	West Side	Middletown	115	2021	N/A	Line Structure Replacements	Under Construction
Tunnel	Preston	SCRRA	Preston	115	2021	N/A	Replace Copper Conductor and Shield Wire	Concept
Barbour Hill	South Windsor	Rockville	Vernon	115	2021	N/A	Replace Copper Conductor and Shield Wire	Concept
Bristol	Bristol	Forestville	Bristol	115	2021	N/A	Copper and Shield Wire Replacement	Proposed

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	Status
Montville	Montville	Gales Ferry	Ledyard	69	2021	2.4	Line Rebuild to allow operation at 115-kV	Proposed
Ledyard Jct.	Ledyard	Buddington (CMEEC)	Groton	69	2021	1.8	Line Rebuild to allow operation at 115-kV	Proposed
Ledyard Jct.	Ledyard	Gales Ferry	Ledyard	69	2021	1.6	Line Rebuild to allow operation at 115-kV	Proposed
Montville	Montville	Card	Lebanon	115	2021	N/A	Split 1000/1080 DCT for QP588	Planned
Southington	Southington	Black Rock	New Britain	115	2022	N/A	Replace Structures and Copper Conductor	Concept
Barbour Hill	South Windsor	Enfield Windsor Locks	Enfield Windsor Locks	115	2022	N/A	Replace Shield Wire	Concept
Southington	Southington	Black Rock	New Britain	115	2022	N/A	Copper Conductor Replacement /Rebuild	Concept
Barbour Hill	South Windsor	Enfield Windsor Locks	Enfield Windsor	115	2022	N/A	Copper and Shield Wire Replacement	Concept
Stevenson	Monroe	Pootatuck	Shelton	115	2022	N/A	Copper and Shield Wire Replacement	Proposed
Devon	Milford	South Naugatuck	Naugatuck	115	2022	N/A	Copper and Shield Wire Replacement	Proposed
North Wallingford	Wallingford	Colony	Wallingford	115	2022	N/A	Copper and Shield Wire Replacement	Proposed
Plumtree	Bethel	Stony Hill Shepaug	Brookfield Southbury	115	2022	N/A	Copper and Shield Wire Replacement	Proposed
Frost Bridge	Watertown	Noera	Waterbury	115	2022	N/A	Copper and Shield Wire Replacement	Proposed
Millstone	Waterford	Manchester	Manchester	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Manchester	Manchester	Card	Lebanon	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Card	Lebanon	Millstone	Waterford	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Scovill Rock	Middletown	East Shore	New Haven	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Southington	Southington	Scovill Rock	Middletown	345	2022	N/A	Line Structure and Insulator Replacements	Proposed

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	Status
Manchester	Manchester	Kleen	Middletown	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Beseck	Wallingford	Southington	Southington	345	2022	N/A	Line Structure and Insulator Replacements	Proposed
Card	Lebanon	Lake Road	Killingly	345	2022	N/A	Line Structure Replacements	Proposed
Tunnel	Preston	Ledyard Jct.	Ledyard	69	2022	8.6	Line Rebuild to allow operation at 115-kV	Proposed
Mystic	Stonington	Shunock	North Stonington	115	2022	N/A	Install a Series Reactor	Proposed
Darien	Darien	Fitch St. (CMEEC)	Norwalk	115	2023	N/A	Line Relocation	Proposed
Sherwood	Westport	South Norwalk (CMEEC)	Norwalk	115	2023	N/A	Line Relocation	Proposed
Montville	Montville	Bean Hill	Norwich	115	2023	N/A	Line Structure Replacements	Proposed
North Bloomfield	Bloomfield	Northeast Simsbury	Simsbury	115	2023	N/A	Line Structure Replacements	Proposed
Montville	Montville	Tunnel Card Lisbon	Preston Lebanon Norwich	115	2023	N/A	Line Structure Replacements	Proposed
Stevenson	Monroe	Sandy Hook	Newtown	115	2023	N/A	Line Structure Replacements	Proposed
Montville	Montville	Mystic Buddington	Stonington Groton	115	2023	N/A	Line Structure Replacements	Proposed
Montville	Montville	Buddington	Groton	115	2023	N/A	Line Structure Replacements	Proposed
Northwest Hartford	Hartford	North Bloomfield Rood Avenue	Bloomfield Windsor	115	2023	N/A	Line Structure Replacements	Proposed
Bloomfield	Bloomfield	Northwest Hartford	Hartford	115	2023	N/A	Line Structure Replacements	Proposed
Southington	Southington	Todd	Wolcott	115	2023	N/A	Line Structure Replacements	Proposed
Card	Lebanon	Willimantic	Windham	115	2023	N/A	Line Structure Replacements	Proposed
Southington	Southington	Hanover	Meriden	115	2023	N/A	Copper Retirement	Concept
Mystic	Stonington	Shunock	North Stonington	115	2023	N/A	Line Structure Replacements	Proposed
Montville	Montville	QP788	Montville	69	2023	N/A	Gen-Tie Line for QP788	Proposed
Card	Lebanon	Lake Road	Killingly	345	2023	N/A	Sectionalize Tap for QP724	Planned
Tunnel	Preston	Ledyard Jct.	Ledyard	69	2024	8.6	Line Rebuild to allow operation at 115-kV for QP831	Proposed
Killingly	Killingly	QP831	Killingly	345	2024	N/A	Gen-Tie Line for QP831	Proposed

Table 4-2: Eversource Proposed Substation Projects in Connecticut

Substation	City or Town	Voltage kV	ISD	Project Description	Status
Franklin Drive	Torrington	115/13.2	2021	Replace both distribution transformer	Concept
Manchester	Manchester	345 and 115	2021	Manchester Control House Expansion	Under Construction
Quinebaug	Plainfield	115	2021	Add a new 3-breaker Bus switching station for generator (QP588)	Planned
Millstone	Waterford	345	2021	Insulator Replacements	Under Construction
Newington	Newington	115/23	2021	Replace Transformer (1x)	Proposed
Newington	Newington	115/23	2021	Replace Transformer (3x)	Proposed
Glenbrook	Stamford	115	2021	Replace STATCOM	Under Construction
Rood Ave	Windsor	115/23	2022	Add a distribution transformer	Planned
Carmel Hill	Woodbury	115/23	2022	Add a distribution Transformer	Concept
Sandy Hook	Newtown	115/23	2022	Add a distribution transformer	Concept
Falls Village	Canaan	69/13.2	2022	Replace transformer	Concept
Southington	Southington	115	2022	Replace Relays	Under Construction
Killingly	Killingly	115	2022	Install Capacitor and Breaker	Proposed
Montville	Montville	345	2022	Install one 345-kV Breaker	Proposed
Gravel Pit	East Windsor	115	2022	Construct substation QP892	Proposed
Cotton Bridge	Killingly	345	2023	Construct substation for QP724	Planned
Mansfield	Mansfield	115/23	2023	Add a distribution transformer	Planned
Bokum	Old Saybrook	115/27.6	2023	Replace Transformers	Concept
Southington	Southington	115/13.8	2023	Replace Transformer	Concept
Card	Lebanon	345/115	2023	Install 2nd Autotransformer	Proposed
Card	Lebanon	115	2023	Upgrade Card to BPS standards	Proposed
Card	Lebanon	115	2023	Install one Breaker	Proposed
Gales Ferry	Gales Ferry	69	2023	Convert from 69-kV to 115-kV	Proposed
Montville	Montville	69	2023	Install breaker and MOD for QP788	Proposed
Canterbury	Canterbury	115	2023	Install breaker for QP787	Proposed
Salisbury	Salisbury	69/13.2	2024	Replace Transformer	Concept
Skungamaug	Coventry	69/13.8	2024	Replace Transformer	Concept
Peaceable	Redding	115/13.8	2024	Replace Transformers	Concept
Bunker Hill	Waterbury	115	2024	Reconfigure substation to a 6-breaker ring bus	Concept
Shunock	Mystic	115	2024	Install a Synchronous Condenser and two Breakers	Proposed
Killingly	Killingly	115	2024	Add two breakers for QP831	Proposed

4.6 Incorporation of Renewables on the Eversource Transmission and Distribution System

There is a significant amount of solar PV and offshore wind development in southern New England that is supported in part by Eversource's transmission and distribution system in Connecticut.

Solar PV interconnections in Connecticut are increasing at a rapid pace, due largely to the LREC/ZREC and other financing programs noted in Section 2.1.1. Most PV systems are interconnecting to the distribution system, prompting the need for modernizing the electric distribution system (DPU Docket No. 17-12-03).

Offshore wind interconnections are impacting the Eversource T&D system in Connecticut both as physical interconnections to the grid in Connecticut, and as energy contracts with offshore wind projects located in other areas. DEEP, through competitive RFPs, secured offshore wind projects that will provide approximately 19% of the state's electricity supply, although none of those projects are interconnecting to the electric system in Connecticut.

Deepwater Wind's Revolution Wind project is a joint venture offshore wind project by Eversource Energy and Ørsted. This project will be interconnected to a switching station in the state of Rhodes Island, and will provide approximately 5% of the electrical supply in the state of Connecticut.

Vineyard Wind's Park City Wind project is an 804 MW offshore wind project that was selected as part of the 2019 RFP. This project will make a landfall in Barnstable County, MA and is expected to provide approximately 14% of the electrical supply of the Connecticut.

In addition to these projects, there are two offshore wind projects that have submitted their interconnection request to ISO-NE. QP893/QP927 is a 1200 MW project that is proposing to interconnect to the coast of Eastern and or Central Connecticut. QP791/QP792 is an 805 MW project that is proposing to interconnect to the same locations in Connecticut. These projects combined could provide approximately 35% of the electrical supply in the state of Connecticut, but the energy from these projects could be purchased by other states in the region in the same way that Connecticut has purchased energy from projects interconnecting to Rhode Island and Massachusetts.

The offshore wind projects in New England are in various level of regulatory approval process, contract negotiations, and system impact studies. However, the two projects that are selling energy to Connecticut have contracts approved by PURA.

Eversource will continue to monitor and incorporate these projects in the reliable planning of the electrical system in Connecticut. There are activities underway to address the integration of all these clean energy resources. ISO-NE has initiated a cluster study to address the interconnection of significant amounts of offshore wind on Cape Cod, some of which plans to sell energy to Connecticut. ISO-NE has also initiated a pilot study to assess potential modifications to the reliability planning process to address the integration of clean energy resources. CT DEEP's Draft Integrated Resource Plan found that electric transmission is an essential part of integrating enough clean energy to meet state targets, and DEEP has recommended that the region undertake a coordinated, scenario-based approach to planning the future electric grid.