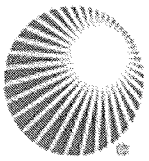

Connecticut
Light & Power

A Northeast Utilities Company

2013 Forecast of Loads and Resources

For the Period 2013-2022

March 1, 2013

Northeast Utilities

107 Selden Street, Berlin, CT 06037

Northeast Utilities
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Hartford, CT 06141-0270
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March 1, 2013

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

Re: CL&P 2013 Forecast of Loads and Resources for the Period 2013-2022

Dear Mr. Stein,

Submitted herewith, on behalf of The Connecticut Light & Power Company ("CL&P" or the "Company"), are 20 copies of the Company's 2013 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 at (860) 665-3566 if you have any questions with respect to this filing.

Very truly yours,

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

Enclosure

cc: Kimberley J. Santopietro, PURA

List of Acronyms

"ACEEE"	American Council for an Energy Efficiency Economy
"C&LM"	Conservation and Load Management
"CAGR"	Compound Annual Growth Rate
"CCEF"	Connecticut Clean Energy Fund
"CCRP"	Central Connecticut Reliability Project
"CEAB"	Connecticut Energy Advisory Board
"CES"	Comprehensive Energy Strategy
"CL&P"	The Connecticut Light & Power Company
"CSC"	Connecticut Siting Council
"CMEEC"	Connecticut Municipal Electric Energy Cooperative, Inc.
"DEEP"	Department of Energy and Environmental Protection
"DPUC"	Department of Public Utility Control
"DG"	Distributed Generation
"EEB"	Energy Efficiency Board
"EDC"	Electric Distribution Company
"EIPC"	Eastern Interconnection Planning Collaborative
"EPA"	Energy Purchase Agreements
"ERO"	Electric Reliability Organization
"EV"	Electric Vehicles
"FCA"	ISO-NE Forward Capacity Auction
"FCM"	ISO-NE Forward Capacity Market
"FERC"	Federal Energy Regulatory Commission
"FLR"	Forecast of Loads and Resources
"GHCC"	Greater Hartford/Central Connecticut
"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
"LDC"	Local Distribution Companies
"LREC"	Low Emission Renewable Energy Credits
"MRA"	Market Resource Alternative
"MW"	Megawatt or 1,000,000 Watts
"NEEWS"	New England East — West Solution
"NERC"	North American Electric Reliability Corporation
"NPCC"	Northeast Power Coordinating Council

List of Acronyms, Continued

"NPT"	Northern Pass Transmission Project
"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")
"PAC"	Planning Advisory Committee
"PURA"	Public Utilities Regulatory Authority
"REC"	Renewable Energy Certificate
"RGGI"	Regional Greenhouse Gas Initiative
"ROFR"	Federal First Refusal
"RPS"	Renewable Portfolio Standards
"RSP"	ISO-NE's Regional System Plan
"SWCT"	ISO-NE Southwest Connecticut Zone
"SWCT WG"	The Southwest Connecticut Working Group
"TO"	Transmission Owners
"UI"	The United Illuminating Company
"WMECO"	Western Massachusetts Electric Company
"ZREC"	Zero Emission Renewable Energy Credit

Table of Contents

Chapter 1: INTRODUCTION

1.1 Overview of CL&P's 2013 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 approximately forty years. This 2013 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 weather can especially have a large impact on the realization of any forecast. CL&P's electric energy usage is expected to decrease by a weather-normalized compound annual growth rate ("CAGR") of 0.4% per year, and peak demand is expected to grow by a weather-normalized CAGR of 0.2% per year over the 10-year forecast period from 2013 through 2022.

While CL&P is providing its forecast developed for financial forecasting purposes, CL&P uses Independent System Operator - New England ("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 sold its generation assets, while remaining a Connecticut electric distribution and transmission company. Since that time, the state has enacted a number of policies and programs which affect the developing wholesale electric market in the region.

State-Mandated Integrated Resource Planning

In 2007, the Connecticut legislature passed PA 07-242, *An Act Concerning Electricity and Energy Efficiency ("PA 07-242")*, directing 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 Connecticut Energy Advisory Board ("CEAB") and the Electric Distribution Companies ("EDCs").

On June 14, 2012, DEEP issued its Final 2012 IRP for Connecticut presenting a comprehensive plan for improving Connecticut's electric energy future. The analysis performed for the IRP supports this plan, which includes a sustained commitment to expanded energy efficiency, further analysis of Renewable Portfolio Standard issues, careful monitoring of resource supplies, deployment of microgrids through a pilot program, and other steps outlined above. This plan will help Connecticut customers reduce the volume of consumption and, thus, save money when market-wide cost factors pressure rates; facilitate the development of low-cost, clean energy resources that are economic but may face barriers to implementation; find cost-effective ways to meet the clean energy objectives of the renewable targets; and support in-state jobs. Key findings included the following:

- CT's electricity consumption declined sharply during the economic recession, and is not expected to exceed 2005 levels until 2022
- Adequate generating resources will likely be available in CT to serve electricity loads reliably through 2022.
- The deliverability of natural gas fuel to electric generators requires monitoring to assure the reliability of electricity supply.
- CT is beginning to experience a lower GSC rate, and can expect the downward trend to continue over the next 5 years.
- Between 2017 and 2022, the GSC rate is projected to rise by more than 3 ¢/kWh in real terms.
- Air pollution emissions in CT have decreased, as low-cost natural gas-fired generation is displacing coal- and oil-fired generation.
- A gap between projected available renewable generation and demand mandated by CT's and other New England states' renewable generation targets is expected to emerge in 2018.

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 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 2013-2015 C&LM 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.

The C&LM Plan comports with the DEEP findings in the IRP and is projected to deliver electric savings of approximately 2.1 percent of sales per year on average over the three-year period. Recommendations from the state's recently drafted Comprehensive Energy Plan ("CES") are

also integrated into this 3-year Plan. The 2013-2015 C&LM Plan represents a continuation of integrating the C&LM plans for both the EDCs and Natural Gas Local Distribution Companies ("LDCs"), to benefit electric and gas customers and to reduce duplicative efforts.

The three-year Plan contains two related yet distinct plans comprising two different levels of energy savings and funding. First, the Expanded Plan describes the programs, strategies, budgets and increased funding levels necessary to achieve the State's increased savings goals. Additionally, a Base Plan chapter is included which reflects the standard three-year budgets and savings associated with the traditional funding sources (mil rate, etc.) for a C&LM base three-year plan in the event funding for the Expanded Plan is not available.

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's transmission facilities are part of the New England regional grid and must be designed, operated and maintained to ensure compliance with mandatory North American Electric Reliability Corporation ("NERC") reliability standards.

- 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.

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 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 2012 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 deliver electric power to customers. In this report CL&P discusses its efforts to build and maintain a reliable transmission system for delivering energy to its customers and the region.

Chapter 2: FORECAST OF LOADS AND RESOURCES

Chapter Highlights

- Although electric energy usage is expected to decline by 0.4% per year over the 10-year forecast period, peak demand is expected to grow by 0.2% per year during this time.
- While CL&P uses its own Reference Plan Forecast for financial forecasting, the Company uses Independent System Operator - New England ("ISO-NE's") load forecast for transmission planning purposes.

2.1 Electric Energy and Peak Demand Forecast

The energy and peak demand forecasts contained in this chapter are based on the Company's budget forecast, which was prepared in August 2012, 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, projected reductions resulting from distributed generation ("DG") projects developed in accordance with Public Act 05-01, *An Act Concerning Energy Independence* ("PA 05-01") and projected reductions resulting from low and zero emission renewable energy credits ("LREC/ZREC") developed in accordance with Public Act 11-80.

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 decline in the weather-normalized CAGR for total electrical energy output requirements of 0.4% for CL&P from 2012-2022. Without the Company's C&LM programs, DG or LREC/ZREC resources, the forecasted energy growth rate would be 1.1%.

The weather-normalized CAGR for summer peak demand in the Reference Plan *Peak Demand* Forecast is forecasted to be 0.2% over the ten-year forecast period. Similarly, if CL&P's C&LM, DG and LREC/ZREC programs, along with the ISO-NE load response programs, were excluded, the CAGR for forecasted peak demand would be 1.4%.

Table 2-1 provides historic output and summer peaks, actual and normalized for weather, for the 2008-2012 period, and forecast output and peaks for the 2013-2022 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 mean daily temperature for the summer peak day is 82° 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 six major areas of uncertainty that are inherent to this forecast.

- The Economy - The Reference Plan Forecast is based on an economic forecast that was developed in July 2012. 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.
- Low & Zero Emission Renewable Energy Credits ("LREC/ZREC") – This forecast includes explicit reductions to electrical energy output requirements due to renewable energy credits. The LREC/ZREC program was created by the Connecticut General Assembly in 2011 as part of an energy policy reform bill.
- Electric Prices - This forecast assumes that total average electric prices will continue to decrease in 2013, 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 74° F to 88° 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

[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%.

[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.

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 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 2022 summer peak forecast reflecting average peak-producing weather is 5,121 MWs. However, either extremely mild or extremely hot weather could result in a range of potential peak loads from 4,396 MWs to 5,731 MWs. This 1,335 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 2013 Reference Plan Forecast

Year	Net Electrical Energy Output Requirements		Reference Plan (50/50 Case)			Extreme Hot Scenario			Extreme Cool Scenario		
	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											
2008	24485		5289		0.527						
2009	23364	-4.6%	4873	-7.9%	0.547						
2010	23931	2.4%	5345	9.7%	0.511						
2011	23494	-1.8%	5516	3.2%	0.486						
2012	23231	-1.1%	5280	-4.3%	0.501						
Compound Rates of Growth (2008-2012)											
	-1.3%		0.0%								
HISTORY NORMALIZED FOR WEATHER *											
2008	24467		5184		0.537						
2009	23735	-3.0%	4935	-4.8%	0.549						
2010	23484	-1.1%	4994	1.2%	0.537						
2011	23286	-0.8%	5279	5.7%	0.504						
2012	23196	-0.4%	5039	-4.5%	0.524						
Compound Rates of Growth (2008-2012)											
	-1.3%		-0.7%								
FORECAST											
2013	23273	0.3%	5048	0.2%	0.526	5658	12.3%	0.470	4323	-14.2%	0.615
2014	23453	0.8%	5091	0.8%	0.526	5700	0.8%	0.470	4366	1.0%	0.613
2015	23433	-0.1%	5118	0.5%	0.523	5727	0.5%	0.467	4392	0.6%	0.609
2016	23388	-0.2%	5140	0.4%	0.518	5750	0.4%	0.463	4415	0.5%	0.603
2017	23149	-1.0%	5150	0.2%	0.513	5759	0.2%	0.459	4424	0.2%	0.597
2018	22927	-1.0%	5141	-0.2%	0.509	5750	-0.2%	0.455	4415	-0.2%	0.593
2019	22748	-0.8%	5133	-0.1%	0.506	5743	-0.1%	0.452	4408	-0.2%	0.589
2020	22616	-0.6%	5122	-0.2%	0.503	5732	-0.2%	0.449	4397	-0.2%	0.586
2021	22417	-0.9%	5123	0.0%	0.500	5732	0.0%	0.446	4397	0.0%	0.582
2022	22281	-0.6%	5121	0.0%	0.497	5731	0.0%	0.444	4396	0.0%	0.579
Compound Rates of Growth (2012-2022)											
	-0.4%		-0.3%			0.8%			-2.0%		
Normalized Compound Rates of Growth (2012-2022)											
	-0.4%		0.2%			1.3%			-1.5%		

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

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

Net Electrical Energy Output Requirements

Year	Unadjusted Output GWH	Renewable Energy Credits GWH	Distributed Generation GWH	Company Sponsored C&LM GWH	ISO-NE Load Response GWH	Adjusted Output GWH	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2012						23,196	
FORECAST							
2013	23,977	(44)	(634)	(25)	-	23,273	0.3%
2014	24,384	(157)	(636)	(138)	-	23,453	0.8%
2015	24,689	(257)	(636)	(362)	-	23,433	-0.1%
2016	25,028	(358)	(638)	(644)	-	23,388	-0.2%
2017	25,169	(459)	(635)	(925)	-	23,149	-1.0%
2018	25,300	(529)	(636)	(1,207)	-	22,927	-1.0%
2019	25,428	(555)	(636)	(1,488)	-	22,748	-0.8%
2020	25,579	(555)	(638)	(1,770)	-	22,616	-0.6%
2021	25,659	(555)	(635)	(2,051)	-	22,417	-0.9%
2022	25,806	(555)	(636)	(2,333)	-	22,281	-0.6%
Normalized Compound Rates of Growth (2012-2022)							
	1.1%					-0.4%	

Reference Plan (50/50 Case)

Year	Unadjusted Peak MW	Renewable Energy Credits MW	Distributed Generation MW	Company Sponsored C&LM MW	ISO-NE Load Response MW	Adjusted Peak MW	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2012						5,039	
FORECAST							
2013	5,221	(4)	(54)	(14)	(100)	5,048	0.2%
2014	5,322	(13)	(54)	(64)	(100)	5,091	0.8%
2015	5,424	(22)	(54)	(130)	(100)	5,118	0.5%
2016	5,523	(31)	(55)	(197)	(100)	5,140	0.4%
2017	5,590	(39)	(54)	(247)	(100)	5,150	0.2%
2018	5,635	(45)	(54)	(294)	(100)	5,141	-0.2%
2019	5,675	(48)	(54)	(340)	(100)	5,133	-0.1%
2020	5,708	(48)	(55)	(383)	(100)	5,122	-0.2%
2021	5,751	(48)	(54)	(426)	(100)	5,123	0.0%
2022	5,791	(48)	(54)	(468)	(100)	5,121	0.0%
Normalized Compound Rates of Growth (2012-2022)							
	1.4%					0.2%	

Extreme Hot Weather Scenario

Year	Unadjusted Peak MW	Renewable Energy Credits MW	Distributed Generation MW	Company Sponsored C&LM MW	ISO-NE Load Response MW	Adjusted Peak MW	Annual Change (%)
HISTORY NORMALIZED FOR WEATHER							
2012						5,039	
FORECAST							
2013	5,830	(4)	(54)	(14)	(100)	5,658	12.3%
2014	5,932	(13)	(54)	(64)	(100)	5,700	0.8%
2015	6,033	(22)	(54)	(130)	(100)	5,727	0.5%
2016	6,132	(31)	(55)	(197)	(100)	5,750	0.4%
2017	6,200	(39)	(54)	(247)	(100)	5,759	0.2%
2018	6,244	(45)	(54)	(294)	(100)	5,750	-0.2%
2019	6,284	(48)	(54)	(340)	(100)	5,743	-0.1%
2020	6,317	(48)	(55)	(383)	(100)	5,732	-0.2%
2021	6,360	(48)	(54)	(426)	(100)	5,732	0.0%
2022	6,401	(48)	(54)	(468)	(100)	5,731	0.0%
Normalized Compound Rates of Growth (2012-2022)							
	2.4%					1.3%	

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 nine years, the EDCs have entered into long-term power-purchase agreements with Class I renewable energy resource projects, in cooperation with the Connecticut Clean Energy Fund ("CCEF") and under the direction of the Public Utilities Regulatory Authority ("PURA"), formerly known as the Department of Public Utility Control ("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)												
Age	Nuclear	Natural Gas	Natural Gas / Light Oil	Residual Oil	Residual Oil / Natural Gas	Coal / Residual Oil	Coal	Light oil / Natural Gas	Light Oil	Oil / Gas / Light Oil	Other	Water	Total
Under contract to be built		33									38		71
<= 10 years old		13	620	69	507			504.8	52	170	1		1,937
<= 20 years old		666						118.197	12		15	0	811
<= 30 years old	1,225		59						14		153	10	1,461
<= 40 yeas old	875			400	448							8	1,731
<= 50 years old				420	234	363			286				1,323
Greater than 50 years old				330	198							99	627
Total	2,100	712	679	1,219	1,387	383	0	623	364	170	207	117	7,961

Sources / Notes

(1) Existing unit ratings from January 2013 ISO-NE seasonal claimed capability report at: http://www.iso-ne.com/genrtion_resrcs/snl_clmd_cap/2013/sco_january_2013.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 2012 ISO-NE CELT report at: http://www.iso-ne.com/trans/celt/report/2012/2012_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 over 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				
Plainfield Renewable Energy (Plainfield, CT)	37.5	30	2013	15
Stamford Hospital Fuel Cell CHP (Stamford, CT	4.8	4.8	2013	15
Waterbury Hospital Fuel Cell CHP (Waterbury, CT)	2.8	2.8	2013	15
Round 3				
DFC-ERG Glastonbury	3.4	3.4	2013	20
DFC-ERG Trumbull	3.4	3.4	2013	20
DFC-ERG Bloomfield	3.65	3.65	2013	20
Bridgeport Fuel Cell Park	14.93	14.93	2014	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 because 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 party 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, 2013 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 in service, having come on line in the Summer of 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 federally mandated congestion charges. The winning portfolio constituted a total maximum capacity of 787 MW and consisted of one new 620-MW combined cycle gas-fired base-load 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 new 96-MW peaking plant 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 presently has ownership or purchase entitlement interests and will maintain such interests during the 2013-2022 forecast period. All resources have winter and summer ratings in MWs as reported in ISO-NE's January 2013 seasonal claimed capability report, reflecting the effects of varying seasonal conditions, such as ambient air and water temperatures, on generator ratings. In 2010, the seasonal claimed capability ratings methodology was reformed for resources designated as intermittent power resources ("IPR") to use the method used to establish these resources' qualified capacity in the ISO-NE's Forward Capacity Market ("FCM"). The ratings in the tables reflect this change for those resources designated as IPR. As noted in prior forecasts and as of June 2010, capacity obligations will be measured and met principally using 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 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 2012/2013 and summer 2013. 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)
	2012/13	2013
Base	0.00	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	57.22	53.89
Purchase Total	57.22	53.89
Total Generation	57.22	53.89

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 they reflect past operating patterns.

2.2.3 Ten-Year Capacity Forecast

Tables 2-6 and 2-7 summarize the ten-year capacity forecast of supply resources for which CL&P will have ownership or entitlement interest during the summer and winter peak periods from 2013 through 2022. The tables have been simplified to reflect what was noted above, i.e., that these resources are sold in the wholesale market to offset contract cost obligations. 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, the 2012 IRP assumes they will continue to operate. The foregoing holds true even as CL&P is scheduled to take on load serving responsibility for 20% of Standard Service for the period July 1, 2013 through December 31, 2013. CL&P will not use these resources to meet its load serving entity obligations.

Table 2-6:
2013 – 2022 Summer Forecast of Capacity (MW) at the Time of Summer Peak

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
NET GENERATION AVAILABLE	53.89	53.89	41.67	38.67	22.37	22.37	13.76	13.76	0.25	0.25

Table 2-7:
2012/2013 – 2021/2022 Summer Forecast of Capacity (MW) at the Time of Winter Peak

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
NET GENERATION AVAILABLE	57.22	57.22	44.82	44.82	41.82	24.00	22.41	15.36	14.00	0.40

Resource Purchases

Table 2-8 provides a listing of existing cogeneration and small power production facilities (1 MW and above) located in Connecticut from which CL&P purchased power in 20012. The claimed winter and summer capacities of the generation at each production facility as of January 2013 are shown in this table. As a result of reforming the methodology used to rate IPRs, some facilities 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 CUSTOMER OWNED FACILITIES 1 MW AND ABOVE
PROVIDING GENERATION TO THE CONNECTICUT LIGHT & POWER COMPANY (1)

EXISTING & PROVIDED GENERATION TO CL&P DURING 2012

Project Name	Location	(2) 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 (3)							
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	622	-
Quinebaug	Danielson, CT	SPP	Hydro	-	2,161	1,354	48
Kinneytown B	Seymour, CT	SPP	Hydro	-	1,500	674	199
Mid-CT CRRA(So. Meadow 5/6)	Hartford, CT	SPP	Refuse	-	67,000	50,715	47,628
Preston (SCRRRA)	Preston, CT	SPP	Refuse	-	13,850	16,519	16,103
Bristol RRF	Bristol, CT	SPP	Refuse	-	13,200	12,402	12,217
Lisbon	Lisbon, CT	SPP	Refuse	-	13,500	13,608	13,462
Hartford Landfill	Hartford, CT	SPP	Methane	-	2,445	1,592	1,561
					126,850	107,536	101,268
FACILITIES NOT UNDER LONG TERM CONTRACT (4)							
Hartford Steam	Hartford, CT	COGEN	Gas	Steam	3,510	N/A	N/A
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
Rand-Whitney	Montville, CT	COGEN	Gas	Steam	14,200	N/A	N/A
Summit Hydro - Wyre Wynd	Jewett City, CT	SPP	Hydro	-	2,600	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	-	2,223	N/A	N/A
					59,033	0	0
				TOTAL EXISTING	185,883	107,536	101,268

(1) As a result of reforming the methodology used to rate IPRs, some facilities 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.
(2) "SPP" Denotes a Small Power Producer, "COGEN" Denotes a Cogenerator.
(3) Estimated Capacity Represents Contracted Capacity.
(4) 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 state of Connecticut come on-line as planned, including 506 MWs of peaking generation (see Section 2.2); and the completion of the New England East – West Solution ("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, including 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 seventh Forward Capacity Auction ("FCA") in February 2013 in which qualified capacity competed to provide 32,968 MWs needed in New England for reliability between June 2016 and May 2017. The FCA consisted of seven rounds, starting at a price of $15.00/kW-month for each of four capacity zones: Connecticut, NEMA / Boston, Maine and Rest-of-System. For all zones but NEMA / Boston bidding in the final round reached the minimum price established for this auction at $3.15/kW-month, with excess internal New England generation resources remaining. Connecticut had 769 MW of excess capacity. NEMA / Boston closed during the first round when the amount of capacity offered fell below the amount needed to meet the zone's local sourcing requirement.

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 2013 - 2015 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 2013 - 2015 Conservation and Load Management Plan

On November 1, 2012, a 2013 - 2015 Conservation & Load Management Plan ("C&LM Plan") was filed with the DEEP. The 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, and natural gas distribution companies, Connecticut Natural Gas Corporation, Southern Connecticut Gas Company, and Yankee Gas Services Company, in Docket 12-11-04, *PURA Review of the Connecticut Energy Efficiency Fund's Gas Conservation and Load Management Plan for 2013 through 2015.* The C&LM Plan is based upon input from members of the public, industry groups and private enterprise, and was developed in collaboration with the Energy Efficiency Board ("EEB"). A base budget and an increased savings scenario budget were presented in the C&LM Plan. In the C&LM Plan, CL&P proposed a base plan budget of approximately $84 million annually, and an increased savings scenario budget that ramps up from $156 million (2013) to $252 million (2015).

Funding for C&LM programs currently comes from several sources. Since the passage of the state's restructuring legislation in 1999, a 3 mil per kWh electric charge has served as the primary funding source.[3] This funding source is known as the Connecticut Energy Efficiency Fund, and it 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 2013, 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 emissions those power

[3] Conn. Gen. Stat. § 16-245m.

plants produce, and reducing consumer energy bills in all sectors: residential, commercial, industrial and municipal.

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 were created from the energy savings the programs deliver, as consumers and businesses spend and invest the money, which would otherwise have been 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 *2012 State Energy Efficiency Scorecard*, Connecticut ranked sixth in the nation. This ranking reflects the success of Connecticut's energy efficiency programs.[5] However, a 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 C&LM Plan.

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, these utilities are helping to shape a more energy-efficient consumer who not only participates in their award-winning programs, but who 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 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 and completed on June 14, 2012. The IRP recommends higher levels of energy efficiency spending consistent with the increased savings

[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%).

scenario in the 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.

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 in the CL&P service territory for the C&LM Plan base budget. Table 3-1B presents the potential cumulative annual energy savings and summer and winter peak-load reductions forecasted for C&LM programs in the CL&P service territory for the C&LM increased savings scenario. Forecast years starting in 2016 are based on similar programs and budgets as the 2013 – 2015 program years. The projected savings from C&LM programs have been shown as separate line items because the average duration of energy-efficiency program activities is greater than ten years, while load-response activities have a more immediate, short-term impact.

3.2 Forecast Sensitivity

The C&LM programs employ 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 C&LM Plan and expected future funding as described above. Any additional legislative or regulatory changes in geographic and program focus will produce results that may vary from these projections. In particular, adoption of the Integrated Resource Plan and the Increased Savings scenario described above would alter this forecast.

Table 3-1

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

Connecticut Light and Power

2013-2022

GWh Sales Saved

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	23	90	155	215	265	307	343	374	400	424
Commercial	23	92	161	231	301	371	441	512	582	652
Industrial	6	25	44	63	81	100	118	137	156	174
Total	**52**	**206**	**360**	**509**	**648**	**778**	**903**	**1,022**	**1,138**	**1,250**

MW Reductions (Passive Resource Summer Impacts)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	3	11	19	26	32	37	42	46	50	54
Commercial (non-Load Response))	3	13	22	31	41	50	59	68	78	87
Industrial (non-Load Response)	1	4	7	9	12	15	18	20	23	26
Total	**7**	**27**	**47**	**66**	**85**	**102**	**119**	**135**	**151**	**167**

MW Reductions (Passive Resource Winter Impacts)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	7	27	46	63	75	85	93	99	104	109
Commercial (non-Load Response))	3	10	18	25	31	36	42	47	52	57
Industrial (non-Load Response)	1	3	5	7	9	11	13	14	16	18
Total	**10**	**40**	**69**	**95**	**115**	**133**	**147**	**160**	**173**	**184**

Table 3-1

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

Connecticut Light and Power

2013-2023

GWh Sales Saved

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	49	219	449	661	792	894	976	1,044	1,101	1,152
Commercial	51	221	444	688	894	1,100	1,306	1,513	1,719	1,925
Industrial	14	60	119	182	236	291	345	400	454	509
Total	**114**	**501**	**1,012**	**1,530**	**1,922**	**2,285**	**2,628**	**2,956**	**3,275**	**3,586**

MW Reductions (Passive Resource Summer Impacts)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	6	25	54	80	95	108	118	127	135	143
Commercial (non-Load Response))	7	30	61	94	122	150	178	206	234	261
Industrial (non-Load Response)	2	8	15	23	30	37	44	50	57	64
Total	**14**	**64**	**130**	**197**	**247**	**294**	**340**	**383**	**426**	**468**

MW Reductions (Passive Resource Winter Impacts)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential	14	63	122	175	212	240	263	282	297	311
Commercial (non-Load Response))	5	23	46	71	92	113	134	155	176	197
Industrial (non-Load Response)	2	8	15	23	30	37	44	50	57	64
Total	**22**	**93**	**182**	**268**	**333**	**390**	**440**	**487**	**530**	**572**

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.

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.
- "Federal Energy Regulatory Commission ("FERC") Order 1000 on Transmission Planning and Cost Allocation was initially issued on July 21, 2011. The order requires changes to transmission planning and cost allocation processes, including: public policy requirements must be considered in regional transmission plans; addresses rights of Federal first refusal (ROFR) to build and own transmission by incumbent utilities; cost allocation must be defined for all project types, and costs can only be allocated if there are benefits; and, inter-regional transmission planning must be coordinated with at least one neighboring region to develop transmission planning and cost allocation for inter-regional projects. Public utility transmission providers and ISOs must prepare and submit compliance filings by the defined due dates. On October 25th, 2012 ISO-NE and New England Transmission Owners ("TOs") jointly made their compliance filing to FERC. On April 11th, 2013 ISO-NE and New England TOs are required to submit their compliance filing on the inter-regional requirements of FERC Order 1000. Currently, the New England TOs, ISO-NE, NY-ISO, and PJM are working together to address the inter-regional requirements of the compliance filing for FERC Order 1000."

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 many scenarios.

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 NERC as the nation's Electric Reliability Organization ("ERO"). The ERO seeks 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. The pre-ERO NERC recognized that the actual planning and construction of new transmission facilities was becoming more complex when in 1997 it's Planning Standards 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.*[6]

On March 15, 2007, the 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 amended the regulations and the pro forma open access transmission tariff adopted in Order 888 and 889 to ensure that transmission services are provided on a basis that is just, reasonable and not unduly discriminatory or preferential. The final rule was designed to: (1) strengthen the pro forma open-access transmission tariff, or OATT to ensure that it achieves its original purpose of remedying undue discrimination: (2) provide greater specificity to reduce opportunities for undue discrimination and facilitate the Commission's enforcement; and (3) increase transparency in the rules applicable to planning and use of the transmission system.

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

4.3 Environmental Regulations and Public Policy

Some existing and proposed EPA rules and regulations will affect generation retirement decisions. While prices in the capacity markets will also influence generation retirement

[6] Planning Standards, North American Electric Reliability Corporation, September 1997

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.

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 2012 IRP 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 (2012 IRP) and CT Comprehensive Energy Strategy

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 Efficiency*, in 2011. The bill merged the Department of Environmental Protection and Department of Public Utility Control into a new state Department of Energy and Environmental Protection. 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 June 2012. This report is the fourth IRP report for Connecticut and the first IRP report developed by DEEP. The report includes a review of the state's 10-year electricity outlook and a comprehensive vision for improving the state's energy future. DEEP also recommends policies that will help make electricity cheaper, cleaner and more reliable, while supporting in-state employment.

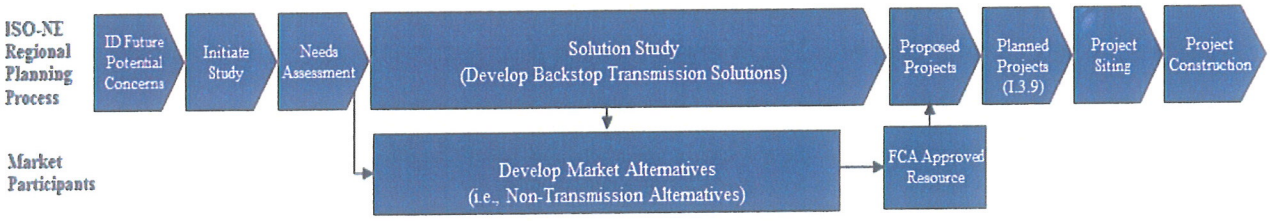
4.4.1 Transmission Planning Process

Within the ISO-NE regional planning process that strives for compliance with NERC and Northeast Power Coordinating Council ("NPCC") planning standards, ISO-NE and 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, potential for environmental impacts, estimated costs, longevity, operational differences, etc. When analysis of the options is complete, the TOs recommend a proposed transmission project to ISO-NE and the Planning Advisory Committee ("PAC"). In parallel, market participants can develop and propose market resource alternatives (non-transmission alternatives NTAs) to resolve the identified needs.

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

Transmission Planning Process Figure



On June 13, 2012, the ISO published a Discussion Paper on Aligning Markets and Planning. This paper is a conceptual design document that explores how to improve consideration of market-based resource alternatives to transmission reliability projects in New England's system planning.

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

1. Southwest Connecticut (SWCT) Needs reassessment study.

2. Greater Hartford/Central Connecticut (GHCC) Needs Assessment study. This study includes a needs assessment of the Greater Hartford area (including Northwest Connecticut, Manchester/Barbour Hill, and Middletown and the Greater Hartford Central Connecticut areas) and a reassessment of the Central Connecticut Reliability Project (CCRP) portion of the NEEWS.

3. Eastern Connecticut Needs assessment study.

4.4.2 Non-Transmission Alternatives to Resolve System Reliability Problems

In the 2012 IRP report, the state of CT reiterated its position to build upon previous IRP decisions to remain active in the creation of a region-wide Non-Transmission Alternatives (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 DEEP in its 2012 IRP report did not propose a Connecticut-specific NTA process; rather, Connecticut plans to support the development of the announced conceptual ISO-NE NTA process dubbed Market Resource Alternative or (MRA). The MRA process announced in 2012 is part of ISO-NE's Strategic Planning Initiative. To that end, ISO-NE presented results of MRA solutions (generation and demand side) that would be required to address the reliability needs of the GHCC study area on two occasions during the fourth quarter of 2012.

4.4.3 2012 IRP 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 the NEEWS projects being planned for transmission reliability purposes, the 2012 IRP 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 earlier implementation of environmental regulation that could contribute to early retirements of some CT generators or the 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.

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 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 from 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 in the east and the Milford Power, Bridgeport Energy and other large units in Southwest Connecticut, 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 more 345-kV loops to/from 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.

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.

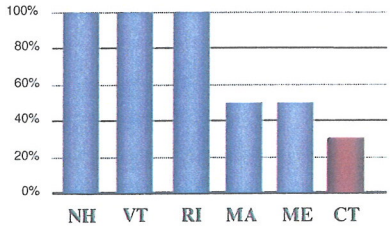
The 115-kV transmission system draws power from these twelve bulk-power substation sources and transmits this power, together with power from smaller central generating stations connected to the 115-kV system and from 115-kV transmission tie lines, to distribution step-down substations which then supply 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 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.

Percentage of Peak Load that Could Be Served by Transmission Imports



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. To this end, CL&P's parent company. Northeast Utilities, is currently developing a transmission project with Hydro-Quebec that would enable imports of up to 1,200 MW of low-carbon power generated in Canada.

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

CL&P divides its service territory into six areas for the purpose of assessing the reliability of its 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 that 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, 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. Also, transmission flows and transmission requirements in Connecticut and New England may ultimately require enhancements to the transmission system beyond those currently being considered.

Included for 2013 is the 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 2012 ISO-NE RSP project listing and on Northeast Utilities Local System Plan for 2012 located at www.transmission-nu.com/business/ferc890 postings.asp.

4.6.1 Southwest Connecticut Area

The SWCT area 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.

The Southwest Connecticut 345-kV loop was completed in 2008. The Southwest Connecticut 345-kV loop consisted of the Bethel-Norwalk, Middletown-Norwalk, Glenbrook Cables, and Long Island Replacement Projects. This group of projects reinforced the transmission system that supplied the southwest Connecticut and Norwalk-Stamford transmission sub-areas. The studies that supported the Middletown-Norwalk Project identified elevated loadings and depressed voltages but these conditions were local in nature and did not violate any reliability criteria. The Southwest Connecticut Working Group ("SWCT WG") consisting of members from ISO-NE, NU, and UI, is in the process of finalizing a Needs Assessment of the southwest Connecticut and Norwalk-Stamford sub-areas. The Needs Assessment is focused on the 2022 system and the local area issues that have become reliability issues as a result of the 13 years of load growth, generator additions, inter-Area transfer increases, and various topology changes.

The Stamford Reliability Cable Project is a product of the SWCT WG Needs Assessment. This Project extends the benefits that the 345-kV loop introduced into the Norwalk-Stamford sub-area. This Project eliminates several thermal and voltage criteria violations that are local in nature the Greenwich-Stamford region of the Norwalk-Stamford sub-area. Concerns regarding load growth in the Stamford-Greenwich region may also necessitate additional transmission reinforcements. The SWCT WG will be developing additional system improvements to address local area criteria violations identified in the on-going Needs Assessment.

Figure 4-2: Geographic Map of SWCT

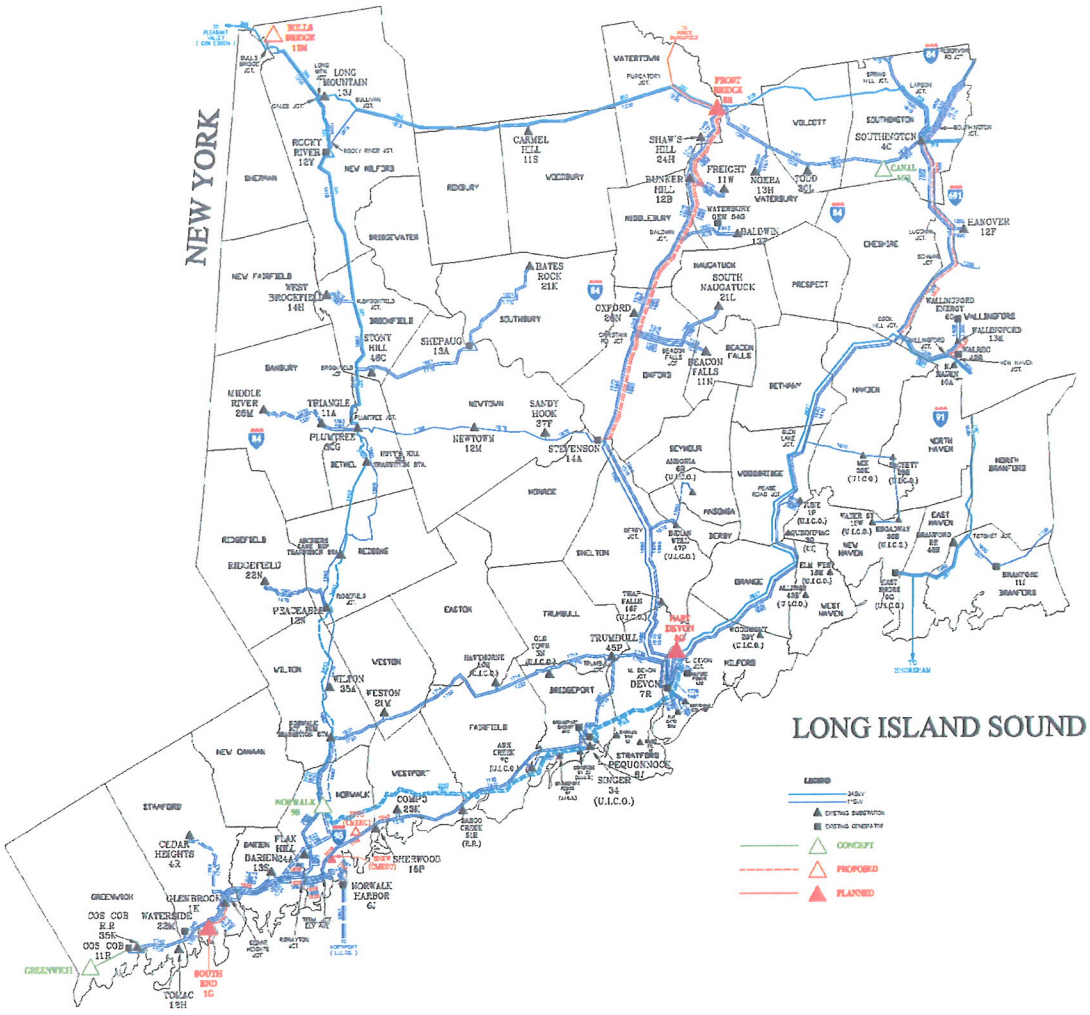


Table 4-1A: Proposed Transmission Line Projects

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 & reconductor	Proposed
Glenbrook	Stamford	South End	Stamford	115	2014	1.5	Underground Cable	Planned
Wallingford	Wallingford	WALREC	Wallingford	115	2015	0.2	Reconductor/ Rebuild	Proposed
Southington	Southington	Cook Hill Jct.	Cheshire	115	2015	10.6	Reconductor	Proposed
Cos Cob	Greenwich	Greenwich	Greenwich	115	2017	TBD	New	Concept

Table 4-1B: Proposed Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
SNEW (CMEEC)	Norwalk	115	2013	Associated substation and line work for CMEEC SNEW substation	Planned
Fitch St. (CMEEC)	Norwalk	115	2013	Associated line work for CMEEC Fitch St. substation	Planned
South End	Stamford	115/13.2	2014	Add a distribution transformer	Planned
Norwalk	Norwalk	115/13.2	2014	Add a distribution transformer	Concept
East Devon	Devon	345	2014	Add a series breaker	Planned
Bulls Bridge	New Milford	115/27.6/23	2015	Replace transformer	Proposed
Canal	Southington	115/23	2016	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

Table 4-1A above lists four proposed transmission line projects in addition to the Glenbrook – South End underground 115-kV line. First is a structure/reconductor replacement project from Frost Bridge Substation to Stevenson Substation. Also, shown are two 115-kV line reconductoring projects in the Southington and Devon corridor. Table 4-1B contains a list of substations that will require future transmission upgrades to integrate new facilities into SWCT's regional grid. At the South End, Norwalk, Canal, Bulls Bridge, and East Devon substations the projected reinforcement plans include the installation of additional distribution transformation capability and/or associated substation equipment to improve reliability in the area. Greenwich will be a new substation needed for reliability and load growth in the Stamford-Greenwich area. Associated new transmission will be needed to connect the new Greenwich Substation.

The SWCT WG presented the needs 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 PAC. The needs included the addition of a third source into the Stamford area from Glenbrook Substation. Also included were solutions being considered for the transmission corridors between Frost Bridge Substation and Devon Substation and between Frost Bridge Substation and Plumtree Substation. An update to PAC followed in June of 2012. In January of 2013, a complete SWCT area needs reassessment scope of work was presented to the ISO-NE PAC. CL&P is currently working with United Illuminating and ISO-NE to determine if there are additional needs due to the FERC mandated "Bright Line" definition.

4.6.2 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 is being included in the GHCC assessment to determine required transmission upgrades.

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

Table 4-2A: Proposed Transmission Line Projects

NONE

Table 4-2B: Proposed Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Scitico	Enfield	115	2014	Substation work associated with new West Hampden Project (NGRID)	Planned

Table 4-2A has no changes and is currently under reevaluation as part of the Greater Hartford Central Connecticut Project. Table 4-2B has one entry which involves substation work at Scitico Substation in Enfield as part of National Grid's new Hampden substation interconnection located in Hampden, Massachusetts.

.4.6.3 Eastern Connecticut Area

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

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

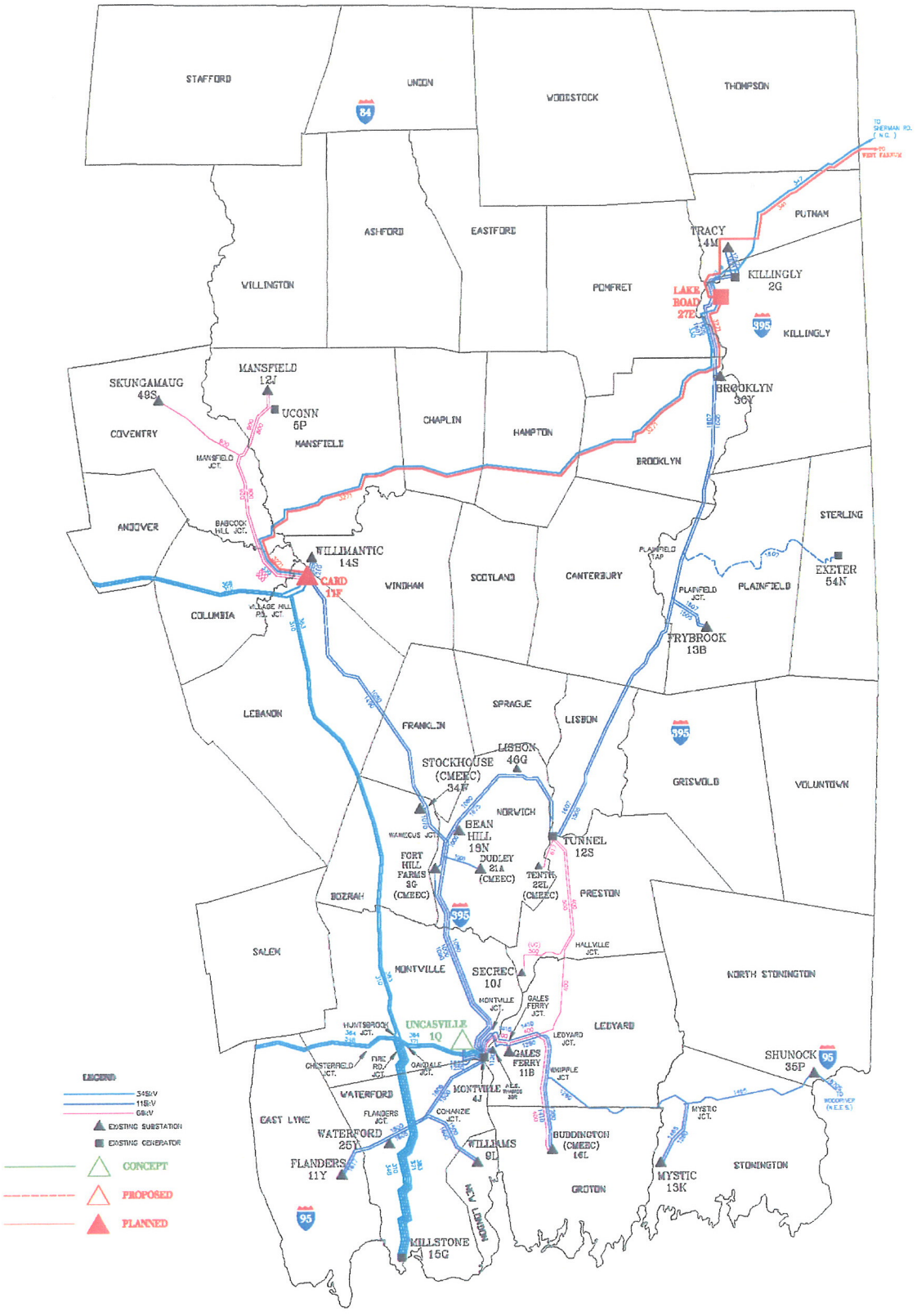


Table 4-3A: Proposed Transmission Line Projects

From Station	City or Town	To Station	City or Town	Voltage kV	ISD	Miles	Project Description	ISO-NE RSP and or LSP
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

Table 4-3B: Proposed Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Card	Lebanon	345	2015	NEEWS - Interstate	Planned
Lake Road	Killingly	345	2015	NEEWS - Interstate	Planned
Uncasville	Montville	115/13.2	2016	Replace both transformers with larger capacity transformers	Concept

Table 4-3A contains two entries both associated with the Interstate Reliability Project, one of the NEEWS Projects. Table 4-3B lists a 345-kV station modifications planned at Card Substation and the Lake Road Switching Station under the Interstate Reliability NEEWS Project. On January 2, 2013, the CSC issued a Decision & Order, approving the Connecticut portion of the Interstate Reliability Project. The last entry is a proposed upgrade at the Uncasville Substation.

In October, 2012, an Eastern area needs assessment scope of work was presented to PAC. The results of the needs assessments may result in additional required transmission upgrades.

4.6.4 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.

Figure 4-5: Geographic Map of the Middletown Area

Table 4-4A: Proposed Transmission Line Projects

NONE

Table 4-4B: Proposed Substation Projects

Substation	City or Town	Voltage kV	ISD	Project Description	ISO-NE RSP and or LSP Status
Beseck	Wallingford	115	2013	Add a Variable Shunt Reactor	Under Construction
Beseck	Wallingford	115	2017	Add a second Variable Shunt Reactor	Planned
Haddam Neck	Haddam	345	TBD	Add a Variable Shunt Reactor	Concept

Table 4-4A has no changes and is currently under reevaluation as part of the Greater Hartford Central Connecticut Project. Table 4-4B contains three entries. The first two entries were identified to ensure there were no adverse impacts due to the NEEWS projects. The last entry is needed due to a reliability issue at light load levels.

4.6.5 Greater Hartford Area

The Greater Hartford Area shown in Figure 4-6 includes the towns in the vicinity of the Capitol city and stretches north to the Massachusetts border, west to the Farmington River, and south to the Route 691 interchange with the Berlin Turnpike. It straddles the Connecticut River in the heart of central Connecticut.

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

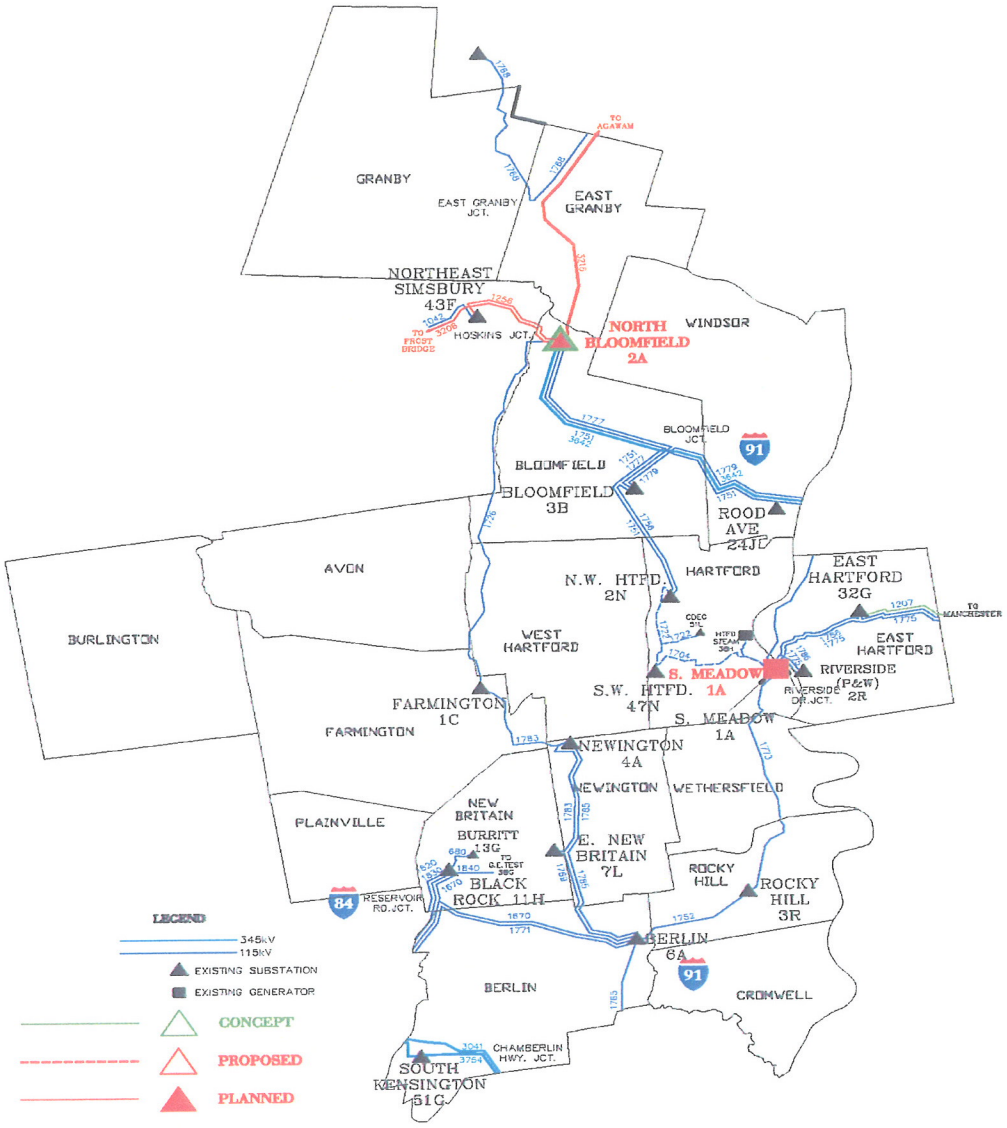


Table 4-5A: Proposed Transmission Line Projects

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	Northeast Simsbury	Simsbury	115	2013	2.4	Reconductor	Planned
Manchester	Manchester	East Hartford	East Hartford	115	TBD	3.2	New transmission line	Concept

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
North Bloomfield	Bloomfield	115	2013	Replace series reactor	Under Construction
South Meadow	Hartford	115	2013	Upgrade to Bulk Power System requirements	Under Construction
North Bloomfield	Bloomfield	115/23	2017	Add a distribution transformer	Concept
North Bloomfield	Bloomfield	345	2017	NEEWS – CCRP	Planned

Table 4-5A contains three entries. The first entry is a new 345-kV transmission line associated with NEEWS Greater Springfield Reliability Project connecting the North Bloomfield Substation to a new 345-kV switchyard in Agawam, Massachusetts. The second entry is a reconductoring of a 115-kV transmission line between North Bloomfield Substation to the Northeast Simsbury Substation in Simsbury which was approved in Petition 1057 by the CSC on February 7, 2013. The third entry is a future transmission line being studied in the Greater Hartford Area.

Table 4-5B includes 345-kV additions and modifications at the North Bloomfield Substation under the NEEWS Greater Springfield Reliability Project. Also under construction at North Bloomfield Substation is a replacement of a 115-kV series reactor in the line to Northeast Simsbury Substation. The third entry in Table 4-5B is a Bulk Power System upgrade required at the South Meadow Substation in Hartford. The next entry is a power-transformer addition at North Bloomfield needed for load growth. The last entry would involve an expansion of the 345-

kV switchyard at North Bloomfield Substation as part of the Central Connecticut Reliability Project. A needs reassessment for the Central Connecticut Reliability Project component of NEEWS is now part of the Greater Hartford - Central Connecticut study.

4.6.6 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

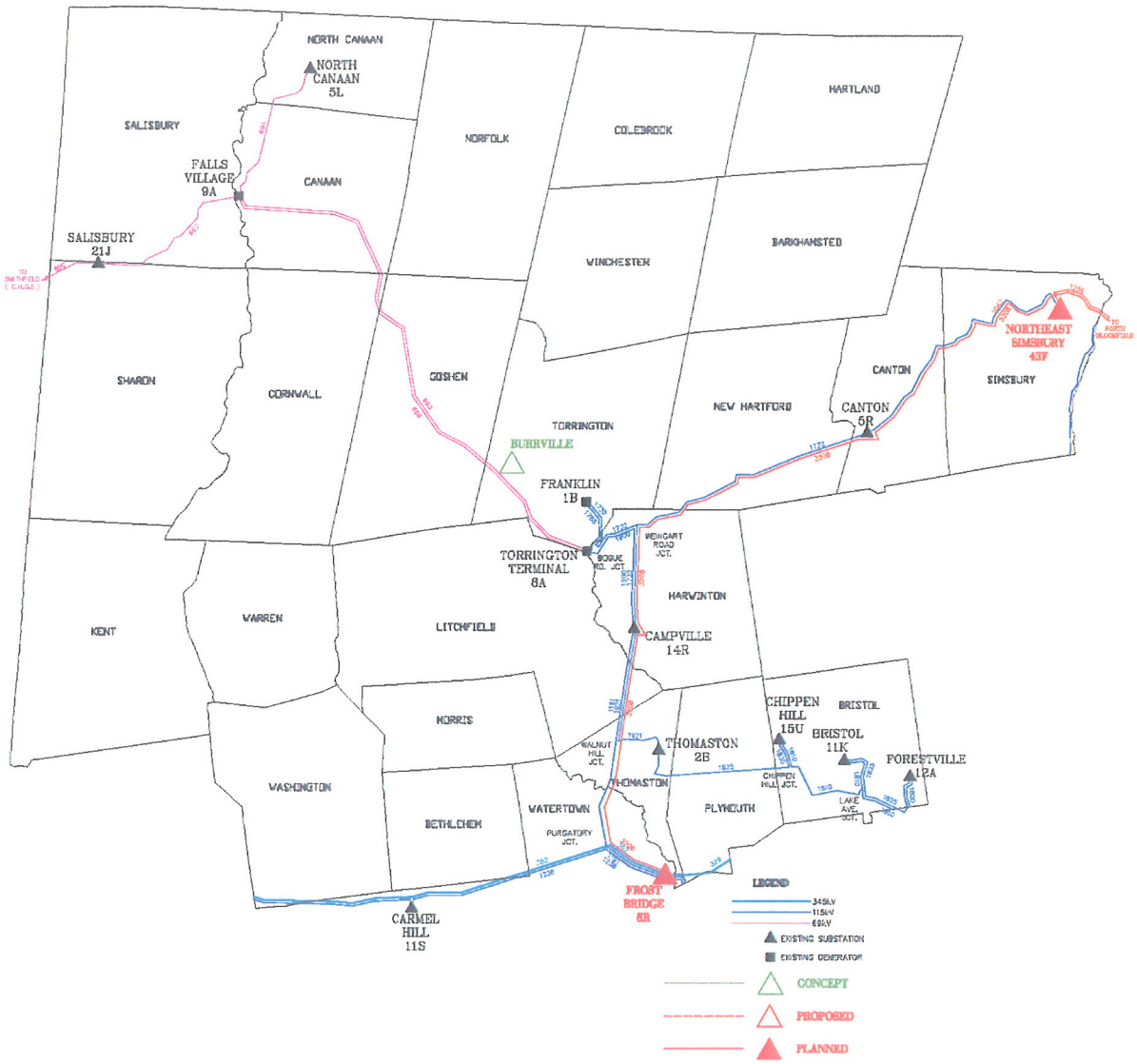


Table 4-6A: Proposed Transmission Line Projects

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	Circuit Breaker Addition	Planned
Burrville	Torrington	115	TBD	New Substation	Concept

Table 4-6A has one entry for a transmission line project associated with NEEWS. This project includes a new 345-kV line between the North Bloomfield Substation, in Bloomfield and the Frost Bridge Substation, in Watertown. The needs reassessment for the Central Connecticut Reliability Project components of NEEWS has been combined with the Greater Hartford and Middletown and Manchester-Barbour Hill studies to become the Greater Hartford - Central Connecticut study and is in its 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 and a new Burrville Substation needed for reliability and load growth.

4.7 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 hydroelectric 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 interconnections 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 has proposed a high-voltage direct current transmission tie line with Hydro Quebec (Northern Pass Transmission Project "NPT") that would provide New England access to competitively priced non-carbon emitting hydroelectric power.

The NPT project 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 is underway.

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 4-7: Map of Potential Renewable Resources