Connecticut Siting Council Review of the Ten-Year Forecast of Connecticut Electric Loads and Resources

Draft Report

INTRODUCTION

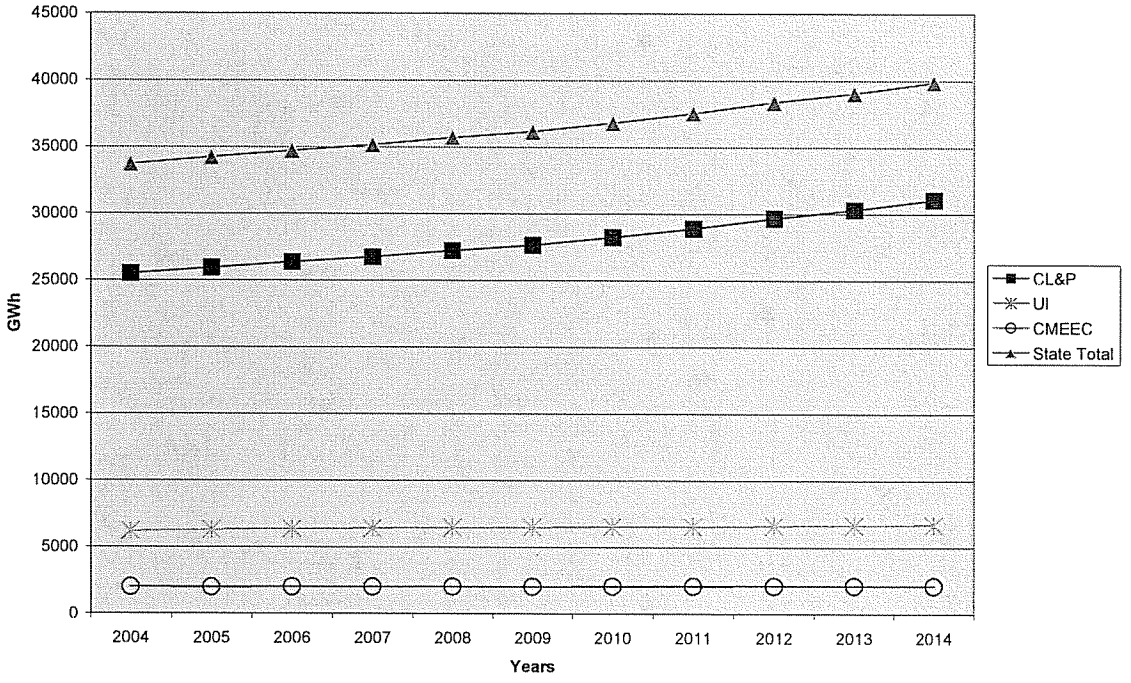
The Connecticut Siting Council (Council) has the legislative charge to annually review the forecasts of electric loads and resources in the State of Connecticut pursuant to Connecticut General Statutes (CGS) § 16-50r. This review includes a holding a public hearing and issuance of a report assessing the overall status of electric loads and resources in the state.

Pursuant to such statutory provisions, every person engaged in generating electricity with a capacity of one megawatt or greater, or transmitting or distributing electricity, shall file a report to the Council by March 1 of each year and this report shall include, as applicable: (1) A tabulation of estimated peak loads, resources and margins for each year; (2) data on energy use and peak loads for the five preceding calendar years; (3) a list of existing generating facilities in service; (4) a list of scheduled generating facilities for which property has been acquired, for which certificates have been issued and for which certificate applications have been filed; (5) a list of planned generating units at plant locations for which property has been acquired, or at plant locations not yet acquired, that will be needed to provide estimated additional electrical requirements, and the location of such facilities; (6) a list of planned transmission lines on which proposed route reviews are being undertaken or for which certificate applications have already been filed; (7) a description of the steps taken to upgrade existing facilities and to eliminate overhead transmission and distribution lines in accordance with the regulations and standards described in section 16-50t; and (8) for each private power producer having a facility generating more than one megawatt and from whom the person furnishing the report has purchased electricity during the proceeding calendar year, a statement including the name, location, size and type of generating facility, the fuel consumed by the facility and the by-product of the consumption.

ENERGY AND LOAD FORECAST

The state's electric transmission/distribution utilities, The Connecticut Light and Power Company (CL&P), The United Illuminating Company (UI), and the Connecticut Municipal Electric Energy Cooperative (CMEEC) predict annual load growth throughout the forecast period. The total energy output requirements for the state are projected to grow from 34,228 gigawatt-hours (GWh) in 2005 to 39,846 GWh in 2014. This results in a (weighted) average annual growth rate of 1.6 percent. CL&P projects an average annual rate of growth of 2.0 percent throughout the forecast period. CMEEC projects a 0.65 percent average annual growth rate, and UI projects a 0.61 percent average annual growth rate. The forecast of the state's electrical energy requirements is depicted in Figure 1.

Figure 1: Connecticut Electric Utilities' Projected System Requirements



Historically, the demand for electricity has been a function of economic growth, as well as weather conditions. However, Connecticut's increased electricity consumption is largely attributable to growth in real estate, including new and larger homes, an active economy, and growing use of electro-technologies such as appliances, computers, and especially air conditioning.

Peak Loads

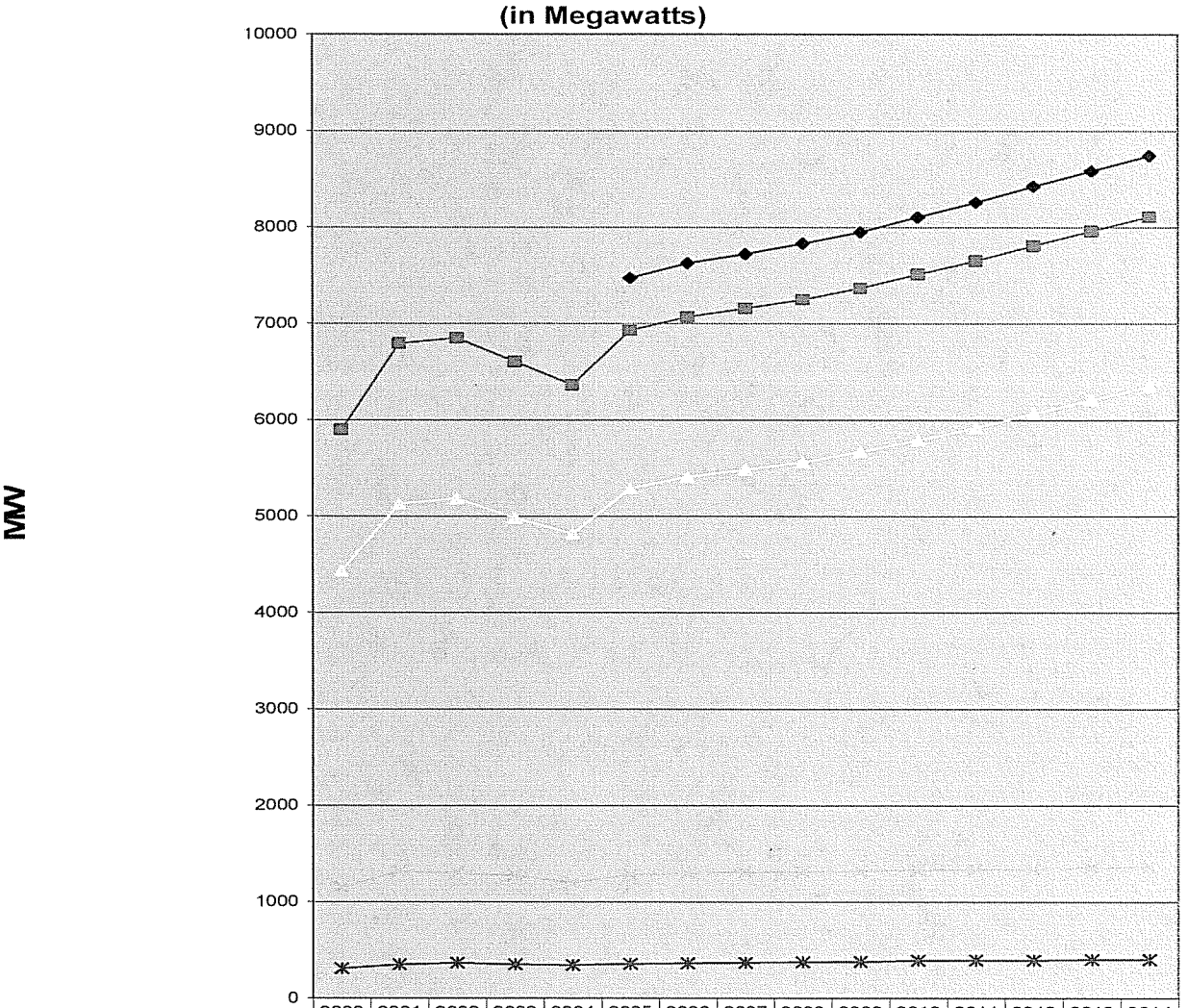
In the year 2004, the non-coincident summer peak load was 6,364 megawatts (MW), which is a 7.1 percent decrease from the previous high in 2002 of 6,851 MW and a 3.6 percent decrease from the year 2003 peak load of 6,604 MW. Non-coincident means that the peaks for the three utilities may not necessarily occur on the same day of the year, but nevertheless are combined in this analysis and the results would not be materially different. Figure 2 depicts the projected loads over the forecast period.

According to the state's utilities projection, the total peak load will grow from 6,364 MW in 2004 to 8,108 MW by year 2014. ISO-New England (ISO-NE) predicts that the total peak load will grow from 6,444 MW in 2004 to 8,305 MW in 2014. Both the CL&P and ISO-NE peak load data in this analysis are based on a 50/50 scenario, which means that the peak load has a 50% chance of being exceeded in a given year. In the 90/10 scenario (i.e. the peak load has only a 10 percent chance of being exceeded), ISO-NE predicts that the summer peak load will grow from 7,580 MW in 2005 to 8,835 MW in 2014. ISO-NE's forecast is generally based on a percentage of demand for the New England region. As such, this may not necessarily include subtle nuances in local utility forecasting.

The historical data in Figure 2 are based on actual peak loads in Connecticut and represent the sum of the peak loads of CL&P, UI, and CMEEC. The projected (future) data are weather-normalized. This means that the data are based on average historical weather conditions over an approximately 30-year time period. For example, CL&P's forecast model assumes a mean daily temperature of 83 degrees Farenheit (F) for a summer peak day based on average peak temperatures from 1972-2001. For the extreme weather scenario, CL&P's projected loads are based on a peak day mean daily temperature of 88 degrees F. CL&P's extreme weather forecast is approximately a 99/1 scenario, i.e. the forecast peak would have less than a one percent chance of being exceeded. However, this is based on the same economic and other non-weather assumptions as the normal weather 50/50 scenario.

Forecasting is used to identify the risk associated between the supply and demand for electricity. However, such projected demand can be affected by weather, economic conditions, as well as customer usage patterns and conservation. The supply of electricity can be affected by fuel prices and availability, private entities' interest in constructing new generation, operating condition of older generating plants, availability of generating plants due to scheduled maintenance shutdowns, and the ability to generate in transmission constrained areas.

Figure 2: State and Utility Peak Demand by Year



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CT Peak Extreme Weather						7471	7624	7722	7829	7949	8105	8256	8425	8583	8741
CT Peak	5896	6795	6851	6604	6364	6929	7068	7157	7250	7368	7510	7652	7806	7962	8108
CL&P Peak	4433	5126	5183	4980	4818	5288	5407	5481	5562	5667	5787	5919	6064	6209	6344
UI Peak	1153	1318	1300	1274	1201	1284	1297	1305	1313	1321	1329	1337	1345	1353	1362
CMEEC Peak	310	351	368	350	345	357	364	371	375	380	394	396	397	400	402

Megawatts

Conservation and Load Management

In 1998, the Connecticut Legislature created the Energy Conservation and Management Board (ECMB) to guide the state's electric distribution companies in the development and implementation of cost-effective energy conservation programs and market transformation initiatives pursuant to Connecticut General Statutes § 16-245m. This legislation also created the Connecticut Conservation and Load Management (C&LM) Fund. The C&LM Fund supports energy efficiency, increased productivity, and helps to

reduce the peak electric demand in the state, especially in southwest Connecticut. (Currently, the C&LM Fund is applicable to publicly-traded electric distribution companies, and as such, does not include the municipal electric utilities in CMEEC's service area.)

In 2004, CL&P and UI customers contributed $72,892,662 to the C&LM Fund via a surcharge on their electric bills. The energy savings resulting from C&LM programs in 2004 was 291 GWh. According to the ECMB's annual report to the legislature, this equates into an annual savings of $32 million, assuming an average price of $0.11 per kWh. This is roughly equivalent to the electric consumption of 37,000 homes in one year.

C&LM also reduces air pollution by reducing demand for electric generation. The ECMB estimates that carbon dioxide emissions were reduced by approximately 180,290 tons in 2004 due to reduced electrical consumption resulting from C&LM. Carbon dioxide is believed to be a "greenhouse gas" associated with global warming.

The C&LM Fund is projected to reduce the peak summer demand by approximately 447 MW in 2005 and 324 MW in 2014 in CL&P's service area. This is equivalent to a moderately-sized power plant. However, despite new investment, the total peak load reduction is expected to drop annually over the (2005-2014) forecast period due to the previously existing C&LM measures reaching the end of their useful lives.

RESOURCE FORECAST

Supply Resources

It is anticipated that the state's supply resources will be adequate to meet demand during the forecast period, provided that all active generators committed to ISO-NE remain available for continuing use and the approved natural gas-fired generating facilities are constructed. However, some subregions such as southwest Connecticut (and to a lesser extent eastern Connecticut) are threatened with supply deficiencies and voltage instability problems due to insufficient transmission and inadequate resources within the region. To address these deficiencies, two large transmission projects, Docket No. 217 Bethel – Norwalk 345-kV line and Docket 272 Middletown – Norwalk 345-kV line as well as a 345-kV/115-kV substation project in the Killingly/Putnam have undergone extensive review by the Council and have been approved.

Insofar as existing generation resources are concerned, the state's electric generating and transmission/distribution companies would institute the following plan to avoid capacity deficiencies in the event Millstone nuclear units or other large base load units go offline:

- operate all available generating units to their reasonable limits;
- maximize the import of electricity from adjacent states;
- arrange to temporarily shift load on high load days to substations and transmission facilities outside of the state;

- explore possible interruption of service with certain industrial and commercial customers;
- maximize the use of customer-owned generators; and
- implement public awareness efforts for conservation and load shifting, including voluntary reductions and/or shifting consumption to off-peak hours.

Although response mechanisms have been helpful in the past, it is vitally important for resources to be strategically located on the grid to ensure supply can technically and economically serve demand. Some generating plants called upon to generate at their maximum capacity in the past may not be able to do so because of age, transmission constraints, fuel availability (such as natural gas during periods of extreme demand), or environmental constraints such as air emission limitations.

The newest generating facility in Connecticut is the Milford Power facility which was activated in 2004. This facility is natural gas-fired and has a summer power output of approximately 492 MW. In 2001, a five-unit natural gas-fired facility in Wallingford was activated. That generating plant has a summer power output of approximately 173 MW. In 2002, the Lake Road Power Station in Killingly was activated. That facility is also natural gas-fired and has a summer power output of approximately 693 MW. With all planned supply resources in place, Connecticut is expected to have a sufficient margin to meet summer peak demand in the near term. However, this scenario is speculative and subject to a number of variables, conditions, and expectations that are subject to change.

Seasonal Claimed Capability

The electric power outputs for generating plants have both a summer and winter rating, referred to as seasonal claimed capability (SCC). SCC ratings are the maximum dependable load-carrying ability, expressed in megawatts, of a generating unit or units, excluding the capacity required for the power station's own use. SCC ratings are computed per ISO-NE's rule M-20 for installed capacity and correspond to the power generating capacities at 20 degrees F and 90 degrees F for winter and summer ratings, respectively. The SCC for a given generating facility that may be claimed by the New England Power Pool (NEPOOL) must be verified by conducting a claimed capacity audit.

Fossil-fueled plants generally have a higher SCC rating in the winter than the summer. For example, in the case of generators driven by a gas turbine engine, the colder air during the winter generally has a higher density than in the summer. Thus, the engine draws in a greater mass of air at a given time, which transfers more momentum to the turbine, thus producing more torque (or twisting effort) which translates into more power that the generator can produce. In the case of generating plants that boil water to generate steam and spin a turbine, this type of plant also generally experiences higher efficiency in the winter due to the increased difference between the boiler temperature and the ambient air temperature.

Black Start Capability

Black start capability (BSC) is the ability of a generating station to start and commence generation without any outside source of electricity. (For example, a power plant with BSC may have its own on-site diesel generators that can start under battery power and then produce electricity in order to start the main generating units.) ISO-NE audits BSC and determines which plants would require BSC. Certain hydroelectric plants inherently have this capability due to the natural water flow and their design. Currently, existing generating plants that have black start capability include: Stevenson Hydro plant; Rocky River Hydro plant; Tunnel Jet Turbine; South Meadows Jet Turbine; Middletown #10; Montville #10 and #11; Franklin Drive #10; Torrington Terminal #10; Branford #10; and PPL Wallingford. In the event of a major blackout, units without black start capability that have been shut down are dependent on outside grid power to start the units.

Nuclear Power Generation

Nuclear plants use nuclear fission (splitting atoms) to produce heat to generate steam, which then operates the turbines and then spins the generators. Since there is no combustion per se, nuclear plants are essentially a zero-air emissions source of electricity. Air emissions that are commonly emitted from fossil-fueled plants such as carbon dioxide, sulfur dioxide, nitrogen oxides, carbon monoxide, etc. are essentially avoided. Other advantages to nuclear power include domestic fuel supply and reduced dependence on foreign oil. However, issues remain with regard to security, nuclear waste storage (both short and long term), safety, and cost.

Connecticut currently has two operational nuclear electric generating units (Millstone 2 and 3) contributing a total of 2,037 MW of summer capacity, approximately 27.3 percent of the state's generating capacity. (The Millstone facility is the largest generating facility in Connecticut, by power output.) Previously, nuclear power supplied approximately 45 percent of Connecticut's electricity. However, this capacity has been reduced by the retirement of the Connecticut Yankee plant in Haddam Neck in December 1996 and Millstone Unit 1 in July 1998.

Nevertheless, Dominion Nuclear Connecticut Inc. (Dominion), the owner of the Millstone nuclear power facility, has increased the power outputs of Units 2 and 3 via an upgrade to the low pressure turbine rotors. These upgrades increased the nominal design electric rating for Unit 2 from 870 MW to 883.5 MW and from 1153.6 MW to 1156.5 MW for Unit 3. These increases provide a total increase of 16.4 MW without increasing fuel consumption or changing core reactor power.

Dominion submitted its license renewal applications to the Nuclear Regulatory Commission (NRC) on January 22, 2004. The NRC is currently reviewing the applications, and has issued a draft Environmental Impact Statement and a draft Safety Evaluation Report. It is anticipated that the NRC will complete its review in 2006. Renewed operating licenses would permit Unit 2 and Unit 3 to operate until 2035 and 2045, respectively.

Coal Power Generation

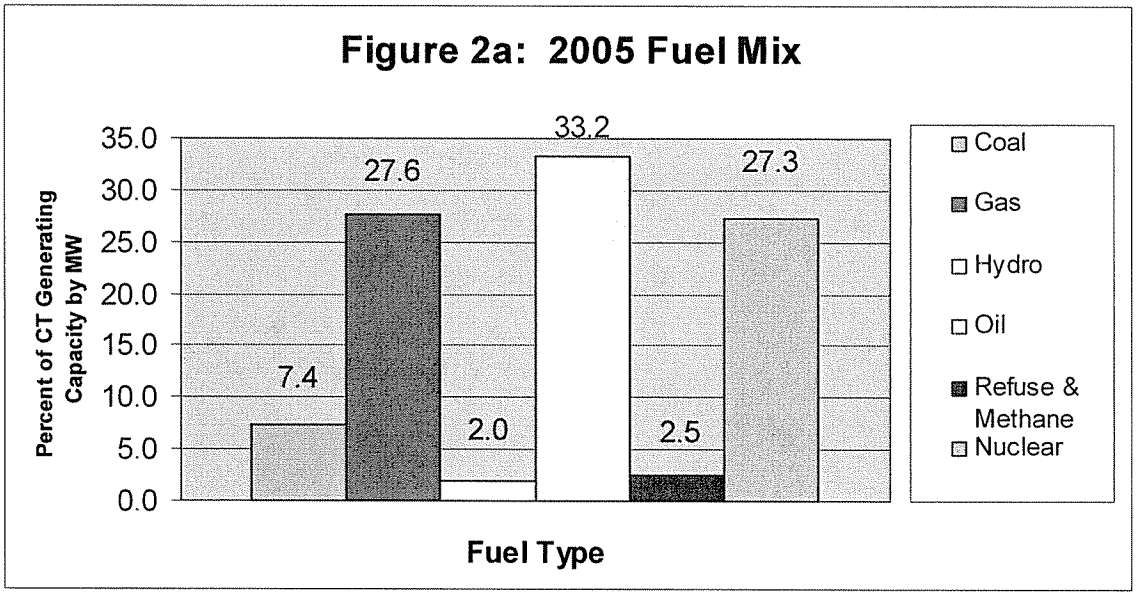
Connecticut currently has two coal-fired electric generating facilities contributing 553 MW, or approximately 7.4 percent of the state's current capacity. The AES Thames facility is located in Montville and generates approximately 181 MW consuming domestic coal. The Bridgeport Harbor #3 facility with a power output of approximately 372 MW is located in Bridgeport and burns imported coal. Using coal as a fuel has the advantage of an abundant domestic supply (with reserves in the United States projected in excess of 250 years) and an existing rail infrastructure to transport the coal. However, concerns exist over air emissions including carbon dioxide, as well as sulfur dioxide and mercury.

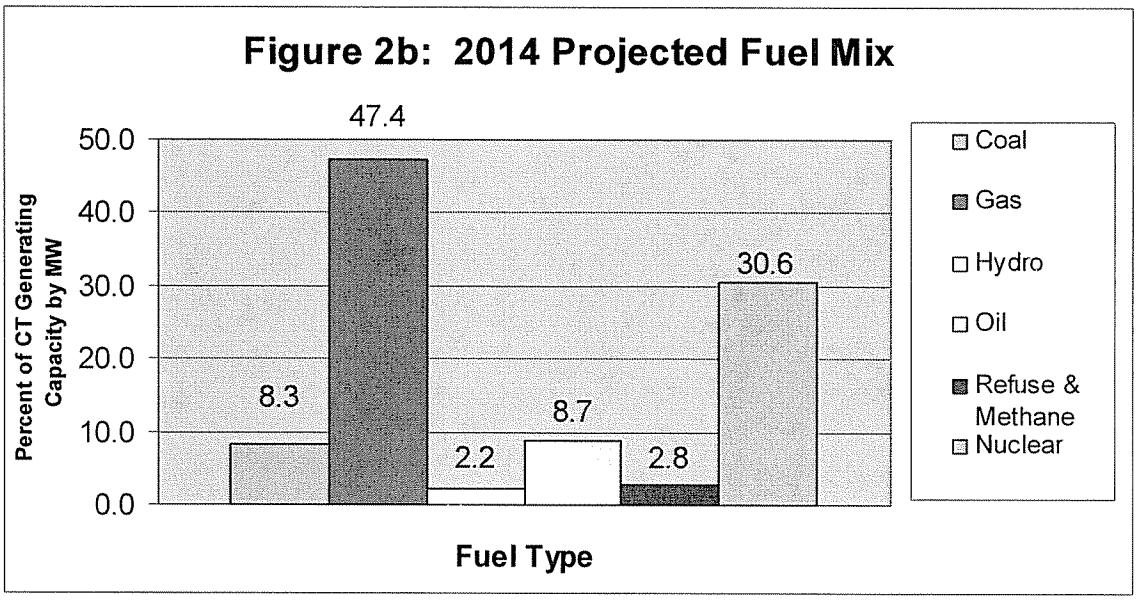
Petroleum Power Generation

Connecticut currently has 25 oil-fired electric generating facilities contributing a total of 2,477 MW, or 33.2 percent of the state's current capacity. This takes into account the deactivation of Devon 8 and Devon 7 in Milford, which resulted in a total loss of approximately 212 MW of generation. Devon 8, which had a summer SCC rating of approximately 107 MW, was deactivated on June 7, 2004. Devon 7, which had a summer SCC rating of approximately 105 MW, was deactivated on October 1, 2004. Both Devon 7 and 8 are now considered deactivated reserve. Furthermore, because the industry generally rates the service life of oil-fired units to be 40 years, some additional units may face retirement during the forecast period. This could further reduce the already tight generation capacity in Connecticut unless replaced by a sufficient number of new natural gas-fired units. Figures 2a and 2b depict the existing and projected generation fuel mix for Connecticut, assuming the effects of possible retirement of oil-fired generating units at least 40 years of age or older.

Furthermore, new oil-fired generation is not expected in the near future due to market volatility and mounting oil prices. In particular, the price of crude oil has recently exceeded $60 per barrel this year. With approximately 60% of the nation's oil being imported, the petroleum supply and prices are highly vulnerable to disruptions and instabilities in supplying countries.

Some of the oil-fired generating facilities in Connecticut are dual-fueled, meaning that they can switch to natural gas if necessary. The Council believes that dual-fuel capability is an important part of diversifying our electric generation and reducing our overdependence on a given fuel. Nevertheless, oil-fired generation is subject to environmental constraints, particularly related to the sulfur content of the oil, as well as possibly tighter air emissions standards in the near term, which may include restrictions on carbon dioxide emissions.





Natural Gas Generation

Connecticut currently has 17 natural gas-fired generating units contributing a total of 2,062 MW, or 27.6 percent, of the state's generating capacity. This includes recent additions such as the Milford Power facility with a total summer seasonal claimed capability (SCC) rating of 492 MW.

Natural gas-fired electric generating facilities are preferred primarily because of higher efficiency, lower initial cost per kW, and cleaner emissions than coal or oil. Natural gas generating facilities also have the advantage of being fueled by a pipeline, rather than requiring regular fuel deliveries like coal or oil.

Some natural gas generating plants, such as Bridgeport Energy, Milford Power and Lake Road, are combined cycle. This means that in addition to the generators driven by the gas turbine engines, the waste heat from the engines is used to generate steam, drive a turbine and generate even more electricity. Thus, a combined cycle plant can generate more MW of electricity for a given amount of fuel than a non-combined cycle plant. This results in a higher overall efficiency. The Council encourages the use of combined cycle technology where feasible due to the increased efficiency and output. However, the tradeoff is the higher initial cost as well as additional space required to accommodate the extra generating unit.

In the event of severely cold weather, the unusually high demand for natural gas for heating can coincide with high demand for natural gas to generate electricity. As such, some generating plants may experience either a forced outage due to pipeline capacity limitations or an "economic curtailment" where it is not economical (from a business perspective) to generate electricity given the higher natural gas fuel costs at that time. During such a situation, some units have the ability to switch to an alternate fuel, such as oil. Connecticut currently has 11 operational natural gas-fired generating plants totaling approximately 1,395 MW that (with dual-fuel capability) have the ability to switch to oil if necessary. In addition, ISO-NE has taken several actions to address issues concerning natural gas generation during unusually cold weather.

Specifically, in ISO-NE's 2004 Regional Transmission Expansion Plan (RTEP04), the report states:

> "...New England's high dependence on gas-fired generation poses a major risk to ensuring adequate generating unit availability during the winter period, as demonstrated by study results and experience during the January 2004 Cold Snap. More than 9,500 MW of capacity, nearly all gas-fired, has been added to the region since 1999. New England now has approximately 11,540 MW of gas-capable capacity (units that use gas as the primary fuel), of which more than 6,730 MW relies solely on gas ('gas only' sources). This leaves the region vulnerable to perturbations in gas supply, including price fluctuations, delivery constraints, and competition from other uses, such as home heating. RTEP04 results show that Boston, Southwest Connecticut, and Central Massachusetts/Northeast Massachusetts are the areas most vulnerable to generation shortages resulting from natural gas fuel supply and delivery interruptions. Recent ISO New England actions will make addition capacity available during the winter and improve the reliability situation."

With regard to the January 2004 Cold Snap, RTEP04 also states:

> "Although New England is a summer peaking system, the winter season presents some risk to the region's reliability. On January 14, 15, 16, 2004, a cold snap resulted in many generating units being out-of-service due to cold weather and unavailability of gas units. This placed the system at greater risk of loss of load, and it was necessary to implement OP 4 on January 14, in order to mitigate a

deficit of approximately 100 MW. To avoid or mitigate such potential capacity shortages in future winter periods, ISO-NE and market participants took the following actions that will result in up to 2,000 MW of capacity beyond that available during the January 2004 Cold Snap:

- Establishment of an Electric/Gas Operations Committee (EGOC) to improve near-term operations planning and coordination of maintenance of both electric and gas pipeline systems in anticipation of cold snap conditions. Communications protocols will be consistent with NEPOOL Information Policy.

- Development of a new Operating Procedure for cold snap periods that trigger:

    1) Elimination or cancellation of "Economic Outages."
    2) Efficient switching to alternative fuels for dual fueled units.
    3) Modification of unit commitment processes to enhance coordination between the electric and gas market nomination timelines."

Hydroelectric Power Generation

Connecticut's hydroelectric generation consists of 28 facilities contributing approximately 149 MW, or 2 percent of the state's current generating capacity. Hydropower has the advantage of being renewable, has zero air emissions, and in some cases has the potential for black start capability. However, environmental concerns exist regarding the effects of dams on river flows, water quality, fish populations, and wildlife habitats. Also, the lack of suitable sites for such facilities poses a significant obstacle to the development of additional hydroelectric generation in Connecticut.

Northeast Generation Company (NGC) received its license renewal order from the Federal Energy Regulatory Commission (FERC) on June 23, 2004, which extended the licensing of the Falls Village, Bulls Bridge, Shepaug, Stevenson, and Rocky River hydroelectric facilities to June 23, 2044. (These five facilities have a combined summer SCC rating of approximately 117 MW). Management plans are used by FERC to fine tune re-licensing orders. NGC is awaiting FERC approval of its Debris, Critical Habitats, and Historic Places Management Plans, as well as other plans.

The Scotland hydroelectric facility's license expires on October 5, 2012. No re-licensing activities are underway for Scotland. The Scotland facility has a summer SCC of 1.69 MW.

Table 1:CT Balance of Supply and Demand for Electricity as of June 2005

Reported in Megawatts (MW)

		status quo generation scenario			less retirement of units scenario		
		2005	**2007**	**2014**	**2005**	**2007**	**2014**
Installed capacity [1,6]		6775	6775	6775	6775	6775	6775
Capacity additions:							
	Meriden [2]			544			544
	Middletown [2]			520			520
	Oxford [2]			512			512
Transmission Import Capability [3]		2200	2200	2200	2200	2200	2200
Cross Sound Cable[4]		-330	-330	-330	-330	-330	-330
Load Shift/OP - 4 Action		562	562	562	562	562	562
Units 40 years of age or greater retired							-1900
Resources to meet Peak Demand	A	**9207**	**9207**	**10783**	**9207**	**9207**	**8883**
Peak Demand – Summer[5]	B	**6929**	**7157**	**8108**	**6929**	**7157**	**8108**
CT Reserves	C = A - B	2278	2050	2675	2278	2050	775
Reserve/Resources *100%[7]	D = C/A	25%	22%	25%	25%	22%	9%

1. Total Summer rating for Connecticut as reported in Appendix A minus the output of the Lake Road generating facility.
   The output of the Lake Road facility was not included in the above analysis due to the fact that it is electrically more a part of Rhode Island than Connecticut.
2. The proposed schedule for commercial operation of these facilities are either postponed or uncertain.
3. The Transmission Import Capability can vary depending on the amount of generation in operation in Connecticut.
4. The Cross Sound Cable has a normal export rating of 330 MW. When the cable is exporting electricity to Long Island, it is considered a load to Connecticut.
5. Projected peak demand as reported by CL&P, UI, and CMEEC forecast filings to the CSC on March 1, 2005.
6. Installed Capacity include Milford Power and excludes Lake Road, as well as Devon 7&8.
7. The Connecticut balance of supply and demand represents an ideal situation. Actual transmission constraints may limit the simultaneous operation of all generation.

Miscellaneous Small Generation

Approximately 108 MW of electricity is generated by 59 independent entities in Connecticut, such as schools, businesses, homes, etc. Their portion of generation is not credited to the state's capability to meet demand because ISO-NE does not control their dispatch. However, these units serve to reduce the net load on the grid, particularly during periods of peak demand. The units range between 10 kW to 32.5 MW in size and are fueled primarily by natural gas, with several others using oil, refuse, hydro, solar, wind, landfill gas (essentially methane), and propane. The installation of additional privately-owned generation is expected, but only at competitive terms or by an entity that views self-generation as a benefit.

Import Capability

As noted in Table 1, Connecticut has the ability to import a total of approximately 2,200 MW of electricity from outside the state without compromising grid voltage and system operating stability. (However, this number is affected by the amount of generation operating in the state and thus, can vary.) Having this import capability is especially important during periods of peak demand or when a large base-load generating facility, such as Millstone is unavailable.

Fuel Cells

A fuel cell consumes hydrogen and oxygen and produces electricity with water as waste product. Fuel cells have the advantages of negligible air emissions, low noise, and reliable operation. In addition to the electricity produced by fuel cells, the waste heat can be used for other purposes to further increase its overall efficiency. For example, it can pre-heat domestic hot water, provide hydronic (hot water) heating or operate an absorption air conditioning system.

Fuel cells generate direct current (DC) electricity by their nature. However, with the use of an inverter, the electrical output can be converted to alternating current so as to be compatible with commercial power. Further, by using a reformer, a fuel cell can be designed to operate on natural gas.

The Council has the legislative charge to review all fuel cell proposals pursuant to CGS §16-50k (a). As such, the Council has reviewed and approved several fuel cells for various uses throughout Connecticut. For example, on April 19, 2005 the Council approved Petition No. 707 for a five kilowatt (kW) fuel cell to be used as a backup generator for a cellular telecommunications facility. Also, on May 11, 2005, the Council approved Petition No. 711 for a 250-kW fuel cell to supply power to meet some of an industrial building's base electric load.

Fuel cells are usually limited in size due to a higher cost per kW than other generation technologies. Nevertheless, fuel cells are well suited for backup generation,

supplemental base-load generation for buildings, and distributed generation. The Council encourages the use of fuel cell technology.

Electric Restructuring

Pursuant to Public Act 98-28, An Act Concerning Electric Restructuring (Act), electric customers of Connecticut's two private investor-owned electric utilities, CL&P and UI are permitted to choose their retail electric suppliers as of January 1, 2000. A municipal electric utility may also engage in competitive generation supply if it reciprocally opens its service territory to other competitive retail suppliers. The law allowed licensed independent retail generation suppliers to compete for customers within the state with the intent that competitive supply would spur an increase in competitive pricing options, potentially decrease the price of electricity, foster technological innovation, and improve environmental quality by promoting new facilities with lower emissions profiles.

Pursuant to the Act, the Department of Public Utility Control (DPUC) established and completed the procedures for unbundling the generation from the transmission and distribution components of electric utility service. The DPUC developed individual line-item charges for non-bypassable service charges that fund: the energy conservation programs; investments in renewable energy technologies; and the system benefit charge which supports education programs, public policy programs, and provides assistance to utility workers and municipalities that are impacted by electric restructuring. While the market-based provisions of the Act have already been executed including the divestiture of non-nuclear and nuclear generation and the initiation of consumer choice of electric generation supply, continued monitoring of the electric supply markets is necessary to ensure the development of an open competitive market.

The vast majority of customers eligible are still being served through two utilities' default service arrangement formerly called the Standard Offer, now called the Transitional Standard Offer (TSO), both of which were capped per the legislation. Relatively few customers have chosen an alternative electric supplier. Market conditions and minimal consumer awareness and interest are factors that may affect consumer decisions regarding their choice of electric supplier. The standard offer rate, which was capped at ten percent below 1996 base rates, expired on December 31, 2003. Pursuant to Public Act 03-135 (PA 03-135), the legislature initiated a transitional service rate to be established by the DPUC that eliminates the ten percent reduction, thereby returning to 1996 base rate levels effective from January 1, 2004 through December 31, 2006. The legislature thus provided consumers with a buffer against potential spikes in electric rates due to potential volatility in market pricing.

Renewable Portfolio Standards

Public Act (PA) 03-135 revised the 1998 restructuring law on the Connecticut Renewable Portfolio Standards (RPS) and required retail electric suppliers to ensure that a certain minimum percentage of their electricity comes from renewable energy sources. PA 03-221 defines Class I renewable energy source as the following:

"(A) energy derived from solar power, wind power, a fuel cell, methane gas from landfills, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the river flow, and began operation after the effective date of this section, or a biomass facility, including, but not limited to, a biomass gasification plant that utilizes land clearing debris, tree stumps or other biomass that regenerates or the use of which will not result in a depletion of resources, provided such biomass is cultivated and harvested in a sustainable manner and the average emission rate for such facility is equal to or less than .075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter except that energy derived from a biomass facility with a capacity of less than five hundred kilowatts that began construction before July 1, 2003, may be considered a Class I renewable energy source, provided such biomass is cultivated and harvested in a sustainable manner, or (B) any electrical generation, including distributed generation, generated from a Class I renewable energy source."

Class II renewable energy sources are defined under PA 03-135 as:

"energy derived from a trash-to-energy facility, a biomass facility that began operation before July 1, 1998, provided the average emission rate for such facility is equal to or less than .2 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter, or a run-of-the-river hydropower facility provided such facility has a generating capacity of not more than five megawatts, does not cause an appreciable change in the riverflow, and began operation prior to the effective date of this section."

Figure 3 depicts the required percentages for Class I and Class II renewable energy sources through 2010.

Figure 3		
Renewable	**Portfolio**	**Standards**
Effective Date	***Minimum Class I Percentage***	***Addt'l Percentage of Class I or II***
1/1/2004	1 percent	3 percent
1/1/2005	1.5 percent	3 percent
1/1/2006	2 percent	3 percent
1/1/2007	3.5 percent	3 percent
1/1/2008	5 percent	3 percent
1/1/2009	6 percent	3 percent
1/1/2010	7 percent	3 percent
Source: PA 03-135		

Installed Capacity Market

Independent electric generators, a non-regulated entity, provide the supply of electricity to the grid via the wholesale electricity market in New England. The generators bid into the regional wholesale market which is governed and operated by ISO-NE. However, existing transmission constraints can result in generating capacity not being able to operate in a given region or not being able to deliver electricity to a given region. According to RTEP04, the current Installed Capacity market (ICAP) does not recognize the differences in the value of capacity based on its location. For example, a resource located in a congested area or one with high load growth would receive the same capacity compensation as a resource located in a non-congested zone or one with sufficient capacity. Also, prices in the single ICAP market have a tendency to become unstable around the point at which generation capacity is just sufficient to meet the resource planning criteria of loss-of-load expectation of one day in ten years. This uncertainty and instability in capacity-market prices have further discouraged investment in new and existing capacity.

To address the issues relative to the single ICAP market, FERC has ordered the implementation of a Locational Installed Capacity (Locational ICAP) market, effective on January 1, 2006. Locational ICAP will differentiate the value of resources based on their location. This is intended to improve price stability and encourage investments in new and existing capacity in congested areas.

Facility Siting

Under a restructured electric system, the Council has approved seven natural gas-fired electric generating facilities:

- 520 MW Bridgeport Energy LLC project in Bridgeport became operational in August of 1998.
- 544 MW Milford Power Company, LLC f/k/a/ PDC-El Paso, LLC project in Milford became fully operational in May 2004.
- 544 MW NRG Northeast Generating LLC project in Meriden was approved by the Council on April 27, 1999 and has until April 27, 2006 to complete construction.
- 792 MW Lake Road Generating Company, L.P. project in Killingly became fully operational May 2002.
- 512 MW Towantic Energy LLC project in Oxford was approved by the Council on June 23, 1999 and has an approved extension of time to complete construction by June 26, 2006.
- 250 MW Wallingford PPL project in Wallingford became operational July 2001.
- 520 MW Kleen Energy Systems, LLC project in Middletown was approved by the Council on March 25, 2003 and has until November 21, 2006 to complete construction.

The total nominal capacity of these plants is 3,682 MW. However, currently, only 2,106 MW or 57 percent of the approved capacity is operating in Connecticut. Delays in project development are due to project specific obstacles encountered. In addition, all of the projects listed are experiencing a certain level of uncertainty in the market overseen by ISO-NE as is the natural gas industry in response to the newly created demand by natural gas-fired generation.

As the electric industry has been restructured, pursuant to Public Act 03-140 (PA 03-140), the Connecticut Energy Advisory Board (CEAB) was reconstituted and given the legislative charge to perform a variety of functions related to energy infrastructure planning on a statewide basis. Specifically, CGS § 16a-3(b) reads as follows:

> "The Board shall, (1) prepare an annual report pursuant to section 17 of this act; (2) represent the state in regional energy system planning processes conducted by the regional independent system operator, as defined in section 16-1; (3) encourage representatives from the municipalities that are affected by a proposed project of regional significance to participate in regional energy system planning processes conducted by the regional independent system operator; (4) issue a request-for-proposal in accordance with subsections (b) and (c) of section 19 of this act; (5) evaluate the proposals received pursuant to the request-for-proposal in accordance with subsection (f) of section 19 of this act; (6) participate in a forecast proceeding conducted pursuant to subsection (a) of section 16-50r; and participate in a life-cycle proceeding conducted pursuant to subsection (b) of section 16-50r."

TRANSMISSION SYSTEM

In Connecticut, electric lines with a voltage of 69 kilovolts or more are considered transmission lines. Electric transmission is used to transport large amounts electric power efficiently by utilizing high voltages. (Electric lines below 69-kV are generally referred to as distribution lines.) The state's electric transmission system contains approximately: 1,300 circuit miles of 115-kV transmission; 398 circuit miles of 345-kV transmission; 5.8 miles of 138-kV transmission; and 104 circuit miles of 69-kV transmission. (These mileages refer to alternating current (AC) transmission. As such, the Cross Sound Cable is not included in the above mileages, as it is DC.) Connecticut's electric transmission system is also depicted in the map in Appendix B. Appendix C contains planned new transmission, reconductoring, or upgrading of existing lines to meet load growth and/or generation dispatch conditions.

The CL&P 345-kV transmission system transmits power from large central generating stations such as Millstone, Lake Road, and Middletown #4 via four 345-kV transmission ties with neighboring utilities. This includes one tie with UI, as well as three ties that cross the state line to connect with: National Grid in Rhode Island, WMECO in Massachusetts, and Consolidated Edison in New York state.

The three interstate 345-kV ties are approximately 35 to 40 years old and were designed when loads were considerably smaller than today. Given the present size of the loads and the future projected loads, it is likely that these ties will have to be supplemented in the not too distant future. Nevertheless, the Council notes that new future 345-kV transmission is proposed to connect Card Substation in Lebanon to the Lake Road Substation in Killingly and then continue to West Farnum Road Substation in Rhode Island.

CL&P's remaining AC transmission is rated between 69-kV and 138-kV. The 138-kV transmission line connects southwest Connecticut to Long Island via an underwater cable. In addition, CL&P has 13 ties with CMEEC, twenty with UI, and seven interstate connections. Of the seven interstate connections, one tie is with National Grid in Rhode Island; one is tie is with Central Hudson in New York state; and five are with WMECO in Massachusetts.

As for DC transmission, the Cross Sound Cable is a submarine cable that connects New Haven, Connecticut with Brookhaven, New York. The cable has a 330 MW capacity and is capable of transmitting power in either direction. The Cross Sound Cable was reactivated on June 25, 2004 pursuant to a settlement agreement among: the Long Island Power Authority (LIPA), the Connecticut Department of Environmental Protection, DPUC, CL&P, and the Cross Sound Cable Company, LLC.

Electric Transmission in Southwest Connecticut

The most critical and constrained transmission area in the state, as well as New England, is a 54 town region referred to as Southwest Connecticut (SWCT). (This region includes all of UI's service territory.) This area is essentially west of Interstate 91 and south of Interstate 84 and accounts for approximately one-half the state's peak load and is one of the fastest growing and economically vital areas of the state. This area is primarily served by 115-kV transmission lines which have essentially reached the limit of their ability to reliably and economically support SWCT's current and projected load. Within SWCT is also a critical sub-area called the Norwalk-Stamford Sub-Area. This area has historically been reliant on generation within the area to serve the load. With the change to the deregulated market-based system and given the aging nature of certain local generating plants, it is not longer feasible to rely on generation to meet the long term reliability needs of the area.

To address this deficiency, a study of SWCT was completed in 2002 by ISO-NE, CL&P, and UI. The study identified the need to construct a 345-kV loop to integrate SWCT into New England's 345-kV bulk power transmission grid.

The first phase of this proposed upgrade (known as "Phase One"), involves the construction of a 345-kV transmission line from Plumtree Substation in Bethel to the Norwalk Substation in Norwalk. The Phase One proposal was the subject of Council Docket No. 217. This proposal was approved by the Council on July 14, 2003. Construction is currently underway.

The second phase of the upgrade (known as "Phase Two") was the subject of Council Docket No. 272. This proposal includes the construction of a 345-kV transmission line from Middletown to Norwalk Substation. This project was approved by the Council on April 7, 2005. The project is currently in the Development and Management Plan submission and review phase.

To help address the needs of SWCT in the interim, ISO-NE has issued Request for Proposal (RFP) awards for several temporary emergency generators, as well as a demand response program. According to RTEP 04, without these emergency actions, using a 90/10 forecast scenario, a 130 MW shortfall was predicted in SWCT for 2004 and it would gradually worsen to 270 MW by 2007. As such, the ISO-NE RFP award measures for SWCT are projected to remain in place through approximately 2007.

Pursuant to these RFP awards, Council has reviewed and approved several emergency generators for SWCT. For example, on May 19, 2004, the Council ruled favorably on the proposed installation of four 2 MW diesel generators in Wallingford under Petition No. 672. Also, the Council also ruled favorably on the proposed installation of three 2 MW diesel generators in East Norwalk under Petition No. 676. Figure 4 depicts ISO-NE's Quick Start Capacity schedule for SWCT pursuant to its RFP awards.

Figure 4	**ISO-NE**	**Quick-Start**	**Capacity**	**for SWCT**
Technology	**2004 Summer MW**	**2005 Summer MW**	**2006 Summer MW**	**2007 Summer MW**
On-Peak Conservation	1	4	5	5
Emergency Generation	94	153	154	154
Load Reduction	21	53	74	74
Combined Energy and Load Reduction	3	12	22	27
Total	**119**	**222**	**255**	**260**

Substation and Switchyards

On May 11, 2005, the Council approved the Northeast Connecticut Reliability Project as Docket No. 302. This project includes the construction of a new 345-kV/115-kV substation on CL&P property that straddles the Killingly/Putnam town line. This substation will connect to an existing overhead 345-kV transmission line and then use that source to feed into two existing overhead 115-kV transmission lines. This project is expected to alleviate transmission capacity constraints and improve electric system reliability in this region of the state.

In addition, as depicted in Figure 5, as many as ten new substations are planned for the next four years to address other high load areas within the state. Some of the substations are associated with the 345-kV transmission projects in SWCT. Seven additional substations are being considered with the estimated in-service dates to be determined.

Figure 5: Planned Substation Projects	Est. In-Service Date	Company
Install a new 345-kV Kleen Switching Station in Middletown	TBD[1]	CL&P
Install the new 345-kV South Kensington Switching Station in Berlin	TBD[2]	CL&P
Expand the existing 345-kV Long Mountain Switching Substation in New Milford	2005	CL&P
Expand the existing 115-kV Haddam Substation in Haddam	2005	CL&P
Install a new 345-kV Haddam Substation in Haddam	2005	CL&P
Install the new 115-kV Shunock Substation in North Stonington	2005	CL&P
Expand the existing 345-kV Plumtree Substation in Bethel	2006	CL&P
Install the new 345-kV Norwalk Substation in Norwalk	2006	CL&P
Install a new 345-kV/115-kV Killingly Substation in Killingly	2006	CL&P
Expand the existing 115-kV Triangle Substation in Danbury	2007	CL&P
Expand the existing 138-kV/115-kV Norwalk Harbor Substation In Norwalk	2007	CL&P
Install a new 115-kV Wilton Substation in Wilton	2007	CL&P
Install a new 115-kV Stepstone Substation in Guilford	2007	CL&P
Addition of a circuit breaker at Elmwest Substation in West Haven	2007	UI
Modify the existing 115-kV Norwalk Substation in Norwalk	2008	CL&P
Install a new 345-kV Barbour Hill Substation in South Windsor	2008	CL&P
Expand the existing 115-kV Glenbrook Substation in Stamford	2008	CL&P
Install a new 345-kV/115-kV East Devon Substation in Milford	2009	CL&P
Expand the existing 115-kV Norwalk Substation in Norwalk	2009	CL&P
Modify the existing 115-kV Devon Substation in Milford	2009	CL&P
Install a new 345-kV Beseck Switching Station in Wallingford	2009	CL&P
Expand the existing 345-kV Scovill Rock Switching Station in Middletown	2009	CL&P
Install a new 345-kV Singer Substation in Bridgeport	2009	UI
Addition of a circuit breaker and bus at Pequonnock Substation in Bridgeport	2009	UI
Expand the existing 115-kV Glenbrook Substation in Stamford	TBD	CL&P
Expand the existing 115-kV Norwalk Harbor Substation in Norwalk	TBD	CL&P
Expand the existing 345-kV Card Substation in Lebanon	TBD	CL&P
Install a new 115-kV Jack's Hill Substation in Oxford	TBD	CL&P
Install a new 115-kV Windsor Substation in Windsor	TBD	CL&P
Install a new 115-kV West Southington Substation in Southington	TBD	CL&P
Install a new 115-kV South Cheshire Substation in Cheshire	TBD	CL&P
Install a new 115-kV Goshen Substation in Goshen	TBD	CL&P
Install a new 115-kV Bradley Substation in Middletown	TBD	CL&P
Install a new 115-kV Walnut Hill Substation in the Salem area	TBD	CL&P

1 - The Kleen Switching Station associated with the proposed Kleen Energy Plant has been delayed due to delays in construction of the plant.

2 - The South Kensington 345-kV Switching Station associated with the proposed Meriden Power generating plant has been delayed due to delays in construction of the plant.

Because the development of new transmission as well as substation/switching facilities may be considered undesirable by local communities, utilities must carefully assess supply locations, load center demands, and the need for new or upgraded facilities far in advance of actual construction. These issues must considered along with environmental concerns including electric and magnetic field emissions, aesthetics and the availability of suitable sites.

RESOURCE PLANNING

The Council fully endorses and participates in the assessment of resources, modeling, and planning initiatives to maintain electric reliability. This process includes programs such as C&LM, resource supply, and transmission planning. The complexity and necessary integration of these programs has substantially increased as growing demand has stressed existing resources. In addition, consumer costs, congestion management, targeted demand-side programs, regional transfers, and the difficulty in facility siting has presented issues that have made decision-making difficult and not without consequences.

As depicted in Appendix B, the Council continues to assess existing electric transmission, fuel supply, including natural gas, generation, and demand-side resources as well as planning options to maintain and improve reliability. However, multiple scenarios for demand-side planning, new natural gas pipeline siting, new generation siting, and dispatch of existing generations facilities must be considered before final decisions are made by state regulators and the ISO-NE.

In addition, pursuant to PA 03-140, the CEAB has the legislative charge to issue RFPs to investigate possible alternatives to proposed energy facilities that are the subject of applications to the Council. Possible alternatives may include transmission, electric generation including distributed generation, demand-side changes, as well as other strategies or a combination thereof.

CONCLUSION

This forecast has modeled Connecticut's electric energy future for the next ten years and illustrates that supplies are expected to meet demand. However, this forecast includes assumptions that are subject to change over time including but not limited to the anticipated completion dates of approved generation, and projected retirement dates of older oil-fired generating facilities.

Transmission constraints, particularly in SWCT, reductions in C&LM funding as well as existing savings measures reaching the end of their useful lives, over-reliance on natural gas, and delays in construction of approved generation continue to raise concerns about Connecticut's electric system.

Issues that warrant attention include:

- maintaining sufficient emergency generation and demand response in SWCT until long term transmission upgrades are completed;
- lack of new generation being proposed in Connecticut, as well as delays in approved generation;
- the deactivation/retirement of older generating facilities;
- growing reliance on natural gas as fuel for generation; and
- long term system reliability.

Appendix A
Existing Electric Generation Facilities
as of June, 2005

Facility	Owner	Town	Fuel	Summer Rating	Winter Rating
AES Thames	AES Thames, Inc.	Montville	Coal/Oil	181.00	182.15
Aetna Capitol District	Capitol District Energy Ctr.	Hartford	Gas/Oil	51.69	57.77
Bantam #1	NGC	Litchfield	Hydro	0.07	0.32
Branford #10	NRG	Branford	Oil	15.84	20.95
Bridgeport Energy	Bridgeport Energy LLC	Bridgeport	Gas	451.22	530.46
Bridgeport Harbor #2	PSEG Power, LLC	Bridgeport	Oil	130.50	147.51
Bridgeport Harbor #3	PSEG Power, LLC	Bridgeport	Coal/Oil	372.21	370.37
Bridgeport Harbor #4	PSEG Power, LLC	Bridgeport	Oil	9.92	14.72
Bridgeport Resco	CRRA	Bridgeport	Refuse	58.52	58.74
Bristol RRF	Ogden Martin Systems-CT	Bristol	Refuse/Oil	13.20	12.74
Bulls Bridge #1- #6	NGC	New Milford	Hydro	8.40	8.40
Dexter	Alstom	Windsor Locks	Gas/Oil	38.00	39.00
Colebrook	MDC	Colebrook	Hydro	1.37	1.37
Cos Cob #10	NRG	Greenwich	Oil	17.88	22.78
Cos Cob #11	NRG	Greenwich	Oil	18.24	23.23
Cos Cob #12	NRG	Greenwich	Oil	18.44	23.34
Dayville Pond	Summit Hydro Power	Killingly	Hydro	0.06	0.06
Derby Dam	McCallum Enterprises	Shelton	Hydro	7.05	7.05
Devon #7	NRG	Milford	Oil/Gas	0.00	0.00
Devon #11	NRG	Milford	Gas/Oil	29.58	39.10
Devon #12	NRG	Milford	Gas/Oil	29.24	38.45
Devon #13	NRG	Milford	Gas/Oil	30.76	39.76
Devon #14	NRG	Milford	Gas/Oil	30.80	41.00
Exeter	Oxford Energy, Inc.	Sterling	Tires/Oil	24.17	25.66
Falls Village #1- #3	NGC	Canaan	Hydro	9.76	11.00
Franklin Drive #10	NRG	Torrington	Oil	15.42	20.53
Glen Falls	Summit Hydro Power	Plainfield	Hydro	0.10	0.10
Goodwin Dam	MDC	Hartland	Hydro	2.06	2.06
Hartford Landfill	CRRA	Hartford	Methane	2.53	2.53
Kinneytown A	Kinneytown Hydro Co.	Ansonia	Hydro	0.25	0.25
Kinneytown B	Kinneytown Hydro Co.	Seymour	Hydro	0.65	0.65
Lake Road #1	Lake Road Generating Co., L.P.	Killingly	Gas/Oil	232.14	267.76
Lake Road #2	Lake Road Generating Co., L.P.	Killingly	Gas/Oil	223.36	258.98

Appendix A
Existing Electric Generation Facilities
as of June, 2005

Facility	Owner	Town	Fuel	Summer Rating	Winter Rating
Lake Road #3	Lake Road Generating Co., L.P.	Killingly	Gas/Oil	237.64	273.27
Lisbon RRF	Riley Energy Systems	Lisbon	Refuse	12.96	13.04
Mechanicsville	Saywatt Hydro Associates	Thompson	Hydro	0.10	0.10
Middletown #2	NRG	Middletown	Oil/Gas	117.00	120.00
Middletown #3	NRG	Middletown	Oil/Gas	236.00	245.00
Middletown #4	NRG	Middletown	Oil	400.00	402.00
Middletown #10	NRG	Middletown	Oil	17.12	22.02
Milford Power #1	Milford Power Company, LLC	Milford	Gas/Oil	239.00	267.24
Milford Power #2	Milford Power Company, LLC	Milford	Gas/Oil	253.09	287.63
Millstone #2	Dominion Nuclear CT, Inc.	Waterford	Nuclear	882.14	881.96
Millstone #3	Dominion Nuclear CT, Inc.	Waterford	Nuclear	1155.00	1155.48
Montville #5	NRG	Montville	Oil/Gas	81.00	81.59
Montville #6	NRG	Montville	Oil	407.40	409.91
Montville #10 & #11	NRG	Montville	Oil	5.30	5.35
New Haven Harbor #1	PSEG Power, LLC	New Haven	Oil/Gas	447.89	454.64
New Milford Landfill	Vermont Electric Power Company	New Milford	Methane/Oil	2.44	2.44
Norwalk Harbor #1	NRG	Norwalk	Oil	162.00	164.00
Norwalk Harbor #2	NRG	Norwalk	Oil	168.00	172.00
Norwalk Harbor #10 (3)	NRG	Norwalk	Oil	11.93	17.13
Norwich 2nd St./Greenville Dam	CMEEC	Norwich	Hydro	0.95	0.95
Norwich 10th St.	CMEEC	Norwich	Hydro	0.98	1.21
Norwich Jet	CMEEC	Norwich	Oil	15.26	18.80
Pinchbeck	William Pinchbeck, Inc.	Guilford	Wood	0.01	0.01
PPL Wallingford Unit #1	PPL EnergyPlus, LLC	Wallingford	Gas	43.50	48.95
PPL Wallingford Unit #2	PPL EnergyPlus, LLC	Wallingford	Gas	41.37	52.37
PPL Wallingford Unit #3	PPL EnergyPlus, LLC	Wallingford	Gas	43.53	48.43
PPL Wallingford Unit #4	PPL EnergyPlus, LLC	Wallingford	Gas	44.51	49.79
PPL Wallingford Unit #5	PPL EnergyPlus, LLC	Wallingford	Gas	42.57	53.57
Preston RRF	SCRRF	Preston	Refuse/Oil	16.01	16.95
Putnam	Putnam Hydropower, Inc.	Putnam	Hydro	0.58	0.58
Quinebaug	Quinebaug Associates LLC	Killingly	Hydro	0.98	2.81
Rainbow Dam	Farmington River Power Co.	Windsor	Hydro	8.20	8.20
Robertsville #1- #2	NGC	Colebrook	Hydro	0.32	0.62

Appendix A
Existing Electric Generation Facilities
as of June, 2005

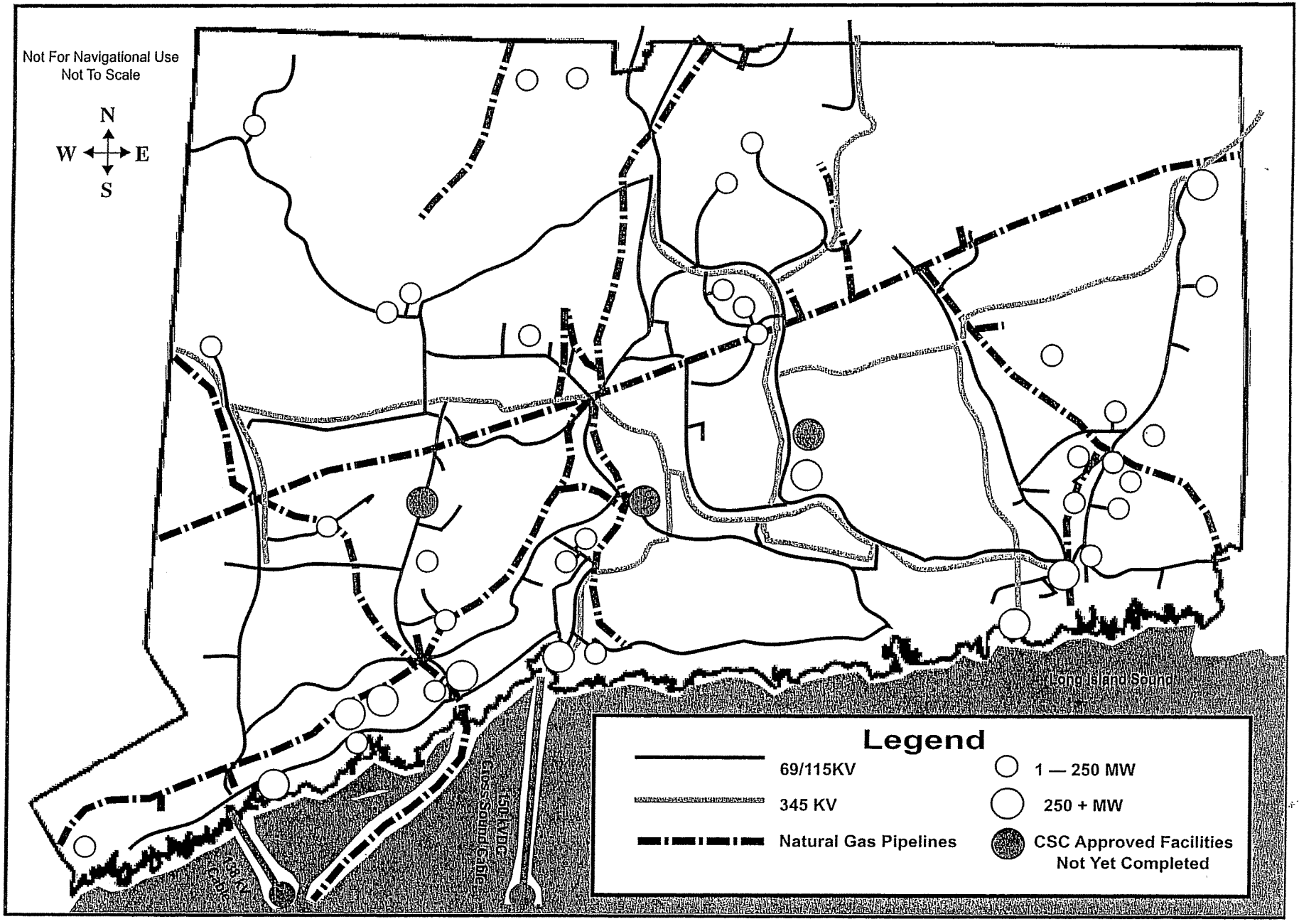
Facility	Owner	Town	Fuel	Summer Rating	Winter Rating
Rocky Glen	Rocky Glen Hydro LP	Newtown	Hydro	0.04	0.04
Rocky River	NGC	New Milford	Hydro-pump strg.	29.35	6.11
Scotland #1	NGC	Windham	Hydro	1.69	2.20
Shepaug #1	NGC	Southbury	Hydro	41.51	42.56
South Meadow #5	CRRA	Hartford	Refuse	25.60	29.23
South Meadow #6	CRRA	Hartford	Refuse	27.11	30.45
South Meadow #11	NGC	Hartford	Oil	35.78	46.92
South Meadow #12	NGC	Hartford	Oil	37.70	47.87
South Meadow #13	NGC	Hartford	Oil	38.32	47.92
South Meadow #14	NGC	Hartford	Oil	37.35	47.35
Stevenson #1- #4	NGC	Monroe	Hydro	28.31	28.90
Taftville #1- #5	NGC	Norwich	Hydro	2.03	2.03
Torrington Terminal #10	NRG	Torrington	Oil	17.12	21.00
Toutant	Toutant Hydro Power, Inc.	Putnam	Hydro	0.16	0.16
Tunnel #1- #2	NGC	Preston	Hydro	1.53	2.10
Tunnel #10	NGC	Preston	Oil	15.89	20.76
Wallingford RRF	CRRA	Wallingford	Refuse/Oil	6.35	6.90
Willimantic #1	Willimantic Power Corp.	Willimantic	Hydro	0.42	0.42
Willimantic #2	Willimantic Power Corp.	Willimantic	Hydro	0.39	0.39
Wyre Wynd	Summit Hydro Power	Griswold	Hydro	1.80	1.80

Seasonal Claimed Capability of coal fired plants	553.21	552.52
Seasonal Claimed Capability of natural gas fired plants	2062.00	2393.53
Seasonal Claimed Capability of oil fired plants	2477.30	2617.33
Seasonal Claimed Capability of hydroelectric plants	149.11	132.44
Seasonal Claimed Capability of methane fired plants	4.97	4.97
Seasonal Claimed Capability of nuclear plants	2037.14	2037.44
Seasonal Claimed Capability of refuse fueled plants (inc. tires)	183.92	193.70
Seasonal Claimed Capability of wood fired plants	0.01	0.01
Total Seasonal Claimed Capability available for dispatch to the electric grid.	7467.66	7931.94

Appendix A
Existing Electric Generation Facilities
as of June, 2005

Facility (self generation)	Owner	Town	Fuel	Summer Rating	Winter Rating
Connecticut Valley Hospital	State of Connecticut	Middletown	Oil	2.05	2.05
Fairfield Hills Hospital	Fairfield Hills Hospital	Newtown	Oil	3.95	3.95
Federal Paper Board	Federal Paper Board	Sprague	Oil	9.00	9.00
Fishers Island Elec. Co.	Fishers Island Elec. Co.	Groton	Oil	1.10	1.10
Groton Sub Base	U.S. Navy	Groton	Oil/Gas	18.50	18.50
Loctite	Loctite	Rocky Hill	Gas	1.18	1.18
Norwalk Hospital	Norwalk Hospital	Norwalk	Gas	2.36	2.36
Norwich State Hospital	Norwich State Hospital	Norwich	Oil	2.00	2.00
Pfizer #1	Pfizer	Groton	Oil	32.50	32.50
Pratt & Whitney	UTC	E. Hartford	Gas	23.80	23.80
Pratt & Whitney	UTC	Middletown	Oil	1.00	1.00
Smurfit-Stone Container Co.	Smurfit-Stone Container Co.	Montville	Refuse	2.00	2.00
Southbury Training School	State of Connecticut	Southbury	Oil	1.50	1.50
	Total Natural Gas Fired Generation less than 1 MW each			4.41	4.41
	Total Propane Fired Generation less than 1 MW each			0.03	0.03
	Total Hydroelectric Generation less than 1 MW each			2.21	2.21
	Total Methane Fueled Generation less than 1 MW each			0.13	0.13
	Total Solar (photovoltaic) Generation less than 1 MW each			0.15	0.15
	Total Wind Powered Generation less than 1 MW each			0.05	0.05
	Generation retained by facility			107.92	107.92
	Total MWs of generation in Connecticut.			7575.58	8039.86

Appendix B
State of Connecticut
Existing Energy Infrastructure
As of January 2004



Appendix C
Planned
Transmission Lines in Connecticut

Planned Transmission Lines in Connecticut	Length (miles)	Voltage (kV)	Expected Date to be In Service
Plumtree S/S, Bethel - Norwalk S/S, Norwalk (new) (Docket No. 217)	8.6	345	2006
Plumtree S/S, Bethel - Norwalk S/S, Norwalk (new) (Docket No. 217)	11.8	345	2006
Plumtree S/S, Bethel - Norwalk S/S, Norwalk (reconfigure 1470/1565 lines) (Docket No. 217)	1.3	115	2006
Plumtree S/S, Bethel - Norwalk S/S, Norwalk (reconfigure 1470/1565 lines) (Docket No. 217)	10.0	115	2006
Norwalk Harbor Station, Norwalk - Northport Station, Northport, NY (replace) (Docket No. 224)	5.8	138	2007
East Devon S/S, Milford - Singer S/S, Bridgeport (new substations and line) (Docket No. 272)	3.1	345	2009
Singer S/S, Bridgeport - Norwalk S/S, Norwalk (new substation and line) (Docket No. 272)	15.5	345	2009
Plumtree S/S, Bethel - Triangle S/S, Danbury (rebuild)	1.8	115	2007
Plumtree S/S, Bethel - Triangle S/S, Danbury (rebuild)	1.8	115	2007
Devon S/S, Milford - Wallingford Station, Wallingford #1640 line (rebuild portion of line) (Docket No. 272)	27	115	2009
Devon S/S, Milford - June St. S/S, Woodbridge #1685 line (rebuild portion of line) (Docket No. 272)	13.4	115	2009
North Haven S/S, North Haven - Wallingford Station, Wallingford #1630 line (rebuild portion of line) (Docket No. 272)	0.3	115	2009
North Haven S/S, North Haven - Branford S/S, Branford #1655 line (rebuild portion of line) (Docket No. 272)	1.3	115	2009
East Devon S/S, Milford - Devon S/S, Milford (new) (Docket No. 272)	1.3	115	2009
East Meriden S/S, Meriden - North Wallingford S/S, Wallingford #1466 line (rebuild portion of line) (Docket No. 272)	1.4	115	2009
June St. S/S, Woodbridge - Southington S/S, Southington #1610 line (rebuild portion of line) (Docket No. 272)	10.5	115	2009
Devon S/S, Milford - Devon Switching Station, Milford (rebuild) (Docket No. 272)	0.1	115	2009
Devon S/S, Milford - Devon Switching Station, Milford (rebuild) (Docket No. 272)	0.1	115	2009
Southington S/S, Southington - Wallingford S/S, Wallingford #1208 line (rebuild portion of line) (Docket No. 272)	2.9	115	2009
Devon S/S, Milford - Derby Junction, Shelton - Beacon Falls, S/S, Beacon Falls #1570 line (reconductor portion of line)(D272)	3.8	115	2009
Bunker Hill S/S, Waterbury - Baldwin Junction, Waterbury - Beacon Falls S/S, Beacon Falls #1575 line (rcndctcr. portion of line)(D272)	3.8	115	2009
Devon S/S, Milford - Lucchini Junction, Meriden - Southington S/S, Southington #1690 line (remove portion of line) (D272)	23.9	115	2009
Scovill Rock S/S, Middletown - Chestnut Junction, Middletown (new) (Docket No. 272)	2.6	345	2009
Oxbow Junction, Haddam - Beseck S/S, Wallingford (new switchyard and line) (Docket No. 272)	7.0	345	2009
Black Pond Junction, Middlefield - Beseck S/S, Wallingford (new switchyard and line) (Docket No. 272)	2.8	345	2009
Black Pond Junction, Middlefield - Beseck S/S, Wallingford (new switchyard and line) (Docket No. 272)	2.8	345	2009
Beseck S/S, Wallingford - East Devon S/S, Milford (new switchyard, substation and line) Docket No. 272)	33.4	345	2009
Haddam S/S - East Meriden S/S, Meriden #1975 line (rebuild portion of line) (Docket No. 272)	8.4	115	2009
Norwalk S/S, Norwalk - Glenbrook S/S, Stamford circuit #1 (new)	8.7	115	2008
Norwalk S/S, Norwalk - Glenbrook S/S, Stamford circuit #2 (new)	8.7	115	2008
Tunnel S/S, Preston - Ledyard Junction, Ledyard (rebuild & upgrade to 115-kV)	8.5	69	TBD
Ledyard Junction, Ledyard - Gales Ferry S/S, Ledyard (upgrade to 115-kV)	1.6	69	TBD
Gales Ferry S/S, Ledyard - Montville Station, Montville (upgrade to 115-kV)	2.4	69	TBD
Ledyard Junction, Ledyard - Buddington S/S, Groton (upgrade to 115-kV)	4.7	69	TBD
Card S/S, Lebanon - Wawacus Junction, Bozrah (rebuild)	12.7	115	TBD

Appendix C
Planned
Transmission Lines in Connecticut

Card S/S, Lebanon - Lake Road Station, Killingly (new)	29.2	345	TBD
Lake Road Station, Killingly - West Farnum Road S/S, R.I. (new)	7.6	345	TBD
Norwalk Harbor Station, Norwalk - Glenbrook S/S, Stamford (new)	9.2	115	TBD
South End S/S, Stamford - Tomac S/S, Greenwich #1750 line (reconductor portion of line)	0.4	115	TBD
Manchester S/S, Manchester - Hopewell S/S, Glastonbury (reconductor)	7.0	115	2006
East Meriden S/S, Meriden - North Wallingford S/S, Wallingford #1466 line (reconductor portion of line)	0.5	115	TBD
Schwab Junction, Wallingford - Colony S/S, Wallingford (new)	1.5	115	TBD
Manchester S/S, Manchester - Barbour Hill S/S, South Windsor (rebuild)	7.5	115	TBD
Southington S/S, Southington - Schwab Junction, Wallingford (unbundle/rebuild)	6.3	115	TBD
Oxbow Jct., Haddam - Beseck Jct., Wallingford (unbundle/rebuild)	14.7	115	TBD
Colony S/S, Wallingford North Wallingford S/S (unbundle)	2.4	115	TBD
Frost Bridge S/S, Watertown - Bunker Hill S/S, Waterbury	3.9	115	TBD
Frost Bridge S/S, Watertown - Walnut Jct., Thomaston (new)	6.4	115	TBD
Frost Bridge S/S, Watertown - Campville S/S, Harwinton (rebuild)	10.3	115	TBD