Connecticut Light & Power

The Northeast Utilities System

2012 Forecast of Loads and Resources

For the Period 2012-2021

March 1, 2012

Northeast Utilities

107 Selden Street, Berlin, CT 06037

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March 1, 2012

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

Re: CL&P 2012 Forecast of Loads and Resources for the Period 2012-2021

Dear Mr. Stein:

Submitted herewith, on behalf of The Connecticut Light and Power Company ("CL&P" or the "Company"), are 20 copies of the Company's 2012 Forecast of Loads and Resources, as required by Section 97 of Public Act 11-80.

This Forecast is available for review by the public during normal business hours at the principal office of Northeast Utilities Service Company, Regulatory Planning & Policy Department, 107 Selden Street, Berlin, Connecticut. Arrangements for viewing the Report can be made by calling Ms. Tyra Anne Peluso at (860) 665-2674.

Please contact me (860-665-5967) if you have any questions with respect to this filing.

Very truly yours,

Christopher R. Bernard

Christopher R. Bernard
Manager, Regulatory Policy & Planning
Northeast Utilities Service Company
As Agent for CL&P

Enclosure

cc: Kimberley J. Santopietro, PURA

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List of Acronyms

"ARRA"	American Reinvestment and Recovery Act of 2009
"C&LM"	Conservation and Load Management
"CAGR"	Compound Annual Growth Rate
"CCEF"	Connecticut Clean Energy Fund
"CEAB"	Connecticut Energy Advisory Board
"CEEF"	Connecticut Energy Efficiency Fund
"CL&P"	The Connecticut Light & Power Company
"CSC"	Connecticut Siting Council
"CMEEC"	Connecticut Municipal Electric Energy Cooperative, Inc.
"DPUC"	Department of Public Utility Control
"DSM"	Demand Side Management
"EDC"	Electric Distribution Company
"ERO"	Electric Reliability Organization
"FCA"	ISO-NE Forward Capacity Auction
"FCM"	ISO-NE Forward Capacity Market
"FERC"	Federal Energy Regulatory Commission
"FLR"	Forecast of Loads and Resources
"FMCC"	Federally Mandated Congestion Charge
"IRP"	Integrated Resource Plan
"IPR"	Intermittent Power Resource
"ISD"	In-Service Date
"ISO-NE"	Independent System Operator - New England
"kW"	Kilowatt or 1,000 Watts
"MW"	Megawatt or 1,000,000 Watts
"NEEWS"	New England East — West Solution
"NERC"	North American Electric Reliability Corporation
"NTA"	Non-Transmission Alternative
"PA 05-01"	Public Act 05-01, An Act Concerning Energy Independence
"PA 07-242"	Public Act 07-242, An Act Concerning Electricity and Energy Efficiency
“PA 11-80”	Public Act 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection (“DEEP”)
"Project ISO"	State Program to Procure 150 MW of Class I Renewable Generation Resources
"REC"	Renewable Energy Certificate
"RGGI"	Regional Greenhouse Gas Initiative
"RPS"	Renewable Portfolio Standards
"RSP"	ISO-NE's Regional System Plan
"SWCT"	ISO-NE Southwest Connecticut Zone
"UI"	The United Illuminating Company
"WMECO"	Western Massachusetts Electric Company

Chapter 1: INTRODUCTION

1.1 Overview of CL&P's 2012 Forecast of Loads and Resources Report

The Connecticut Light & Power Company ("CL&P") is a company engaged in electric distribution and transmission services in Connecticut, as defined in Conn. Gen. Stat. §16-1. As such, CL&P has prepared this Ten-Year Forecast of Loads and Resources ("FLR") pursuant to Conn. Gen. Stat. §16-50r. CL&P has provided an annual FLR to the Connecticut Siting Council ("CSC") for over thirty years. This 2012 FLR includes the following information.

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 CL&P's Conservation and Load Management Programs ("C&LM") during that period.
3. A list and discussion of planned transmission lines on which proposed route reviews are being undertaken or for which certificate applications have already been filed.
4. For each generating facility that generated more than one megawatt from which CL&P purchased power, a statement of the name, location, size, type of the generating facility, fuel consumed by the facility, and the by-product of the consumption.

1.2 Energy and Peak Demand Forecasts

There is uncertainty in any forecast and it should be noted that weather can have a large impact on the realization of any forecast. CL&P's electric energy usage is expected to increase by a weather-normalized compound annual growth rate (CAGR) of 0.4% per year and peak demand is expected to grow by 0.7% per year over the 10-year forecast period from 2012 through 2021.

While CL&P is providing its forecast developed for financial forecasting purposes, CL&P uses ISO-NE's load forecast for transmission planning purposes. Further discussion of CL&P'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, CL&P was ordered to sell 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 ("PA 07-242")*, directed the annual development of an integrated resource plan ("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 ("DEEP") and Planning for Connecticut's Energy Future ("PA 11-80".)* PA 11-80 calls for DEEP to create an Integrated Resource Plan for Connecticut ("IRP") by January 1, 2012 and biennially thereafter, in consultation with CEAB and the EDCs.

On January 17, 2012, DEEP issued its Draft 2012 IRP identifying two primary recommendations: 1) increase energy efficiency program spending and 2) increase flexibility to meet renewable energy targets.

ISO-NE Wholesale Electric Markets and State Procurement of Generation Resources

Section 2.3 of this report discusses the results of the most recent forward capacity auction in the ISO-NE wholesale electricity market. In the past, Connecticut has taken action to procure renewable, peaking and capacity resources through state run solicitations for these resources that result in contracts for electric product sales to the EDCs. The state oversees the procurement processes, including determination of what resources to procure and in what amounts. The EDCs then enter into and administer these contracts for these resources with the State's selected electric suppliers (see Section 2.2).

Conservation and Load Management Programs

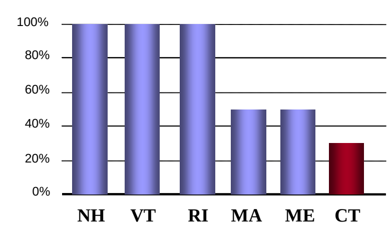
For many years, CL&P has been developing and implementing nationally recognized Conservation and Load Management ("C&LM") programs for its customers to help them control their energy usage, save money and reduce overall electric consumption in the state. These successful programs are primarily funded by a 3 mil per kWh charge on customer bills, as well as revenues received from Regional Greenhouse Gas Initiative ("RGGI") auctions and the sale of Renewable Energy Credits ("REC"). Further discussion of CL&P's C&LM program forecast can be found in Chapter 3. The 2012 C&LM Plan includes a discussion of a ramp up of programs consistent with the Malloy Administration's goal to make Connecticut number one in the nation in energy efficiency.

Transmission Planning

CL&P plans, builds and operates transmission infrastructure with a long-term vision to safely and reliably deliver power to its customers, under a wide variety of supply and demand conditions. A detailed discussion of CL&P's transmission forecast can be found in Chapter 4.

- CL&P is responsible to meet reliability standards mandated by FERC and implemented by NERC, and faces severe financial penalties of up to $1 million per day for *each* non-compliance occurrence.
- Among all the New England states, Connecticut is the least able to serve its peak load using power imports.
- Connecticut imports are currently limited by its transmission system to a range of 300 MW to 2,500 MW – or up to about 30% of the state's peak load.
- Consequently, at least 70% of the electric power needed to serve customer peak demand must be generated in Connecticut.

Percentage of Peak Load that Could Be Served by Transmission Imports



Note: Chart uses approximate values based on known interface limits.

- Regional environmental requirements such as Renewable Portfolio Standards ("RPS") and Federal EPA may necessitate looking beyond New England for low-emissions and renewable resources.
- Potential Federal EPA legislation restricting the output of "greenhouse gasses" and or water and air quality may lead to a change in the generation mix in Connecticut. Uncertainty in Connecticut environmental mandates and the future effect on generator locations because of renewables integration and air/water quality constraints will play key roles on resource adequacy and reliability in the future.
- The potential to develop large quantities of renewable resources, like solar, wind and hydroelectric power, is very low in Connecticut, but wind and hydroelectric power have greater development probability in northern New England and Canada.

- The prospect of transporting renewable energy from northern New England and Canada to southern New England is particularly promising. Northeast Utilities, the parent company of CL&P, is currently developing a transmission project with NSTAR and Hydro-Quebec that would enable imports of up to 1,200 MW of low-carbon power generated in Canada.
- FERC Order 1000 on "Transmission Planning and Cost Allocation" was issued on July 21, 2011. The order provides for consideration of transmission needs driven by public policy requirements in the local and regional planning process including mandates that require utilities and RTOs to prepare and submit compliance filings. The state of Connecticut along with other stakeholders is helping ISO-NE to develop this compliance filing.

1.4 Chapter 1 Review

Despite the complicated mix of the recession, market pressures and market participants - much different from the landscape when the legislature originally required companies to provide an annual Forecast of Loads and Resources ("FLR") - Connecticut is expected to see a moderate rise in electric energy consumption and peak demand over the forecast period, but not a lack of generation resources. While CL&P's 2011 FLR indicates that there will be adequate generation resources for the forecast period, possible generation changes prompted by future environmental regulations will require a robust, flexible transmission system to reliably provide electric service to customers. In this report CL&P discusses its efforts to build and maintain a reliable transmission system for delivering renewable energy to its customers and the region.

Chapter 2: FORECAST OF LOADS AND RESOURCES

Chapter Highlights

- Although electric energy usage is expected to increase by 0.4% per year over the 10-year forecast period, peak demand is expected to grow by 0.7% per year during this time.
- While CL&P uses its own Reference Plan Forecast for financial forecasting, the Company 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 October 2011, and are based on CL&P's total franchise area. The base case or 50/50 case is also referred to as the Reference Plan Forecast. The forecast excludes wholesale sales for resale and bulk power sales. CL&P's Reference Plan *Energy* Forecast is based on the results of econometric models, adjusted for CL&P's forecasted C&LM programs shown in Chapter 3 and the projected reductions resulting from distributed generation ("DG") projects developed in accordance with Public Act 05-01, *An Act Concerning Energy Independence* ("PA 05-01").

The Reference Plan *Peak Demand* Forecast is based on an econometric model that uses energy as a trend variable, thus, the reductions for C&LM and DG are implicitly included. The results of the econometric model are adjusted for projected reductions due to ISO-NE's load response program.

The Reference Plan Forecast is used for CL&P's financial planning, but it is not used for transmission planning. As ISO-NE is responsible for regional transmission planning and reliability, it independently develops its own forecast which CL&P 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 CL&P's forecast.

The Reference Plan *Energy* Forecast projects a weather-normalized compound annual growth rate ("CAGR") for total electrical energy output requirements of 0.4% for CL&P from 2011-2021. Without the Company's C&LM programs and DG resources, the forecasted energy growth rate would be 1.3%.

The normalized CAGR for summer peak demand in the Reference Plan *Peak Demand* Forecast is forecasted to be 0.7% over the ten-year forecast period. Similarly, if CL&P's C&LM and DG programs, along with the ISO-NE load response programs, were excluded, the CAGR for forecasted peak demand would be 1.3%.

Table 2-1 provides historic output and summer peaks, actual and normalized for weather, for the 2007-2011 period, and forecast output and peaks for the 2012-2021 period. The sum of the class sales for each year, adjusted for company use and associated losses, is the annual forecast of system electrical energy requirements or output. This is the amount of energy which must be supplied by generating plants to serve the loads on the distribution system.

The Reference Plan Forecast is a 50/50 forecast[1] that assumes normal weather throughout the year, with normal peak-producing weather episodes in each season. The forecasted 24-hour

[1] A "50/50 forecast" is a forecast that is developed such that the probability that actual demand is higher than the forecasted amount is 50%, and the probability that actual demand is lower than the forecasted amount is also 50%.

mean daily temperature for the summer peak day is 82º Fahrenheit ("F") and is based on the average peak day temperatures from 1981-2010. The Reference Plan Forecast's summer peak day is assumed to occur in July, since this is the most common month of occurrence historically. It should be noted, however, that the summer peak has occurred in June, August and September in some years.

2.1.1 Uncertainty in the Reference Plan Forecast

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

- The Economy - The Reference Plan Forecast is based on an economic forecast that was developed in August 2011. 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.
- DG Monetary Grant Program - This forecast includes modest assumptions about sales reductions resulting from DG projects for which monetary grants have been requested on or before October 14, 2008[2]. If customers who have already applied for monetary grants decide not to move forward with their projects, energy usage and peak demand would be different from the forecast.
- Electric Prices - This forecast assumes that total average electric prices will continue to decrease in 2012, then remain fairly stable and that there will be no new price shocks that would cause additional dramatic price-induced conservation similar to what occurred in the 2005 to 2007 period. Also, this forecast makes no adjustments to electric consumption for new pricing structures, such as dynamic peak pricing, which may be on the forecast horizon.
- Electric Vehicles ("EV") – This forecast includes explicit additions to electrical energy output requirements due to electric vehicles. It does not include any additions to the peak forecast since it assumed that the majority of the charging will be done off-peak.
- Weather – The Reference Plan Forecast assumes normal weather based on a thirty-year average (i.e., 1981 – 2010) of heating and cooling degree days. The historical peak day 24-hour mean temperatures range from 74º F to 88º F, with deviations from the average peak day temperatures being random, recurring and unpredictable occurrences. For example, the lowest peak day mean temperature occurred in 2000, while the highest occurred in 2001. 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 and tools 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

[2] On March 18, 2009, the DPUC issued a final decision in Docket No. 05-07-17RE02 which suspended the grant program indefinitely. Projects that had submitted an application prior to October 14, 2008 were still eligible for grants.

load forecast with variability of approximately 10%, or 700 MWs, above and below CL&P's 50/50 forecast, which is based on normal weather. To illustrate, the 2021 summer peak forecast reflecting average peak-producing weather is 5,663 MWs. However, either extremely mild or extremely hot weather could result in a range of potential peak loads from 4,940 MWs to 6,279 MWs. This 1,339 MWs of variation, which is a band of approximately plus or minus 10% around the average, demonstrates the potential impact of weather alone on forecasted summer peak demand.

Extremely hot weather is equally unpredictable, yet the impact is immediate. A hot day in the first year of the forecast that matches the extreme peak day weather in 2001 could produce peak demand almost as high as the forecast for the sixth year under normal weather assumptions. Even a moderately hot day, such as experienced on the 2005 peak day, could increase peak demand by approximately 125 MWs.

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

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 CL&P 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.
>
> A 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, so 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. Page 6.

As CL&P has reported in the past, there is one other major difference between the CL&P and ISO-NE forecasts, aside from the difference between the 50/50 forecast methodology used by CL&P and the 90/10 forecast methodology used by ISO-NE. The CL&P demand forecasts include explicit reductions in the energy forecast for the Company's C&LM programs and DG resources and explicit reductions in the peak demand forecast for ISO-NE's Load Response program, while the ISO-NE demand forecasts do not include these reductions; instead, ISO-NE considers C&LM, Load Response and DG to be supply resources in their capacity forecast.

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

Table 2-1: CL&P 2012 Reference Plan Forecast

	Net Electrical Energy Output Requirements		Reference Plan (50/50 Case)			Extreme Hot Scenario			Extreme Cool Scenario		
Year	Output GWh	Annual Change (%)	Peak MW	Annual Change (%)	Load Factor (2)	Peak MW	Annual Change (%)	Load Factor (2)	Peak MW	Annual Change (%)	Load Factor (2)
HISTORY											
2007	25185		5209		0.552						
2008	24485	-2.8%	5289	1.5%	0.527						
2009	23364	-4.6%	4873	-7.9%	0.547						
2010	23931	2.4%	5345	9.7%	0.511						
2011	23489	-1.8%	5516	3.2%	0.486						
Compound Rates of Growth (2007-2011)											
	-1.7%		1.4%								
HISTORY NORMALIZED FOR WEATHER *											
2007	24936		5209		0.546						
2008	24467	-1.9%	5184	-0.5%	0.537						
2009	23735	-3.0%	4935	-4.8%	0.549						
2010	23484	-1.1%	4994	1.2%	0.537						
2011	23281	-0.9%	5279	5.7%	0.503						
Compound Rates of Growth (2007-2011)											
	-1.7%		0.3%								
FORECAST											
2012	23434	0.7%	5028	-4.8%	0.531	5643	6.9%	0.473	4305	-18.4%	0.620
2013	23583	0.6%	5128	2.0%	0.525	5744	1.8%	0.469	4405	2.3%	0.611
2014	23802	0.9%	5230	2.0%	0.520	5846	1.8%	0.465	4508	2.3%	0.603
2015	23982	0.8%	5321	1.7%	0.515	5936	1.6%	0.461	4598	2.0%	0.595
2016	24203	0.9%	5399	1.5%	0.510	6014	1.3%	0.458	4676	1.7%	0.589
2017	24219	0.1%	5460	1.1%	0.506	6076	1.0%	0.455	4738	1.3%	0.584
2018	24278	0.2%	5517	1.0%	0.502	6133	0.9%	0.452	4795	1.2%	0.578
2019	24321	0.2%	5572	1.0%	0.498	6188	0.9%	0.449	4850	1.1%	0.573
2020	24371	0.2%	5617	0.8%	0.494	6232	0.7%	0.445	4894	0.9%	0.567
2021	24304	-0.3%	5663	0.8%	0.490	6279	0.7%	0.442	4940	0.9%	0.562
Compound Rates of Growth (2011-2021)											
	0.3%		0.3%			1.3%			-1.3%		
Normalized Compound Rates of Growth (2011-2021)											
	0.4%		0.7%			1.7%			-0.8%		

1. Sales plus losses and company use.
2. Load Factor = Output (MWh) / (8760 Hours X Season Peak (MW)).

Forecasted Reference Plan Peaks are based on normal peak day weather (82º mean daily temperature). Forecasted High Peaks are based on the weather that occurred on the 2001 peak day (88º mean daily temperature). Forecasted Low Peaks are based on the weather that occurred on the 2000 peak day (74º mean daily temperature).

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

	Net Electrical Energy Output Requirements					
Year	Unadjusted Output GWH	Distributed Generation GWH	Company Sponsored C&LM GWH	ISO-NE Load Response GWH	Adjusted Output GWH	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER						
2011					23,281	
FORECAST						
2012	24,079	(581)	(64)	-	23,434	0.7%
2013	24,425	(590)	(252)	-	23,583	0.6%
2014	24,831	(597)	(432)	-	23,802	0.9%
2015	25,186	(597)	(607)	-	23,982	0.8%
2016	25,580	(598)	(779)	-	24,203	0.9%
2017	25,764	(597)	(948)	-	24,219	0.1%
2018	25,988	(597)	(1,113)	-	24,278	0.2%
2019	26,194	(597)	(1,275)	-	24,321	0.2%
2020	26,403	(597)	(1,435)	-	24,371	0.2%
2021	26,494	(597)	(1,593)	-	24,304	-0.3%
Normalized Compound Rates of Growth (2011-2021)						
	1.3%				0.4%	

	Reference Plan (50/50 Case)					
Year	Unadjusted Peak MW	Distributed Generation MW	Company Sponsored C&LM MW	ISO-NE Load Response MW	Adjusted Peak MW	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER						
2011					5,279	
FORECAST						
2012	5,185	(50)	(7)	(100)	5,028	-4.8%
2013	5,310	(50)	(32)	(100)	5,128	2.0%
2014	5,437	(51)	(56)	(100)	5,230	2.0%
2015	5,551	(51)	(79)	(100)	5,321	1.7%
2016	5,652	(51)	(102)	(100)	5,399	1.5%
2017	5,737	(51)	(125)	(100)	5,460	1.1%
2018	5,816	(51)	(148)	(100)	5,517	1.0%
2019	5,893	(51)	(170)	(100)	5,572	1.0%
2020	5,960	(51)	(192)	(100)	5,617	0.8%
2021	6,028	(51)	(214)	(100)	5,663	0.8%
Normalized Compound Rates of Growth (2011-2021)						
	1.3%				0.7%	

	Extreme Hot Weather Scenario					
Year	Unadjusted Peak MW	Distributed Generation MW	Company Sponsored C&LM MW	ISO-NE Load Response MW	Adjusted Peak MW	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER						
2011					5,279	
FORECAST						
2012	5,800	(50)	(7)	(100)	5,643	6.9%
2013	5,926	(50)	(32)	(100)	5,744	1.8%
2014	6,053	(51)	(56)	(100)	5,846	1.8%
2015	6,167	(51)	(79)	(100)	5,936	1.6%
2016	6,268	(51)	(102)	(100)	6,014	1.3%
2017	6,352	(51)	(125)	(100)	6,076	1.0%
2018	6,432	(51)	(148)	(100)	6,133	0.9%
2019	6,509	(51)	(170)	(100)	6,188	0.9%
2020	6,576	(51)	(192)	(100)	6,232	0.7%
2021	6,644	(51)	(214)	(100)	6,279	0.7%
Normalized Compound Rates of Growth (2011-2021)						
	2.3%				1.7%	

1. Sales plus losses and company use.
2. Load Factor = Output (MWH) / (8760 Hours X Season Peak (MW)).

2.2 Resources: Existing and Planned Generation Supply

General Connecticut Capacity Picture

Table 2-3 provides a current snapshot of Connecticut's supply-side capacity resources based on fuel type and age, per ISO-NE documents and the Connecticut 2012 IRP. Table 2-3 includes both existing supply side resources and those under contract to be built.

CL&P Specific Capacity Picture

CL&P does not own generation as a result of the restructuring of the electric industry in Connecticut that began in 1998.

Ongoing Generation Purchase Obligations

The Company purchases generation under a number of power-purchase agreements. CL&P also purchases generation from customers who choose to provide supply to the grid through the use of Rate 980. Rate 980 is a CL&P tariff that allows customer-owned generation to be sold to CL&P at prices derived from the ISO-NE wholesale energy market. CL&P does not use any of the foregoing purchases to serve load but rather uses them in the ISO-NE wholesale market to offset contract cost obligations.

Project 150

Over the last eight years, the EDCs have entered into long-term purchase power agreements with Class I renewable energy resource projects, in cooperation with the CCEF and under the direction of the DPUC. Conn. Gen. Stat. §16-244c directed that such agreements should be comprised of not less than a total of 150 MW, and the DPUC program to procure these renewable resources is commonly known as "Project 150". Both CL&P and UI are responsible for compensating Project 150 suppliers through a DPUC-approved Cost Sharing Agreement. CL&P incurs approximately 80% of the costs and receives approximately 80% of the benefits derived from Project 150 energy purchase agreements ("EPAs").

Table 2-4 lists the projects that are currently under long-term contracts in Project 150 and denotes their planned capacity and the estimated date the projects plan to begin operation.

Table 2-3:
Summer Seasonal Claimed Capabilities for Existing and Contracted Connecticut Capacity Sorted by Fuel Supply and Age

	Fuel Supply (first type is primary, second type is alternate)											
	Nuclear	Natural Gas	Natural Gas / Light Oil	Residual Oil	Residual Oil / Natural Gas	Coal / Residual Oil	Coal	Light Oil	Light oil / Natural Gas	Other	Water	Total
Age												
Under contract to be built		45							130	133		308
<= 10 years old		139	1,299					123	375	1		1,937
<= 20 years old		539						12	118	15	2	686
<= 30 years old	1,225		87					14		163	13	1,502
<= 40 yeas old	875			415	448						8	1,746
<= 50 years old				574	236	383		306				1,499
Greater than 50 years old				162	198						111	471
Total	2,100	723	1,386	1,151	882	383	0	455	623	312	134	8,149

Sources / Notes

(1) Existing unit ratings from January 2012 ISO-NE seasonal claimed capability report at: http://www.iso-ne.com/genrtion_resrcs/snl_clmd_cap/2012/scc_january_2012.xls

(2) Under contract to be built unit ratings for Project 150 MWs from this section, rest from 2012 CT Integrated Resource Plan (IRP) prepared by the CT Department of energy and Environmental Protection

(3) Existing unit in-service dates from 2011 ISO-NE CELT report at: http://www.iso-ne.com/trans/celt/report/2011/2011_celt_report.xls

(4) Other fuel includes resources whose primary fuel is wind, tires, biomass, refuse, landfill gas or wood.

(5) Lake Road units 1 through 3, 745 summer MWs are physically but not electrically in Connecticut and so are not part of the table. The 2012 CT IRP indicates that post-NEEWS these resources would likely be considered electrically in Connecticut. These units are just less than ten years old, their primary fuel is natural gas and their alternative fuel is oil.

Table 2-4: Renewable Generation Projects Selected In Project 150

Project (Location)	Project Amount (MW)	Contract Amount (MW)	Est. In-Service Year	Term
Round 2				
DFC-ERG Milford Project (Milford, CT)	9	9	2012	18
Plainfield Renewable Energy	37.5	30	2014	15
Clearview Renewable Energy, LLC	30	30	2012	20
Stamford Hospital Fuel Cell CHP (Stamford, CT	4.8	4.8	2013	15
Clearview East Canaan Energy, LLC (North Canaan, CT)	3	3	2012	20
Waterbury Hospital Fuel Cell CHP (Waterbury, CT)	2.8	2.8	2012	15
Round 3				
Cube Fuel Cell	3.36	3.36	2013	20
DFC-ERG Glastonbury	3.4	3.4	2012	20
DFC-ERG Trumbull	3.4	3.4	2013	20
DFC-ERG Bloomfield	3.65	3.65	2012	20
Bridgeport Fuel Cell Park	14.93	14.93	2012	15

Although the Project 150 generating facilities have contracts with the EDCs, and CL&P is responsible for 80% of their costs and benefits, they are not included in this report's supply tables since CL&P does not anticipate acting as Lead Market Participant for them in the ISO-NE wholesale markets. CL&P believes each project owner has an obligation under this proceeding's enabling statute to report on its project directly to the CSC. CL&P will revisit whether to include these resources in the supply tables in annual filings after they have been placed in-service and reporting responsibilities have been better defined.

Peaking Generation Contracts

PA 07-242 required the state's two publicly owned electric utilities, as well as other interested entities, to submit a proposal to the DPUC to build peaking generation facilities. CL&P is the contractual counter parties to the three selected projects and through a cost sharing agreement with UI is responsible for 80% of the costs. The three selected projects provide a total of 506 MW of peaking generation capacity. CL&P will not receive any of the projects' electricity products nor represent the projects in the ISO-NE markets, and so it is the responsibility of the owners of the winning projects to provide their services to the market. CL&P does not include these projects in its annual filings. As of January 1, 2012 the four GenConn units at Devon are in-service, providing approximately 188 MW of summer rated capacity as are the four GenConn Middletown units (188 MW summer). The PSEG New Haven units (130 MW summer) are expected in-service June 2012.

Capacity Contracts

In the DPUC's Docket No. 05-07-14PH02 *DPUC Investigation of Measures to Reduce Federally Mandated Congestion Charges (Long Term Measures)* the DPUC selected a portfolio of four projects to provide capacity and reduce FMCCs. The winning portfolio constituted a total maximum capacity of 787 MW and consisted of one 620 MW new combined cycle gas-fired baseload plant in Middletown offered by Kleen Energy, a 66 MW peaking plant located in the constrained Southwest Connecticut region (Stamford) offered by Waterside Power, one 96 MW new peaking unit also located in Southwest Connecticut (Waterbury) offered by Waterbury Generation LLC, and one state-wide 5 MW energy efficiency program offered by Ameresco.

UI is the counterparty to both the Waterbury Generation and Ameresco contracts, while CL&P is the counterparty to the Waterside Power and Kleen Energy contracts. CL&P is responsible for 80% of all the costs for all four projects and UI the remaining 20%. These projects are currently in-service.

2.2.1 Capacity Forecast

The capacity tables in this chapter provide estimates of CL&P's supply resources for which it has ownership or purchase entitlement interests at present and will maintain such interests during the 2012-2021 forecast period. All resources have winter and summer ratings in MWs as reported in ISO-NE's January 2012 seasonal claimed capability report, reflecting the effects of varying seasonal conditions, such as ambient air and water temperatures, on unit ratings. In 2010, the seasonal claimed capability ratings methodology was reformed for resources designated as intermittent power resources ("IPR")to use the same method as used to establish these resources' qualified capacity in the ISO-NE's Forward Capacity Market ("FCM"). The ratings in the tables reflect this reformation for those resources designated as IPR. As noted in prior forecasts, as of June 2010 capacity obligations will be measured and met using principally only summer-rated capacity. Winter-rated capacity can be compensated in the FCM in two ways: 1) resources with winter ratings greater than their summer ratings may partner with resources having summer ratings greater than their winter ratings to meet capacity obligations; or 2) IPRs are paid for their winter rated capacity. Resources contractually obligated to sell all their output to utilities under PURPA are considered IPRs. In order to provide the CSC with a complete picture of Connecticut's generation capacity, winter ratings will continue to be provided in this annual report.

2.2.2 Existing Resources and Planned Generation Resource Additions, Deactivations or Retirements

Table 2-5 lists existing supply resources in which CL&P has ownership or entitlement interests for winter 2011/2012 and summer 2012. This table lists CL&P's supply resources based on ownership or entitlement, arranged by: Base Load, Intermediate, Peaking, Pumped Storage, Hydroelectric, and Purchases categories.

Table 2-5:
Generation Facilities in Which CL&P Has Ownership or Entitlement by Category

	WINTER RATING (MW)	SUMMER RATING (MW)	YEAR INSTALLED	LOCATION	% ENTITLEMENT CL&P
	2011/12	2012			
Base					
Vermont Yankee	49.59	0.00	1972	Vernon, VT	7.897
Nuclear Subtotal	49.59	0.00			
Intermediate	0.00	0.00			
Peaking	0.00	0.00			
Pumped Storage	0.00	0.00			
Hydro	0.00	0.00			
Purchases					
System	0.00	0.00			
Non-Utility	106.09	56.20			
Purchase Total	106.09	56.20			
Total Generation	155.68	56.20			

Base-load units are typically operated around the clock, intermediate units are those used to supply additional load required over a substantial part of the day, and peaking units supply power usually during the hours of highest demand. On occasion, some of the more efficient intermediate units operate as base-load units, while others may be called upon to operate as peaking capacity. Accordingly, these categories are intended to be generally descriptive rather than definitive, and reflect past operating patterns.

2.2.3 Ten-Year Capacity Forecast

Tables 2-6 and 2-7 summarize the ten-year capacity forecast for supply resources in which CL&P will have ownership or entitlement interest during the summer and winter peak periods from 2012 through 2021. The tables show CL&P's reserve margin expressed in MWs. Reserve margins decline over time, reflecting the ends of purchase power agreements. CL&P does not know with certainty that these resources will continue to operate as merchant generators once their contracts with CL&P end. However, with respect to these resources, the 2012 IRP assumes they will continue to operate.

Table 2-6:
2012 – 2021 Summer Forecast of Capacity (WM) at the Time of Summer Peak

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SUPPLY BEFORE SALES OR EXCHANGES	56.20	56.20	56.20	44.31	41.31	23.95	23.95	15.12	15.12	0.55
CAPACITY SALES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET GENERATION AVAILABLE	56.20	56.20	56.20	44.31	41.31	23.95	23.95	15.12	15.12	0.55
RESERVE	56.20	56.20	56.20	44.31	41.31	23.95	23.95	15.12	15.12	0.55

Table 2-7:
2011/2012 – 2020/2021 Summer Forecast of Capacity (WM) at the Time of Winter Peak

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
SUPPLY BEFORE SALES OR EXCHANGES	155.68	57.25	57.25	44.56	44.56	41.56	23.96	22.26	15.21	14.37
CAPACITY SALES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET GENERATION AVAILABLE	155.68	57.25	57.25	44.56	44.56	41.56	23.96	22.26	15.21	14.37
RESERVE	155.68	57.25	57.25	44.56	44.56	41.56	23.96	22.26	15.21	14.37

Resource Purchases

Table 2-8 provides a listing of existing cogeneration and small power production facilities 1 MW and greater located in Connecticut from which CL&P purchased power in 20011. The winter and summer claimed capacity of the generation at each production facility as of January 2012 is shown in this table. As a result of reforming the methodology used to rate IPR some units have had their claimed capabilities fall below 1MW. They are still shown because their contract capacities continue to be greater than 1 MW and were reported in the past.

Table 2-8:
Existing Owned Customer Facilities 1 MW and Above
Providing Generation to the Northeast Utilities System

EXISTING & PROVIDED GENERATION TO CL&P DURING 2011

Project Name	Location	(1) Facility Type	Fuel Source	By-Product of Fuel Consumption	Estimated Capacity kW	Max Claimed Capability Winter	Max Claimed Capability Summer
FACILITIES UNDER LONG TERM CONTRACT (2)							
AES Thames	Montville, CT	COGEN	Coal	Steam	181,000	0	0
Derby Dam	Shelton, CT	SPP	Hydro	-	6,900	7,050	7,050
Goodwin Dam	Hartland, CT	SPP	Hydro	-	3,294	3,000	3,000
Colebrook	Colebrook, CT	SPP	Hydro	-	3,000	432	860
Quinebaug	Danielson, CT	SPP	Hydro	-	2,161	839	873
Kinneytown B	Seymour, CT	SPP	Hydro	-	1,500	513	330
Mid-CT CRRA(So. Meadow 5/6)	Hartford, CT	SPP	Refuse	-	67,000	48,843	49,419
Preston (SCRRRA)	Preston, CT	SPP	Refuse	-	13,850	16,651	16,169
Bristol RRF	Bristol, CT	SPP	Refuse	-	13,200	12,693	11,892
Lisbon	Lisbon, CT	SPP	Refuse	-	13,500	13,649	13,700
Hartford Landfill	Hartford, CT	SPP	Methane	-	2,445	1,705	1,777
					307,850	**105,375**	**105,070**
FACILITIES NOT UNDER LONG TERM CONTRACT (3)							
Pratt & Whitney	E. Hartford, CT	COGEN	Gas	Steam	23,800	N/A	N/A
Rainbow (Farmington River Power)	Windsor, CT	SPP	Hydro	-	8,200	N/A	N/A
Ten Co./The Energy Network	Hartford,CT	COGEN	Gas	Steam	4,500	N/A	N/A
WM Renewable	New Milford,CT	SPP	Methane	-	1,675	N/A	N/A
					38,175	**0**	**0**
				TOTAL EXISTING	**346,025**	**105,375**	**105,070**

(1) "SPP" Denotes a Small Power Producer, "COGEN" Denotes a Cogenerator.
(2) Estimated Capacity Represents Contracted Capacity.
(3) Estimated Capacity Represents Estimated Installed Capacity.

2.3 Generation Capacity Considerations

Although CL&P no longer owns or operates generation, it continues to have a responsibility to ensure the reliability of the electric system to deliver power to customers. Two important developments since the advent of the deregulated electric industry in Connecticut, the IRP and the ISO-NE FCM, play roles in planning for supply resources in the state.

Integrated Resource Plan for Connecticut

The 2012 IRP concluded that Connecticut will not need to add new capacity to supply capacity needs under a wide range of futures for the next ten years. This conclusion was based on a set of assumptions, including: retirements; the continued funding of C&LM initiatives at current levels; new resources contracted by the Connecticut come on-line as planned, including 506 MWs of peaking generation (see Section 2.2); and the completion of the NEEWS transmission projects. The 2012 IRP developed a Base Case, predicated on a number of assumptions that found that 3,326 MW of capacity may retire in New England by 2022, 1,121 MW in Connecticut. The foregoing retirements were based on a retirement study done as part of the 2012 IRP effort that compared future wholesale market revenues including net energy and capacity revenues to going-forward costs including costs to comply with possible future emission requirements developed by the CT DEEP in consultation with other New England state environmental regulators and Connecticut generation owners

ISO-NE Forward Capacity Market

ISO-NE conducted its fifth Forward Capacity Auction (“FCA”) in June 2011in which 39,360 MW of qualified capacity competed to provide 33,200 MWs needed for reliability between June 2014 and May 2015. The FCA consisted of seven rounds, starting at a price of $10.698/kW-mo. Bidding in the final round reached the minimum price established for this auction at $3.209/kW-mo, with 3,718MW of excess internal New England generation resources remaining. Note that the excess generation does not include 122 MW of real-time emergency generation that cleared surplus to the 600 MW allotment for real-time emergency generation under the capacity market rules.

Chapter 3: CONSERVATION AND LOAD MANAGEMENT (C&LM)

Chapter Highlights

- Energy and Demand savings resulting from Connecticut Energy Efficiency Fund programs are a cost-effective resource available to Connecticut customers.
- Connecticut Energy Efficiency Fund programs maximize the amount of energy-efficiency monies available to customers by leveraging a variety of funding sources.
- Connecticut Energy Efficiency Fund programs are recognized nationally and provide Economic development benefits to the State.
- The CL&P 2012 Conservation and Load Management Plan includes an increased savings scenario, which is consistent with Public Act 11-80 policy objectives of increasing the role of energy efficiency in Connecticut.

CL&P 2012 Conservation Plan

On September 30, 2011, the 2012 Conservation & Load Management Plan (2012 C&LM Plan) was filed with the Connecticut Department of Energy and Environmental Protection (DEEP). The 2012 C&LM Plan was a joint electric and natural gas program plan filed by the state's electric distribution companies, CL&P and The United Illuminating Company ("UI"), and natural gas distribution companies, Connecticut Natural Gas Corporation, Southern Connecticut Gas Company, and Yankee Gas Services Company, in Docket 11-10-03, *PURA Review of the Connecticut Energy Efficiency Fund's Conservation and Load Management Plan for 2012.* The 2012 C&LM Plan is based upon input from members of the public, industry groups and private enterprise, and was given final approval from the Energy Efficiency Board ("EEB") in September, 2011. A base budget and an increased savings scenario budget were presented in the 2012 C&LM Plan. In the 2012 C&LM Plan, CL&P proposed a base plan budget of $84.2 million and an increased savings scenario budget of $171.4 million.

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.[3] This funding source is known as the Connecticut Energy Efficiency Fund, which is administered by the state's electric and natural gas utility companies. In 2012, C&LM programs will receive additional funding from sources including the Independent System Operator of New England (ISO-NE)'s Forward Capacity Market, Class III renewable energy revenues, and Regional Greenhouse Gas Initiative (RGGI). In 2012, Demand Response will be fully funded by the ISO-NE Forward Capacity Market.

Energy efficiency is the most cost-effective resource available to policymakers to address rising energy costs, reliability challenges, and greenhouse gas reduction. Efficiency and load response programs reduce the amount of energy Connecticut's 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: residential, commercial, industrial and municipal.

[3] Conn. Gen. Stat. § 16-245m.

Energy efficiency programs also provide economic development benefits for Connecticut. A 2009 independent study[4] analyzed the size of Connecticut's green jobs marketplace and showed that 2,675 jobs are directly attributed to energy efficiency. These jobs create $137 million of employment income, at an average salary of approximately $50,000 per year across all industry segments (residential, small business, commercial and industrial). An even greater number of indirect jobs has been created from the energy savings the programs deliver, as consumers and businesses spend and invest the money, which would otherwise have spent on energy, in other areas. Another 4,280 indirect and induced jobs can be attributed to energy efficiency activity in Connecticut.

Connecticut is a nationally recognized leader in implementing high-quality energy-efficiency programs. Since 2000, the American Council for an Energy Efficient Economy (ACEEE) has ranked Connecticut as one of the top states for energy efficiency. In the ACEEE's *2011 State Energy Efficiency Scorecard*, Connecticut ranked tied for eighth in the nation. This ranking reflects the success of Connecticut's energy efficiency programs.[5] However, a stated goal of the Malloy administration is to make Connecticut the leading state in energy efficiency. In response to this goal, CL&P included the increased savings scenario in the 2012 CL&M Plan. The increased funding scenario is based on an annual energy conservation savings goal of two percent of retail sales.

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

Connecticut Integrated Resource Plan

In 2007, Public Act 07-242, *An Act Concerning Electricity and Energy Efficiency*, mandated the creation of an Integrated Resource Plan (IRP) and that "resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible." The Act positioned energy efficiency as a key component of the state's comprehensive energy resource plan and creates the potential for more funding for energy efficiency programs in the future. In response to Public Act 07-242, CL&P and UI submitted an Integrated Resource Plan to the Connecticut Energy Advisory Board (CEAB) in 2008, 2009 and 2010.

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 future Integrated Resource Plans. As a result, a fourth Integrated Resource Plan has been developed by DEEP with the Draft completed on January 17, 2012. The IRP recommends higher levels of energy efficiency spending consistent with the increased savings scenario in the 2012 C&LM Plan. The IRP estimates that the expanded energy efficiency programs and associated customer savings would support an additional 5,500 jobs by 2022.

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[4] Navigant Consulting, CT Renewable Energy/Energy Efficiency Economy Baseline Study. Phase I Deliverable, March 27, 2009.

[5] Utility and Public Benefits Programs and Policies represent the largest share (40%) of the ACEEE ranking. Other categories in the ACEEE ranking were Transportation (18%), Building Energy Codes (14%), Combined Heat and Power (10%), State Government Initiatives (14%), and Appliance Efficiency Standards (4%).

3.1 Ten-Year C&LM Forecast

Table 3-1A presents the potential cumulative annual energy savings and summer and winter peak-load reductions forecasted for C&LM programs implemented in the CL&P service territory for the 2012 C&LM Plan base budget. Table 3-1B presents the potential cumulative annual energy savings and summer and winter peak-load reductions forecasted for CL&M programs implemented in the C&LP service territory for the 2012 C&LM increased savings scenario. Forecast years starting in 2013 are based on similar programs and budgets as the 2012. The projected impacts of C&LM programs have been shown as separate line items since the average impact of energy-efficiency programs is greater than ten years, while load-response activities have a more immediate, short-term impact.

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.

The most significant variable in determining energy savings is the stability of funding. Projections are based on the continued implementation of a suite of programs similar in nature and focus to the 2012 C&LM Plan[6] and expected future funding as described above. Any additional legislative or regulatory changes in geographic and program focus will produce results that may vary from these projections. In particular, adoption of the Integrated Resource Plan and the Increased Savings scenario described above will have an impact on this forecast.

[6]A variety of funding sources are leveraged in order to support this level of C&LM activity. Since the passage of the State's restructuring legislation in 1999 (Public Act 98-28), a 3 mil electric charge has been the primary funding source for C&LM programs. The 3 mil charge will account for approximately $67.4 million of the C&LM budget in 2012. In addition to the 3 mil charge, demand savings from the C&LM Programs are entered into the Forward Capacity Market (FCM). CL&P expects approximately $10.0 million in revenues from the FCM (includes passive and active resources). Energy savings from C&LM activity also generates Class III renewable energy revenues that will support C&LM activity at a level of approximately $3.6 million in 2012. In addition to those sources of C&LM funding, CL&P estimates an additional $2.4 million annually of C&LM revenue from the Regional Greenhouse Gas Initiative (RGGI) as well as $0.8 in carrying charges in 2012.

Table 3-1A: CL&P C&LM Programs Impacts Base Budget Connecticut Light and Power 2012 – 2021 GWh Sales Saved										
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	27	106	179	248	313	375	433	489	543	595
Commercial	30	118	205	291	377	464	550	636	722	808
Industrial	7	28	48	68	88	109	129	149	169	190
Total GWh Sales Conserved	64	252	432	607	779	947	1,112	1,274	1,434	1,592
MW Reductions (Passive Resource Summer Impacts)										
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	2	9	16	22	28	34	39	45	50	55
Commercial	4	18	32	46	60	74	88	101	115	129
Industrial	1	4	8	11	14	17	21	24	27	30
Total	**7**	**32**	**56**	**79**	**102**	**125**	**148**	**170**	**192**	**214**
MW Reductions (Passive Resource Winter Impacts)										
	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	6	28	47	66	84	102	118	135	150	165
Commercial	3	12	21	31	40	49	58	67	76	86
Industrial	1	3	5	7	9	11	14	16	18	20
Total	**10**	**43**	**74**	**104**	**133**	**162**	**190**	**218**	**245**	**271**

Note: This table includes only passive resources. It does not include 100 MW of Load Response demand savings (active resources) which CL&P maintains through the ISO-NE program.

Table 3-1B: CL&P C&LM Program Impacts
Increased Savings Scenario

Connecticut Light and Power 2012 – 2021 GWh Sales Saved

	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	55	240	425	609	794	978	1,163	1,348	1,532	1,717
Commercial	72	310	549	787	1,026	1,265	1,503	1,742	1,980	2,219
Industrial	17	73	129	185	241	297	353	409	465	520
Total GWh Sales Conserved	**144**	**623**	**1,102**	**1,581**	**2,060**	**2,540**	**3,019**	**3,498**	**3,977**	**4,456**

MW Reductions (Passive Resource Summer Impacts)

	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	5	21	37	53	69	85	101	117	133	149
Commercial	11	47	83	119	155	191	227	263	299	335
Industrial	3	11	19	28	36	45	53	62	70	79
Total	**18**	**79**	**139**	**200**	**260**	**321**	**381**	**442**	**502**	**563**

MW Reductions (Passive Resource Winter Impacts)

	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Residential	13	55	97	140	182	224	267	309	351	394
Commercial	7	30	53	76	99	121	144	167	190	213
Industrial	2	7	12	18	23	28	34	39	45	50
Total	**21**	**92**	**162**	**233**	**304**	**374**	**445**	**515**	**586**	**657**

Note: This table includes only passive resources. It does not include 110 MW of Load Response demand savings (active resources) which CL&P maintains through the ISO-NE program.

Chapter 4: TRANSMISSION PLANNING AND SYSTEM NEEDS

Chapter Highlights

- CL&P's transmission facilities are part of the New England regional grid and must be designed, operated and maintained to ensure compliance with mandatory NERC reliability standards.
- CL&P is proposing new 345-kV and 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.
- The Connecticut 2012 Integrated Resource Plan recognizes that a robust transmission system benefits both generation and load with increased interconnection and deliverability enhancements.
- FERC Order 1000 on "Transmission Planning and Cost Allocation" was issued on July 21, 2011. The order provides for consideration of transmission needs driven by public policy requirements in the local and regional planning process and also includes mandates that require utilities and RTOs to prepare and submit compliance filings. The State, along with other stakeholders, is helping ISO-NE to develop this compliance filing.

4.1 Transmission is planned and built for the long term

Transmission systems enable varying amounts and sources of generation to serve varying 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 as many scenarios as possible.

4.2 Transmission Planning and National Reliability Standards

The Federal Energy Policy Act of 2005 required FERC to designate an entity to provide for a system of mandatory, enforceable reliability standards under FERC's oversight. This action is part of a transition from a voluntary to a mandatory system of reliability standards for the bulk-power system. In July 2006, FERC designated the North American Electric Reliability Corporation ("NERC") as the nation's Electric Reliability Organization ("ERO"). The ERO is to improve the reliability of the bulk-power system by proactively preventing situations that can lead to blackouts, such as that which occurred in August 2003.

The Connecticut transmission system is part of the larger NERC Eastern Interconnection and thus subject to the interdependencies of generation, load and transmission in neighboring electric systems. NERC recognizes that the actual planning and construction of new transmission facilities have become more complex. In 1997, NERC stated the following:

> *The new competitive electricity environment is fostering an increased demand for transmission service. With this focus on transmission and its ability to support competitive electric power transfers, all users of the interconnected transmission*

systems must understand the electrical limitations of the transmission systems and the capability of these systems to reliably support a wide variety of transfers.

The future challenge will be to plan and operate transmission systems that provide the requested electric power transfers while maintaining overall system reliability. All electric utilities, transmission providers, electricity suppliers, purchasers, marketers, brokers, and society at large benefit from having reliable interconnected bulk electric systems. To ensure that these benefits continue, all industry participants must recognize the importance of planning these systems in a manner that promotes reliability.[7]

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

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

4.3 Environmental Regulations and Public Policy

A number of existing and proposed EPA rules and regulations will affect generation retirement decisions. While prices in the capacity markets will also drive these retirement decisions, EPA rules and regulations (e.g. regarding hazardous air pollutants such as mercury, tighter ozone standards and the Clean Water Act on cooling water intakes) that require generators to install costly retrofits will also be a major factor in retirement decisions in the longer term. For now, however, these regulations appear to have flexible retrofit requirements or lead times in order to minimize impacts on supply reliability.

With regards to public policy, Connecticut has the highest target under the renewable portfolio standard (RPS), 20% by 2020 of all New England states, but few native resources. CT meets its RPS targets primarily by purchasing renewable energy credits generated elsewhere in New England; therefore Connecticut competes with other states in the renewable energy credit market. The IRP 2012 found that Connecticut will fall short of its RPS target as early as 2018 unless the development of renewable resources and associated enabling transmission across New England is accelerated.

4.4 CT Integrated Resource Plan – IRP 2012

Connecticut passed Public Act 11-80, an Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future

[7] Planning Standards, North American Electric Reliability Council, September 1997

Efficiency, in 2011. The bill merged the Department of Environmental Protection and Department of Public Utility Control into a new state department - Department of Energy and Environmental Protection ("DEEP"). The bill was also designed to move the state closer to an efficient, affordable and clean energy future.

DEEP issued the state's 2012 final draft report of the IRP in January 2012. This report is the fourth IRP report for Connecticut and marks the first IRP report developed by DEEP. The report reviewed the state's 10-year electricity outlook and developed a comprehensive vision for improving the state's energy future. The report also recommends policies that will help make electricity cheaper, cleaner and more reliable, while supporting in-state employment.

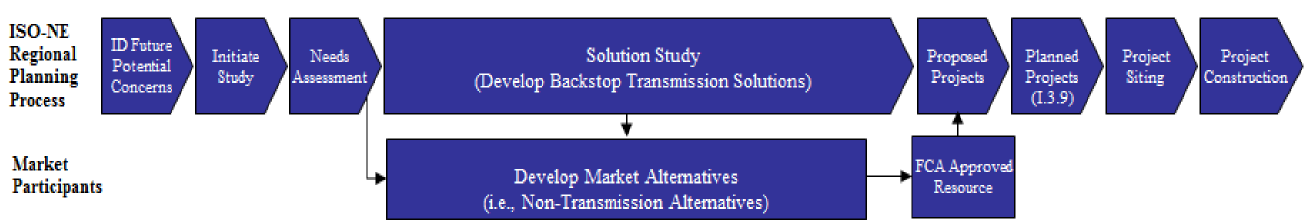
4.4.1 Transmission Planning Process

Within the ISO-NE regional planning process that supports compliance with NERC and NPCC planning standards, ISO-NE and transmission owners (TOs) perform 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 TOs 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, environmental impacts, 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 market resource alternatives (non-transmission alternatives NTAs) that would resolve the identified needs.

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

Transmission Planning Process Figure



Two transmission reliability sub-area studies are currently in progress for Connecticut. These studies, performed by TO's in collaboration with ISO-NE, are at various stages in the ISO-NE Regional Planning Process.

1. Southwest Connecticut (SWCT) Solution Study.

2. Greater Hartford/Central Connecticut (GHCC) Needs Assessment. This study includes a needs assessment of the Greater Hartford area (including Northwest Connecticut,

Manchester, and Middletown areas) and a reassessment of the Central Connecticut Reliability Project (CCRP) portion of the New England East-West Solution (NEEWS).

4.4.2 Non-Transmission Alternatives to Resolve System Reliability Problems

In the IRP 2012 report the state of CT reiterated its position to build upon previous IRP decisions to remain active in the creation of a region-wide NTA process. Several states, including Connecticut, approached ISO-NE about the timing of NTA analysis and the need to better align markets and planning. The alignment of NTA processes with ISO-NE regional processes is important and has been recognized in prior Connecticut IRPs. Therefore, the IRP 2012 report did not propose a Connecticut-specific NTA process rather; Connecticut plans to support the development of the recently announced conceptual ISO-NE NTA process. This process is part of ISO-NE's Strategic Planning Initiative.

4.4.3 IRP 2012 Findings and Results

Transmission projects proposed for Southern New England (i.e. NEEWS) are an integral part of the CT IRP results upon which the report built its findings and recommendations. In addition to NEEWS being planned for transmission reliability purposes, the IRP 2012 concluded that NEEWS will also support locational resource adequacy in Connecticut by increasing the Connecticut import capability.

Furthermore, the NEEWS projects also allow an orderly implementation of public policy and market rules by:

1. Allowing implementation of environmental regulation that could cause early retirements of some CT resources or re-powering of some Connecticut generation resources.

2. Facilitating potential out-of-state regional renewable energy (Northern wind and possibly other renewables) to meet RPS requirements.

3. Providing an opportunity to deliver reduced electricity prices to CT consumers through the mitigation of possible energy and capacity price separation from the rest of New England.

ISO-NE's current development of a process to better align Markets and Planning is a new opportunity for the State of CT to participate in shaping the Regional Planning Process.

4.5 Background on CL&P's Transmission System

Transmission lines operate at 69-kV and above and collectively form the infrastructure that is the interstate electric "highway system." The transmission line system is capable of moving large amounts of electric power from where it is produced to where it is used. In New England, moving large amounts of electric power over longer distances is achieved primarily by the interconnected 345-kV regional bulk power system. The 345-kV transmission network and ties to neighboring utilities and control area are key for reliably meeting customer peak demands for electricity. CL&P's transmission network also includes lower capacity transmission ties to neighboring utilities, operating at voltages between 69 kV to 138 kV. These tie lines connect with WMECO in Massachusetts, National Grid in Rhode Island, Central Hudson in New York, Long Island Power Authority in New York, Connecticut Municipal Electric Energy Cooperative, Inc. ("CMEEC"), and UI.

Interstate tie lines make CL&P's transmission system part of the interconnected New England transmission network. Transmission lines across New England and outside of the region are interconnected to form a transmission network, sometimes called a "grid" or "system". A transmission grid serves multiple purposes, all of which work together to enhance delivery reliability. CL&P and other utilities design the transmission grid to withstand national, regional and company-specified contingencies, so that electric power can be transmitted reliably and safely throughout the interconnected grid. CL&P's portion of the New England transmission grid is used to support reliable, economical and continuous service to intra-state customers. The interstate grid enables CL&P to efficiently transmit power throughout its franchise service territory and to share in the reliability benefits of parallel transmission paths.

CL&P's 345-kV transmission system specifically enables the efficient movement of power from large central generating stations, such as Middletown 4, Kleen Energy, Lake Road and the Millstone Nuclear Power Station to the east and the Milford Power, Bridgeport Energy and other large units in Southwest and throughout Connecticut and over three interstate transmission tie lines to and from neighboring utilities.

The CL&P transmission system, with its tie lines to neighboring utilities, provides multiple paths for electric energy to move freely over the southern New England transmission grid following transmission and generation emergencies. CL&P especially relies on the bulk power 345-kV transmission grid to reliably transmit electric power to high load density areas in Connecticut and CL&P plans to maintain a robust and reliable 345-kV transmission network to meet those demands. CL&P's long-term mission is to ultimately operate 345-kV loops to its neighboring electric systems in New England and New York to ensure reliability of its transmission system in the best interests of CL&P's customers.

In the recent past, Connecticut's most pressing transmission system need was to increase the capability of the system to transport power in southwestern Connecticut ("SWCT"), where nearly half of the state's load is located. CL&P addressed these needs with the construction of the Bethel-Norwalk Project, Glenbrook Cables Project, the Long Island Cable Replacement Project and the Middletown Norwalk Project.

Existing Substations and System Loops

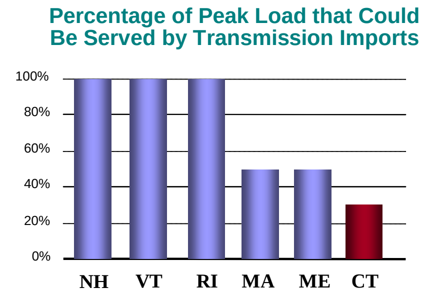
CL&P currently has twelve major bulk-power substations where the 345-kV and 115-kV transmission networks interconnect - Montville, Card, Manchester, Barbour Hill, Southington, Frost Bridge, North Bloomfield, East Devon, Norwalk, Killingly, Haddam, and Plumtree. These twelve substations enable bulk power from large central generation stations to join with power imported over the three 345-kV transmission tie lines for delivery to CL&P's 115-kV system.

The 115-kV transmission system draws power from these bulk-power substation sources and transmits this power, together with power from smaller central generating stations connected to the 115-kV system and from 115-kV transmission tie lines, to distribution step-down substations which then supply local area load over power distribution lines. The 115-kV transmission system loops around high load-density pockets, primarily in central and SWCT, and connects power sources with load centers in the eastern and northwestern areas of the state.

Connecticut's Transmission System and Serving Load

CL&P plans, builds and operates transmission infrastructure with a long-term vision to safely and reliably deliver power to its customers, under a wide variety of supply and demand conditions.

- CL&P is responsible to meet mandatory reliability standards mandated by the FERC and implemented by NERC and faces severe financial penalties of up to $1 million per day for *each* non-compliance occurrence.
- Among all the New England states, Connecticut is the least able to serve its peak load using power imports.
- Connecticut imports are currently limited by its transmission system to a range of 300 MW to 2,500 MW – or up to about 30% of the state's peak load.
- Consequently, at least 70% of the electricity needed to serve customer peak demand must be generated in Connecticut.



Note: Chart uses approximate values based on known interface limits.

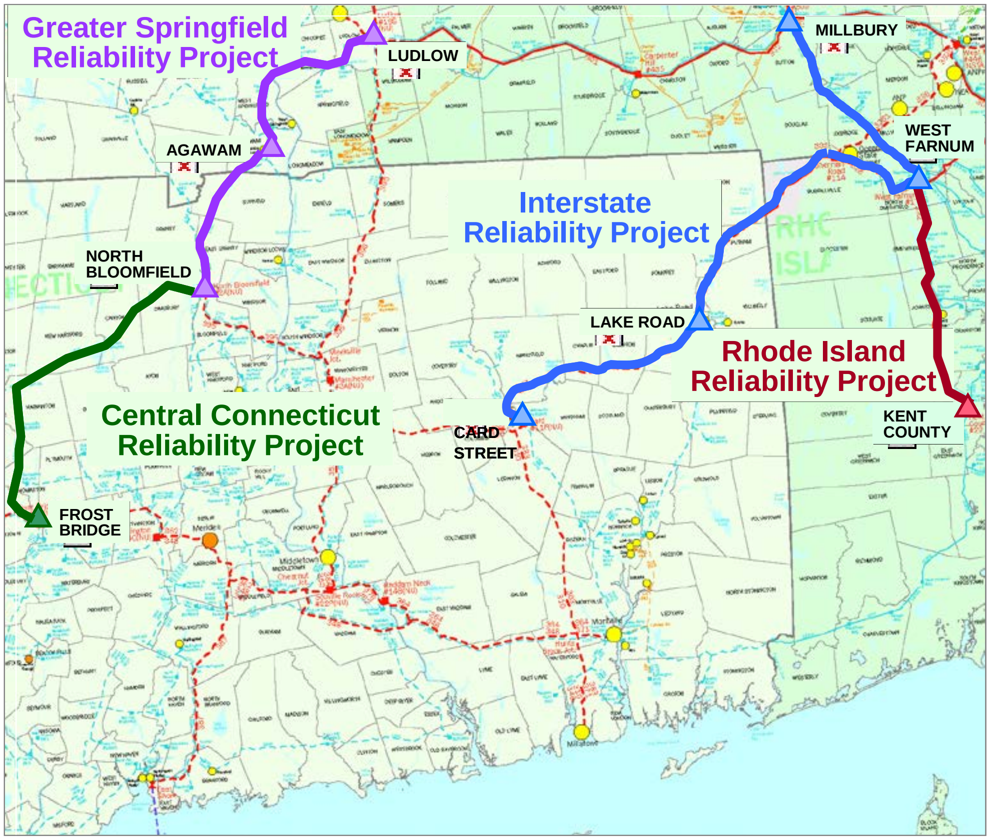
- The potential to develop large quantities of renewable resources, like solar, wind and hydroelectric power, is very low in Connecticut, but wind and hydroelectric power have greater development prospects in northern New England and Canada.
- The prospect of transporting renewable energy from northern New England and Canada to southern New England is particularly promising. Northeast Utilities, the parent company of CL&P, is currently developing a transmission project with NSTAR and Hydro-Quebec that would enable imports of up to 1,200 MW of low-carbon power generated in Canada.

4.6 The New England East – West Solution (NEEWS)

Connecticut's electric system reliability is explicitly tied to the state's ability to import electric power over the New England transmission grid. During the summer of 2006, Connecticut (including CL&P, UI and CMEEC) experienced an all-time peak demand of approximately 7,400 MW. The second highest peak demand occurred in the summer of 2011. It is becoming increasingly likely that the potential retirement of aging and uneconomic Connecticut generation will result in a condition where in-service generation and transmission imports together cannot reliably meet the growing summer peak customer demands for electric power. Under ideal system conditions Connecticut can reliably import only about 30% of the state's peak power demand, and much less if external system conditions limit transfers (such as outages of certain generators in the greater Springfield, Massachusetts area).

ISO-NE, in its 2005 Regional System Plan, first identified the need for major southern New England transmission system reinforcements to address multiple reliability problems between Connecticut, Massachusetts and Rhode Island. ISO-NE, CL&P and National Grid have since collaborated and developed a comprehensive set of interrelated transmission reinforcement projects known as NEEWS. Figure 4-1 is a graphical depiction of the new 345-kV transmission projects associated with NEEWS.

Figure 4-1: Map of NEEWS Projects



A brief description of the projects is listed below.

Greater Springfield Reliability Project – ("GSRP") and Manchester to Meekville Junction Project – (MMP)

A new 345-kV transmission tie-line connecting north-central Connecticut and western Massachusetts, will address reliability problems in the greater Springfield and north-central Connecticut areas. The new 345-kV line will connect CL&P's North Bloomfield Substation in Bloomfield to a new WMECO 345/115-kV substation being planned as an expansion of the Agawam Substation. GSRP includes the construction of a new 345-kV transmission line between WMECO's existing Ludlow 345/115-kV Substation and the new Agawam 345/115-kV Substation, as well as rebuilds and some changed circuit configurations for all existing 115-kV lines between these two substations.

The transmission solution in central Connecticut includes the Manchester to Meekville Junction Project ("MMP"). A variation of the proposed MMP was approved by the Connecticut Siting Council in 2010 that provides an additional 345-kV line segment from Manchester to Meekville Junction. This project is not shown in Figure 4-1 above. ISO-NE approved the GSRP and MMP projects in September of 2008. The GSRP and MMP projects are currently under construction.

Interstate Reliability Project

New 345-kV transmission lines connecting eastern Connecticut with Rhode Island and central Massachusetts will address reliability problems in southern New England. The project will connect CL&P's Card 345/115-kV Substation in Lebanon, Connecticut to National Grid's West Farnum Substation in Rhode Island. Along the way this project will also include new 345-kV line connections to the Lake Road Switching Station. National Grid will own the portion of new 345-kV line from the Connecticut/Rhode Island border to West Farnum Substation. The other main National Grid component of the Interstate Reliability Project is a new 345-kV transmission tie-line between its West Farnum Substation in Rhode Island and its Millbury Switching Station in central Massachusetts. This project will also increase the transmission system's ability to reliably deliver electric power across southern New England, and it will increase the ability to import electric power into the state. The need for the Interstate Reliability Project was confirmed by ISO-NE at the August, 2010 Planning Advisory Committee (PAC) meeting. Thereafter, CL&P and National Grid updated the projected in-service date for the Interstate Reliability Project to 2015. On December 23, 2011 CL&P applied to the CSC for a Certificate of Environmental Compatibility and Public Need for the construction of the Connecticut portion of the Interstate Reliability Project.

Rhode Island Reliability Project – ("RIRP")

New and modified 115-kV and new 345-kV transmission facilities will address reliability problems associated with Rhode Island's limited access to the 345-kV system and its over-dependence on local generation. These facilities are currently being constructed by National Grid.

Central Connecticut Reliability Project – ("CCRP")

A new 345-kV transmission line connecting CL&P's North Bloomfield 345/115-kV Substation in Bloomfield with the Frost Bridge 345/115-kV Substation in Watertown will address reliability problems across central Connecticut. The project will increase the delivery of electric power from eastern Connecticut to western and southwestern Connecticut. The needs reassessment of the Central Connecticut Reliability Project components of NEEWS (the fourth and last component) has been combined with the Hartford, Barbour Hill and Middletown studies to become the Greater-Hartford-Central Connecticut study.

In conclusion, NEEWS is a comprehensive plan for Connecticut and southern New England that addresses many future conditions by improving the transmission system in the following manner:

- Strengthens the bulk-power delivery systems between Connecticut, Massachusetts and Rhode Island with the addition of new high capacity 345-kV transmission circuits;

- Increases the New England east-west and regional west-east power transfer capability across southern New England;

- Provides an alternate 345-kV electric power source to the North Bloomfield Substation and establishes a new 345/115-kV "hub" west of the Connecticut River in Agawam where many existing 115-kV transmission circuits connect;

- Establishes additional 345-kV circuit connections at the Lake Road Switching Station in Killingly which will enhance the power delivery capability of the transmission network in the vicinity of the Lake Road Generating Station; and

- Establishes a new 345-kV transmission path between the North Bloomfield and Frost Bridge Substations which will increase the Connecticut transmission system's capability to move electric power across the state from east to west.

Following the completion of the NEEWS projects, Connecticut's import capability will increase to approximately 3,600 MW or approximately 45% of the state's peak load. Increasing the state's ability to import electric power from outside Connecticut will benefit customers in three ways.

- First, it will strengthen system reliability by broadening the base of power supply available to meet Connecticut customer demands via an improved interconnection of the Lake Road Generating Station and higher power import capability.

- Second, it will have a favorable impact on electric energy costs, because the same broadened base of supply should reduce the instances of reliability agreements and other congestion charges that are related to transmission system limitations.

- Third, it will help provide access to remote renewable and/or lower emission generation, helping Connecticut to meet state and federal environmental goals.

4.7 Assessment of Transmission Needs in Connecticut's Sub-areas

CL&P's service territory is sub-divided into six areas for the purpose of assessing the reliability of the CL&P transmission system. A description and a summary of the future transmission needs in each area are discussed below. Planned projects (solid red on the geographic maps indicate ISO-NE approval. Proposed projects (dotted red, on the geographic maps) are alternative projects under assessment and do not have ISO-NE approval. Station reinforcements are identified by single line entries under the "from" station title in the supporting tables. Transmission line reinforcements are identified by entries under the "from" and "to" station titles in the supporting tables. The term "station" is interchangeable with substation or switching station. Tables 4-1 through 4-5 in the following sections include information on the project's proposed in-service date ("ISD"); however, these dates may change subject to system needs.

In the future, significant changes in the geographic patterns of generating capacity and loads may affect transmission flows and transmission requirements in Connecticut and New England, and may ultimately require enhancements to the transmission system beyond those currently being considered. The addition of significant amounts of remote renewable generating capacity or the retirement of local generation may increase the need to import power into Connecticut, via an expanded New England transmission system.

Included for 2012 is the ISO-NE Regional System Plan ("RSP") status and or CL&P's Local System Plan ("LSP") status. The transmission projects listed in the six Connecticut areas are documented in the 2011 ISO-NE RSP project listing and on Northeast Utilities Local System Plan for 2011 located at www.transmission-nu.com/business/ferc890 postings.asp.

4.7.1 Southwest Connecticut Area

The SWCT, shown in Figure 4-2, is the largest load area within Connecticut and comprises fifty-four towns including all of UI's 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.

Figure 4-2: Geographic Map of SWCT

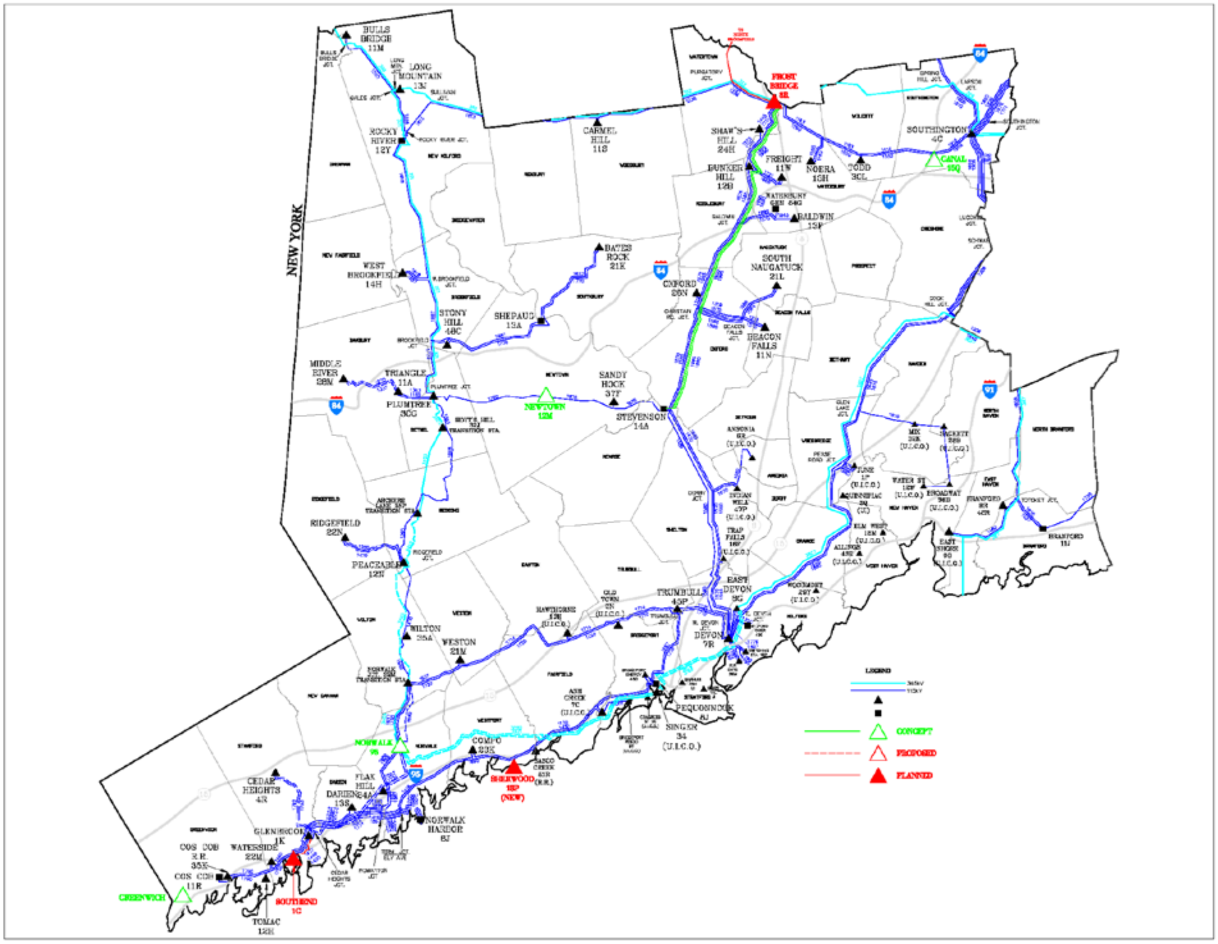


Table 4-1A: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP Status
Frost Bridge	**Watertown**	**Stevenson**	**Monroe**	**115**	**2014**	**20.5**	**Replace structures**	**Concept**
Glenbrook	**Stamford**	**South End**	**Stamford**	**115**	**TBD**	**TBD**	**Underground Cables**	**Proposed**

Table 4-1B: Proposed Substation Projects in SWCT

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Sherwood	**Westport**	**115/13.8**	**2012**	**Add a new substation**	**Under Construction**
Newtown	**Newtown**	**115/13.2**	**2012**	**Add a distribution transformer**	**Concept**
South End	**Stamford**	**115/13.2**	**2013**	**Add a distribution transformer and make South End a five-breaker**	**Planned**
Norwalk	**Norwalk**	**115/13.2**	**2014**	**Add a distribution transformer**	**Concept**
Canal	**Southington**	**115/23**	**2015**	**Add a distribution transformer**	**Concept**
Frost Bridge	**Watertown**	**345/115**	**2017**	**NEEWS – (CCRP)**	**Planned**
Greenwich	**Greenwich**	**115/13.2**	**2017**	**Add a new substation**	**Concept**

CL&P has completed a reliability assessment and is investigating solutions for the transmission corridors between Frost Bridge and Devon Substation and between Frost Bridge and Plumtree Substation. In addition, the Stamford area will require improvements to the Stamford-Greenwich 115-kV transmission system.

Table 4-1A lists a reliability upgrade to the 115-kV transmission system and a proposed 115-kV transmission line in the Stamford area. Table 4-1B contains a listing of future substation projects that will require transmission upgrades to integrate these facilities into SWCT's regional grid. At the Newtown, South End, Norwalk, Canal and Greenwich substations the projected reinforcement plans include the installation of additional distribution transformation capability. The Sherwood Substation is a new distribution facility now under construction and needed to reliably serve local area load. Also, substation modifications are planned at Frost Bridge Substation in support of the Central Connecticut Reliability NEEWS Project. The needs reassessment of the Central Connecticut Reliability Project components of NEEWS (the fourth and last component) has been combined with the Hartford and Middletown studies to become the Greater-Hartford-Central Connecticut study and is in assessment stages.

The Southwest Connecticut (SWCT) working group presented the need assessment for this area at the January 19, 2011 ISO-NE Planning Advisory Committee meeting. In November, 2011 a SWCT update on Continuing Alternatives Analysis was presented to the ISO-NE

Planning Advisory Committee. The need included the addition of a third source into the Stamford area from Glenbrook Substation. Also included was an update regarding solutions being considered for the transmission corridors between Frost Bridge Substation and Devon Substation and between Frost Bridge Substation and Plumtree Substation.

4.7.2 Manchester - Barbour Hill Area

The Manchester - Barbour Hill Area, shown in Figure 4-3, 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 growth along the Interstate 91 and 84 corridors, especially in Manchester and South Windsor adjacent to the Buckland Hills Mall, has resulted in a need to upgrade the transmission network. Table 4-2 lists one transmission line project in the Manchester – Barbour Hill area.

Figure 4-3: Geographic Map of the Manchester – Barbour Hill Area

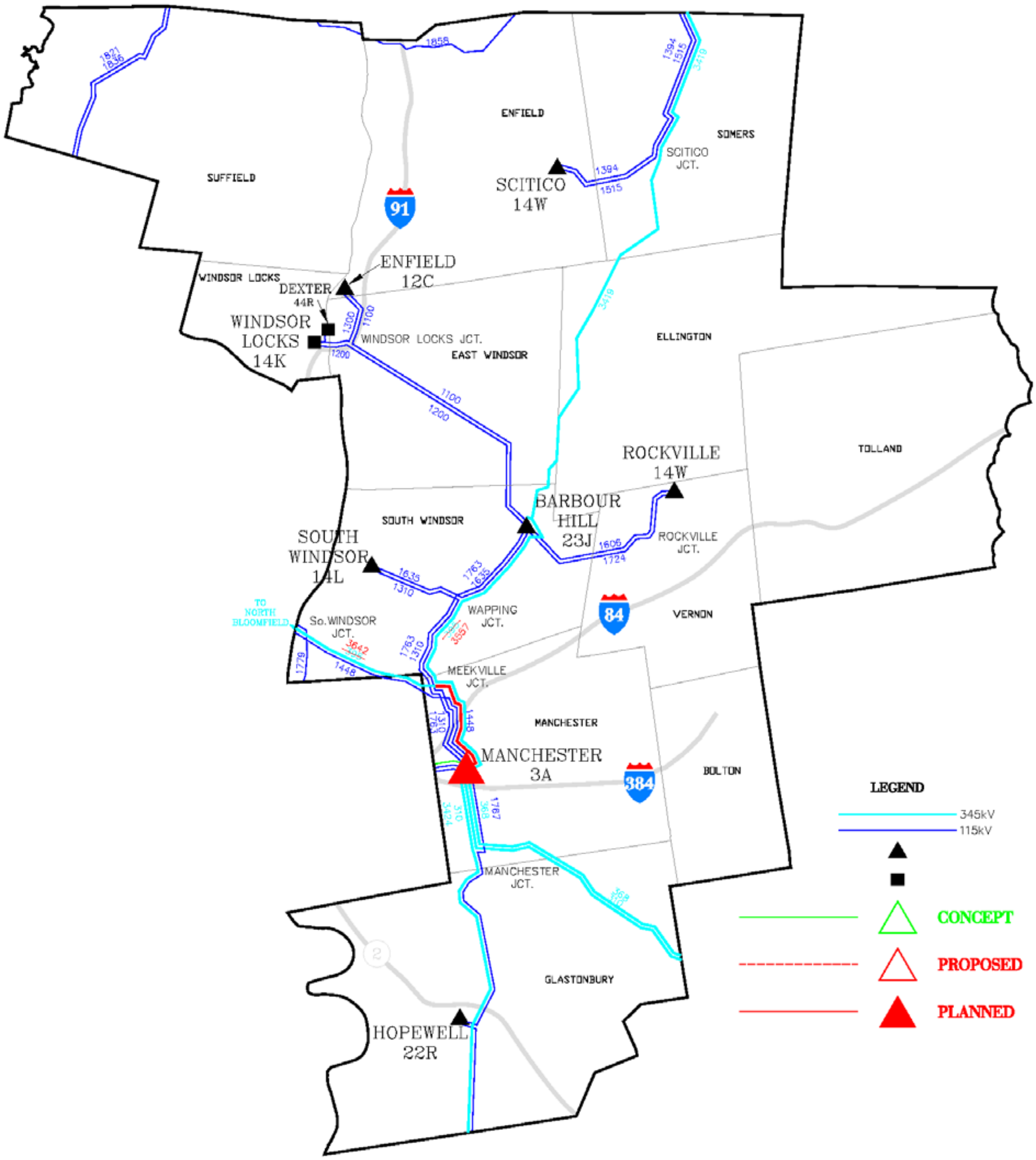


Table 4-2: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP Status
Manchester	**Manchester**	**Meekville Jct.**	**Manchester**	**345**	**2013**	**2.7**	**Split 3-terminal line***	**Under Construction**

*The MMP variation that was approved by the Connecticut Siting Council in 2010. Note: Presently, there are no substation projects proposed in the Manchester – Barbour Hill Area.

The Manchester to Meekville Junction Project is presently under construction with an in-service date of 2013.

4.7.3 Eastern Connecticut Area

The Eastern Connecticut Area, shown in Figure 4-4, extends from the Rhode Island border in a westerly direction for about twenty miles and north from Long Island Sound to the Massachusetts border. The area is served by both CL&P and CMEEC.

Figure 4-4: Geographic Map of the Eastern Connecticut Area

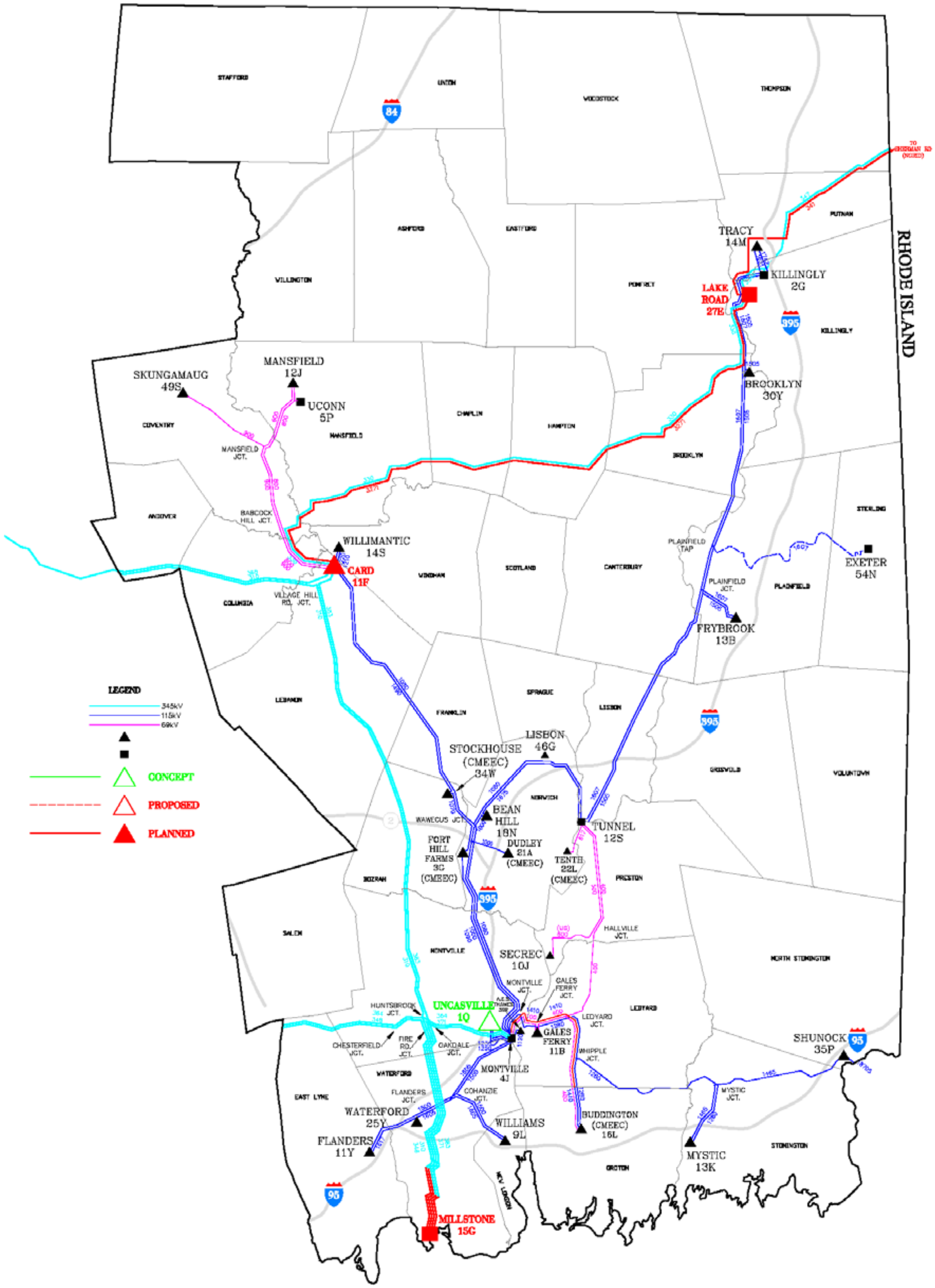


Table 4-3A: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP Status
Millstone	**Waterford**	**Manchester**	**Manchester**	**345**	**2013**	**4.0**	**Circuit separation**	**Planned**
Millstone	**Waterford**	**Haddam/ Beseck**	**Haddam/ Wallingford**	**345**	**2013**	**4.0**	**Circuit separation**	**Planned**
Millstone	**Waterford**	**Montville**	**Montville**	**345**	**2013**	**2.0**	**Circuit separation**	**Planned**
Millstone	**Waterford**	**Card**	**Lebanon**	**345**	**2013**	**2.0**	**Circuit separation**	**Planned**
Card	**Lebanon**	**Lake Road**	**Killingly**	**345**	**2015**	**29.3**	**NEEWS - Interstate**	**Planned**
Lake Road	**Killingly**	**CT/RI Border**	**Thompson**	**345**	**2015**	**7.6**	**NEEWS - Interstate**	**Planned**
Montville	**Montville**	**CL&P/CMEEC Border**	**Ledyard**	**115**	**2015**	**6.8**	**Line Sag elimination**	**Planned**
Millstone	**Waterford**	**Manchester/Card**	**Manchester/ Lebanon**	**345**	**TBD**	**N/A**	**Loop 310 line into Card**	**Planned**

Table 4-3B: Proposed Substation Projects

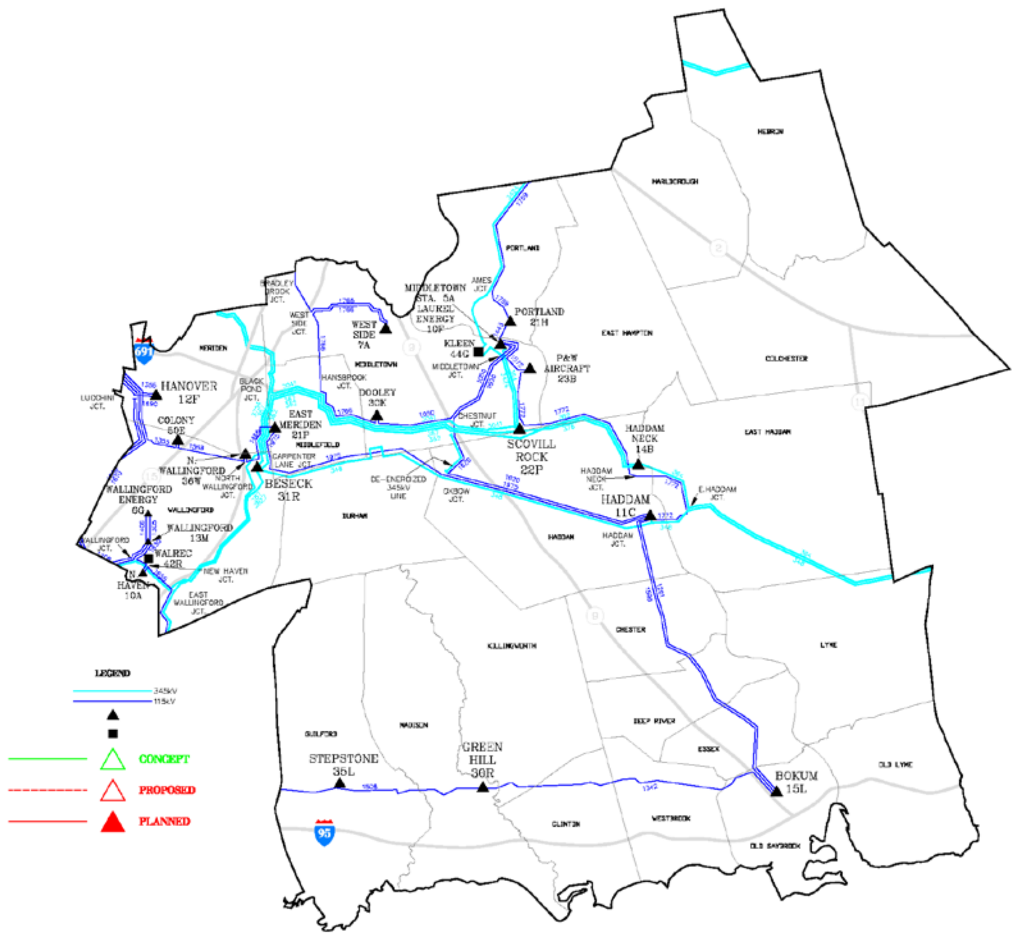
Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Uncasville	**Montville**	**115/13.2**	**2015**	**Replace both transformers with larger capacity transformers**	**Concept**
Card	**Lebanon**	**345**	**2015**	**NEEWS - Interstate**	**Planned**
Lake Road	**Killingly**	**345**	**2015**	**NEEWS - Interstate**	**Planned**

Table 4-3A lists two circuit separations (i.e., two double-circuit line segments become four single-circuit line segments) and the transmission circuit additions and or upgrade associated with the Interstate Reliability Project, one of the NEEWS Projects. The last entry loops the 310 345-kV Millstone to Card line into Card Substation in Lebanon. This project is currently under reevaluation as part of the Greater Hartford Central Connecticut Project and is not shown on the map. Table 4-3B lists a proposed reliability upgrade at the Uncasville substation. Also, included are the future 345-kV substation modifications planned for the Card and Lake Road substations in regard to the Interstate Reliability NEEWS Project. On December 23, 2011 CL&P applied to the CSC for a Certificate of Environmental Compatibility and Public Need for approval to construct the Connecticut portion of the Interstate Reliability Project.

4.7.4 Middletown Area

The Middletown Area, shown in Figure 4-5, 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 Kleen Energy facility in this area was placed in service in July 2011. At present there are no proposed transmission line or substation projects in this area that would have been included in Tables 4-4A and 4-4B respectively. This area is currently being evaluated under the Greater-Hartford-Central Connecticut study.

Figure 4-5: Geographic Map of the Middletown Area



4.7.5 Greater Hartford Area

The Greater Hartford Area, shown in Figure 4-6, is 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.

Figure 4-6: Geographic Map of the Greater Hartford Area

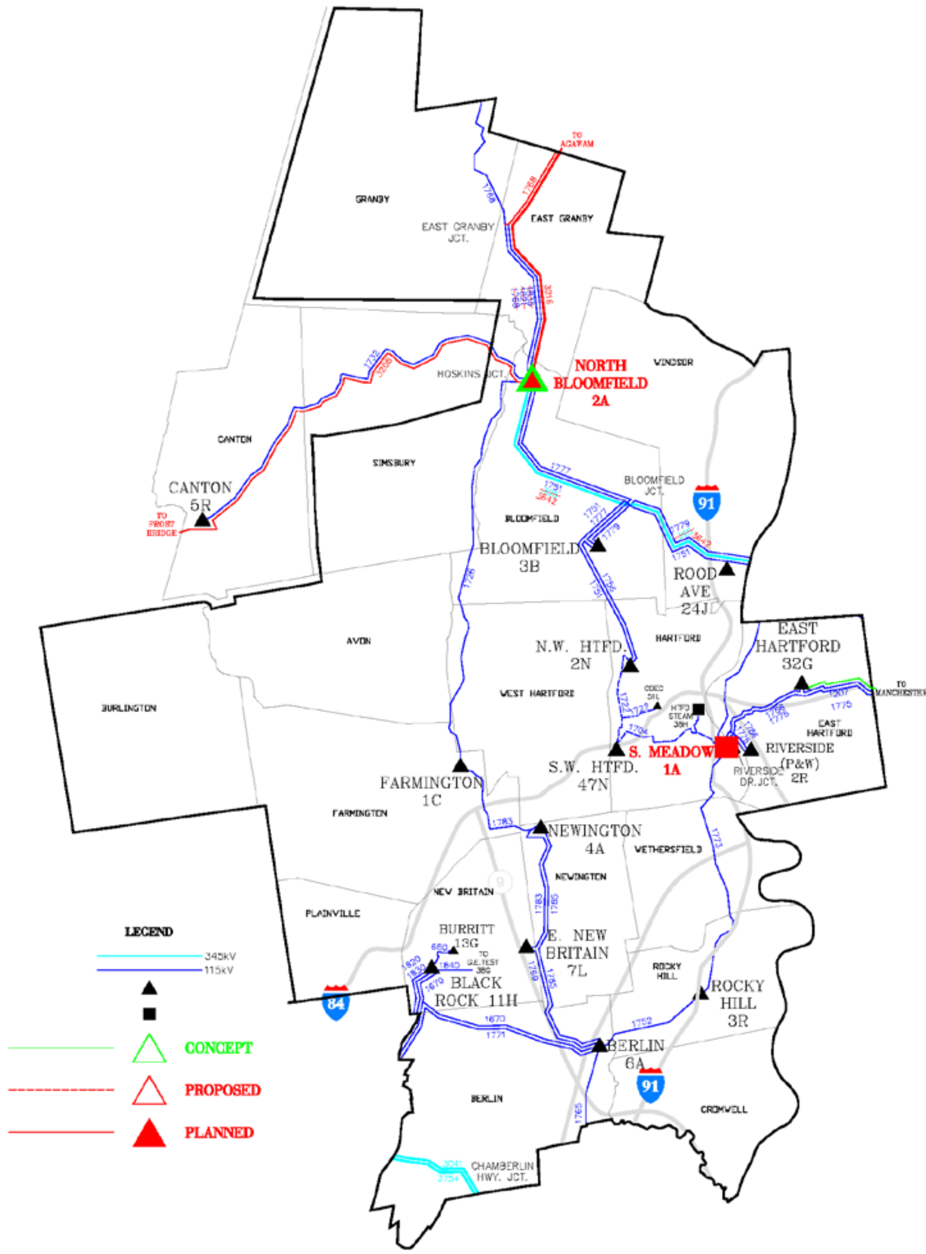


Table 4-5A: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP Status
North Bloomfield	**Bloomfield**	**CT/MA Border**	**Suffield**	**345**	**2013**	**12.0**	**NEEWS – GSRP**	**Under Construction**
North Bloomfield	**Bloomfield**	**CT/MA Border**	**Suffield**	**115**	**2013**	***11.9**	**NEEWS – GSRP**	**Under Construction**
North Bloomfield	**Bloomfield**	**CT/MA Border**	**Suffield**	**115**	**2013**	***11.9**	**NEEWS – GSRP**	**Under Construction**
North Bloomfield	**Bloomfield**	**CT/MA Border**	**Granby**	**115**	**2013**	***8.7**	**NEEWS – GSRP**	**Under Construction**
Manchester	**Manchester**	**East Hartford**	**East Hartford**	**115**	**TBD**	**3.2**	**New transmission line**	**Concept**

*Actual existing line mileage in Connecticut, portions of which will be removed. Remaining sections of each line will be connected together to operate as a part of a single South Agawam to Southwick 115-kV circuit.

Table 4-5B: Proposed Transmission Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
North Bloomfield	**Bloomfield**	**345**	**2013**	**NEEWS - GSRP**	**Under Construction**
South Meadow	**Hartford**	**115**	**2013**	**Upgrade to Bulk Power System requirements**	**Planned**
North Bloomfield	**Bloomfield**	**115/23**	**2015**	**Add a distribution transformer**	**Concept**

Table 4-5A contains a listing of future transmission reinforcement projects for the Greater Hartford area. The table identifies transmission line projects associated with NEEWS Greater Springfield Reliability Project. One new 345-kV transmission circuit is planned to tie the North Bloomfield Substation with the new 345/115-kV substation additions in Agawam, Massachusetts. In addition, the three existing 115-kV transmission circuits from North Bloomfield Substation to Massachusetts substations will be disconnected from North Bloomfield Substation and modified. The GSRP project is presently under construction. Table 4-5B includes 345-kV modifications which are under construction for the 345-kV North Bloomfield Substation in regard to the NEEWS GSRP project. Also included is a Bulk Power System requirement at the South Meadow Substation in Hartford. The needs reassessment of the Central Connecticut Reliability Project component of NEEWS is now part of the Greater-Hartford-Central Connecticut study.

4.7.6 Northwestern Connecticut Area

The Northwestern Connecticut Area, shown in Figure 4-7, 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.

Figure 4-7: Geographic Map of the Northwestern Connecticut Area

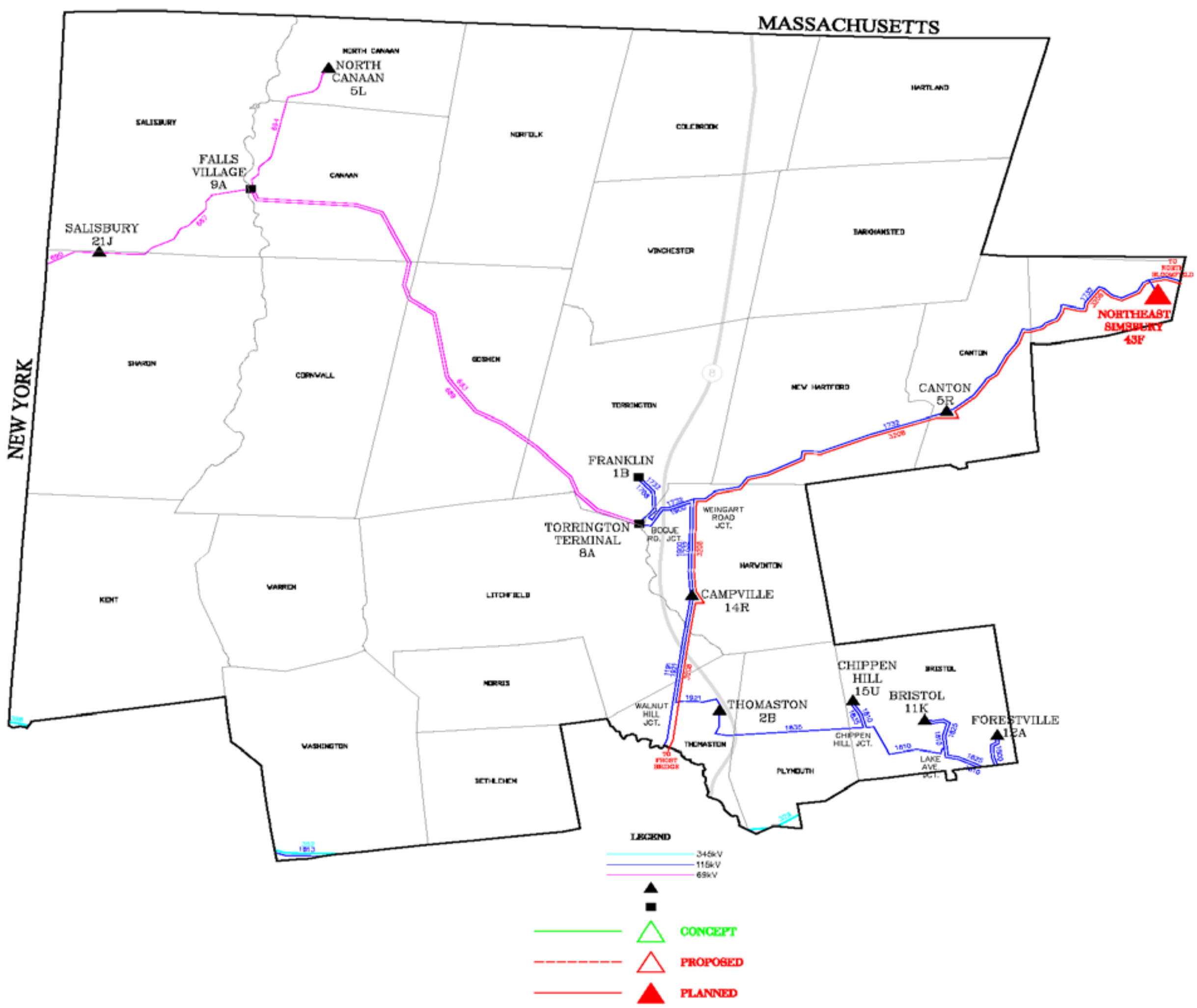


Table 4-6A: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP Status
Frost Bridge	**Watertown**	**North Bloomfield**	**Bloomfield**	**345**	**2017**	**35.4**	**NEEWS - CCRP**	**Planned**

Table 4-6B: Proposed Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Northeast Simsbury	**Simsbury**	**115**	**TBD**	**Breaker Addition**	**Planned**

Table 4-6A identifies a transmission line project associated with NEEWS. This project includes a new 345-kV circuit between the North Bloomfield Substation in Bloomfield and the Frost Bridge Substation, in Watertown, Connecticut. The needs reassessment of the Central Connecticut Reliability Project components of NEEWS has been combined with the Hartford and Middletown studies to become the Greater-Hartford-Central Connecticut study and is in early stages. In the Torrington, Salisbury, and North Canaan area, CL&P is also evaluating the existing 69-kV transmission system. Table 4-6B lists a proposed reliability upgrade at the Northeast Simsbury Substation.

4.8 Incorporation of Renewables through Transmission including future outlook

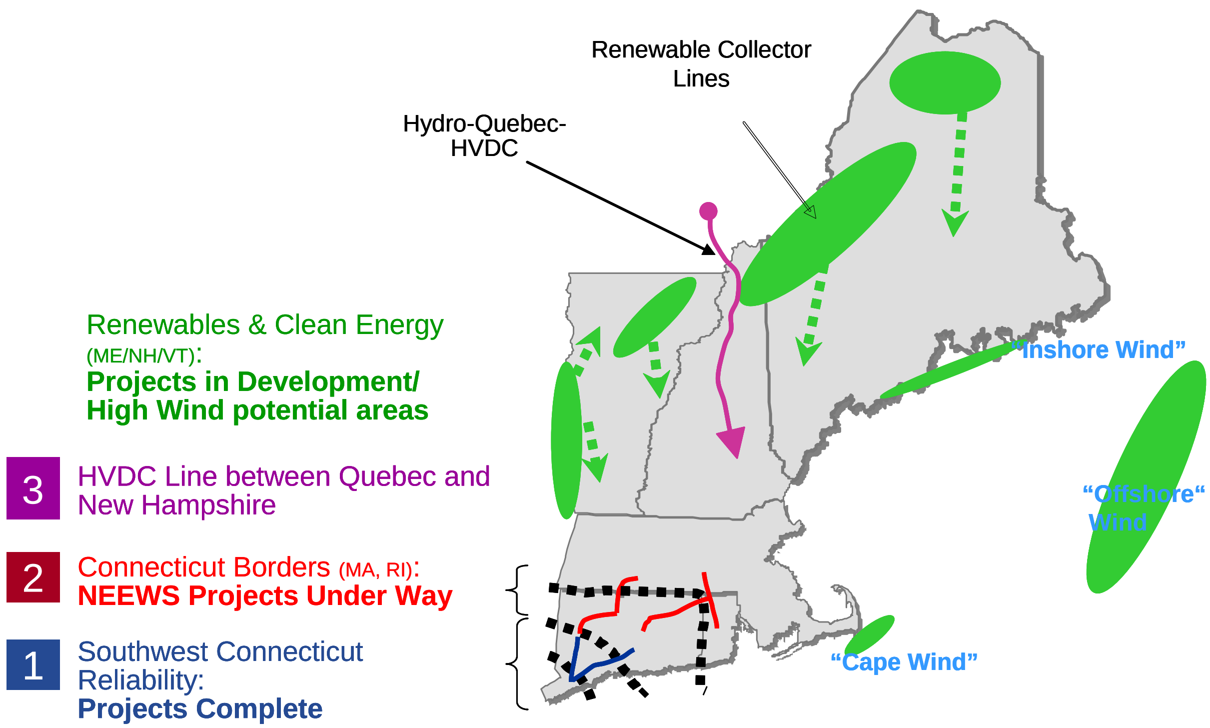
Transmission plays an essential role in providing access to remote renewable electric energy resources. Renewable resources like wind and hydro power will likely not be sited close to load centers, so transmission will be needed to move this power to the load. The prospect of transporting renewable energy from northern New England and Canada is particularly promising.

Long-term forecasts show surplus renewable generation in the eastern provinces of Canada and insufficient generation in Ontario, New York, and New England. Strengthening Connecticut's transmission interconnection with the rest of New England will give the state an opportunity to share in the region's access to Canada's projected surplus power. NU and NSTAR have studied various options and have proposed a high-voltage direct current transmission tie line with Hydro Quebec (Northern Pass Transmission Project "NPT") which would provide New England access to competitively priced non-carbon emitting hydroelectric power.

The NPT has received FERC approval of a transmission service agreement with Hydro Renewable Energy Inc. (Hydro Quebec) and the federal siting approval process with the U.S. Department of Energy has begun.

The Eastern Interconnection Planning Collaborative (“EIPC”) is a first-ever effort to involve Planning Authorities in the entire Eastern Interconnection in analyzing various energy policy options of interest to state, provincial, and federal policy makers

Figure 4-8: Map of Potential Renewable Resources



4.9 Underground Transmission and Cost

Transmission line siting dockets in recent years have established that the electrical characteristics and other attributes of underground transmission lines make such lines difficult to incorporate within the existing Connecticut transmission system, especially at 345-kV. System reliability issues created by underground lines are not always feasible or inexpensive to manage. Public concern over the magnetic fields that surround power transmission lines has been a driver for public pressures to construct new transmission lines underground; however, underground transmission lines also produce magnetic fields in publicly accessible locations.

Some of CL&P’s recent transmission line projects have required applications of underground transmission cables, including cables operating at 345 kV. As part of CL&P’s Bethel-Norwalk Project, 6.4 miles of existing 115-kV overhead transmission line was replaced by approximately ten miles of underground 115-kV transmission cables. Approximately twelve miles of parallel 345-kV underground cables also entered service in 2006 as part of a new 20.4-mile long 345-kV circuit, including a first use of 2.1 miles of solid dielectric cables. As part of the Middletown-Norwalk Project, CL&P’s new transmission facilities as of 2009 include approximately thirty-four new circuit miles of underground 345-kV solid dielectric cables, and one mile of overhead 115-kV line was replaced by underground 115-kV cables. Also, two new 115-kV underground cable circuits, each almost nine miles long, were completed as part of the Glenbrook Cables Project. Finally, the Long Island Cable Project from Norwalk Harbor to Northport Long Island, New York was completed in 2008. One of the Middletown-Norwalk cables failed in 2010 causing a circuit to be out of service for 5 weeks. And one of the new cables in Long Island Sound failed in 2009 leading to an outage of one circuit for approximately 2.5 years.

Cost

The CSC's 2007 Life-Cycle Costs of Electric Transmission Lines Report made clear that the initial and life-cycle costs of underground 115-kV and 345-kV transmission line are typically several times higher than the cost of an equal length of overhead transmission line when sufficient right-of-way already exists to accommodate the overhead line. CL&P expects that the Council's 2012 update of this report will show a similar comparison.