Connecticut Energy Advisory Board

NOTICE

This file contains the Connecticut Energy Advisory Board preliminary draft energy plan as of November 17, 2003 and Summary Comments from Board members to that plan as of December 10, 2003. The draft energy plan is a document in process and subject to ongoing revision and updating. Revisions will take into consideration public comments received during the Public Comment period and January 2004 Public Hearings.

ENERGY PLAN FOR CONNECTICUT
ENERGY ADVISORY BOARD

DRAFT

NOVEMBER 17, 2003

1. Introduction and Goals

1.1 Introduction

This Draft Energy Plan is being undertaken pursuant to An Act Studying State Energy Policies (SA 99-15) and PA-03-140 which requires the Connecticut Energy Advisory Board ("Board") to conduct:

1) An assessment of current energy suppliers, demand and costs;
2) An identification and evaluation of the factors likely to affect future energy supplies, demand and costs;
3) A statement of progress made toward long-term goals made in the previous report;
4) Recommendations for decreasing dependency on fossil fuels by promoting energy conservation, solar and other alternative energy sources;
5) An assessment of the infrastructure of the state for natural gas and electric systems;
6) An evaluation of the impact of the regional transmission infrastructure planning processes conducted by the regional independent system operator, as defined in section 15-1 of the general statues, on the state's environment, on energy market design and economic development in the state;l
7) The consideration of alternative energy planning mechanisms and targets as alternatives to integrated resource planning;
8) A statement of energy policies and long range planning objectives and strategies appropriate to achieve, among other things, the least cost mix of energy supply sources and measures that reduce the demand for energy, giving due regard to factors such as ratepayer impacts, security and diversity of fuel supply and energy generating methods, protection of public health and safety, adverse or beneficial environmental impacts, conservation of energy and energy resources and the ability of the state to compete economically; and
9) Recommendations for administrative and legislative actions to implement such policies, objectives and strategies.

This report is organized in the following manner:

- Chapter 1 presents an introduction and goals;
- Chapter 2 presents an assessment of current and future impacts on energy supply, demand and costs;
- Chapter 3 identifies progress toward goals and strategies from the previous plan;
- Chapter 4 discusses options for reducing dependence on fossil fuels;

- Chapter 5 presents an assessment of Connecticut's energy infrastructure;
- Chapter 6 identifies the impacts of the RTO planning process;
- Chapter 7 explores alternative planning mechanisms; and
- Chapter 8 summarizes the energy policy strategies and recommendations.

1.2 Energy Policy Goals

Energy Policies in Existing Laws

In 1978, the legislature established an explicit state energy policy statement in Sec. 16a-35k of Connecticut General Statutes (CGS), based in part on the prevailing concern at the time about shortages and high prices of imported petroleum. Among other things, this section includes a list of nine policy statements and declares that it is state energy policy to: conserve energy; use renewable sources to the maximum extent feasible; diversify the state's energy mix; help residents and businesses reduce energy use and bills; and ensure that poor households are able to meet their essential energy needs.

Earlier, in 1975, ratemaking principles were adopted for electric and gas utility regulation in CGS Sec. 16-19e. This section requires utilities and DPUC to promote economic development, the development and use of renewable resources and the prudent management of natural resources. The section was amended in 1979 to require that these actions conform, to the greatest extent practicable, to the state's energy policy as contained in CGS Sec. 16a-35k.

More recently, the "Act Concerning Electric Restructuring", PA 98-28 was passed in 1998, restructuring the electric industry to authorize competition in electric generation services starting in 2000. This law effectively required the electric utilities to divest their generating assets achieve lower rates and improve the State's environment and required incumbent utilities to provide, until 2004, standard offer service at a rate at least 10% below their 1996 rates to customers who do not choose an alternative supplier. The Act contains extensive environmental, consumer education and consumer protection provisions, and a specific list of twelve findings that represent additional energy policy goals for the state's electric sector.

The policy statements in these three statutes are an important foundation and point of reference for this policy report. They are discussed further below as the basis for state energy policy goals. Many other statutes also contain explicit or implicit energy-related policy statements and goals, including those addressing transportation and the environment. Finally, the Board's own initial enabling statute (Sec. 16a-3) provides policy direction by charging the Board to "recommend long-range energy supply and demand options with particular emphasis on conservation and energy resource development within the state." Sec. 16a-3 reads as follows:

1. “under section 16a-7, (A) recommend to the Governor and General Assembly programs for enhancing the state's energy management and carrying out the purposes of section 16a-35k and (B) recommend long-range energy supply and demand options with particular emphasis on conservation and energy resource development within the state,
2. act as a mediator and coordinator for programs which will identify opportunities for and concerns of the state in managing its future energy requirements, especially with regard to conservation and the use of renewable energy resources,
3. respond to requests of the General Assembly to review or examine issues requiring consideration and policy formulation and
4. examine the energy component of the state's economy as it affects citizens, government, commerce and industry."

1.3 Energy Policy Opportunities and Challenges for Connecticut

In the Act Studying State Energy Policies (SA 99-15), which originally charged the Board with responsibility for the original “study to update and strengthen the state's energy policy,” the General Assembly stated the following objectives for the study:

- to reflect emerging competition among the various public utility industries and to reflect emerging trends in new technologies,
- to repeal or modify elements of the current policy that are inconsistent with recent state and federal laws,
- to protect the interests of low-income consumers and ensure they benefit from new opportunities available through competition such as aggregation and
- to ensure that conservation of natural resources remains a high priority in the state's energy policy.”

This statute includes its own statements of energy policy with respect to low-income consumers and conservation. It also calls for an assessment of new opportunities and challenges that come with new markets and technologies. To ensure that Connecticut takes full advantage of the continued opportunities for efficient and effective supply of energy and power created by the introduction of market forces, it is time to re-examine existing structures and systems that were created during the era of regulation and large-scale power plants based on steam turbine technology. As regulatory and technological changes occur, however, many of the fundamental challenges that energy policy makers faced in the 1970s and 1980s have still not been resolved. The Board's initial enabling statute (Sec. 16a-3) emphasizes “long-range energy supply and demand options with particular emphasis on conservation and energy resource development within the State” and “the effect of the energy component of the State's economy on citizens, government, commerce and industry.” In PA 30-135 overlayed additional criteria to be

addressed in energy plans for CEAB as noted above in Section 1.1. Accordingly, this report takes a long-range and broad perspective on the energy challenges and opportunities facing all of us in Connecticut.

Economic Challenges and Opportunities

The state of Connecticut imports most of its current energy supply, including oil, coal, natural gas and uranium. In addition, the state continues to be particularly dependent on oil, which is generally imported from foreign countries. This creates a significant continuing risk of economic disruption from sudden cost escalation or supply interruption, conditions over which we have little or no control. This export of energy dollars from our state also puts us at a competitive disadvantage. The competitive environment could accentuate that export of dollars, because there is no longer any assurance that generation (and the dollars and jobs associated with it) will happen in state. Decreasing oil/fossil dependence also improves energy security.

Energy supply and pricing have a substantial influence on economic growth within the state of Connecticut, particularly in the industrial sector. Energy prices in New England are much higher than prices in most of the United States and represent a competitive disadvantage to Connecticut businesses and an economic burden to Connecticut families. The introduction of competition in many parts of the electric and natural gas industries in Connecticut and other Northeast states has been driven primarily by the need to drive down energy costs as much as possible. New trends in the developing market have had specific implications for Connecticut. The implementation of Locational Marginal Pricing (LMP) may have substantial economic impacts on Connecticut, as Connecticut is an area of congestion, hence the higher LMP in New England.

In addition, the development of a "conservation ethic" which emphasizes increased energy efficiency offers additional opportunities to reduce energy costs, as well as creating several other economic and environmental opportunities for the state—notably a new industry devoted to creation of high efficiency products, renewable technologies and fuel cells. At the crux of the conservation ethic is the notion that every dollar that Connecticut business, industry and consumers don't have to spend on energy can be used for some other more productive purpose. Likewise, every kilowatt of electricity we don't have to generate consumes no resources and causes no pollution.

As indicated by the legislature in S.A. 99-15, new energy policies also need to account for the unequal impact that the changing energy marketplace may inflict upon our citizens. A number of workers in the energy sector face a loss of jobs due to utility restructuring. However, enlightened policy changes may lead to the creation of additional jobs in other sectors of the economy as a result of new opportunities in the marketplace. As market forces are put into effect, the ability of low-income customers to manage energy costs, especially in a deregulated market, is a concern. Similarly, siting new generation plants or other energy facilities may adversely affect local residents and can become a contentious political issue.

Environmental Challenges and Opportunities

Consumption (and conversion) of energy is the primary source of air pollution in our state, resulting in emissions of SO_X, NO_X, CO, CO_2, mercury and other pollutants. These air emissions contribute to a range of undesirable consequences including acid rain, global warming[climate change is the preferred term. Some areas may get warmer, some cooler, along with accompanying increased frequency of damanging storms, higher or lower rainfall, etc] water pollution and potential health problems. Some electric generating facilities have also been a significant source of other environmental impacts. While environmental regulations have internalized some of these costs to the economy and the environment, the costs associated with the remaining air emissions represent what economists call "externalities" that are not fully reflected in the price we pay for energy. Global climate change concerns are resulting in increasing calls for action to reduce the production of greenhouse gases. All of these environmental issues deserve consideration as Connecticut undertakes energy policy discussions. [reference New England Governors/ Eastern Canadian Prermiers Climate Change Action Plan, signed in 2001 and recently reaffirmed under Gov Rowland's leadership]

Current global energy use and energy supply patterns are not sustainable. The creation of a sustainable future requires agreement on a common definition of sustainability. In general terms, sustainability refers to economic activity in today's world that does not interfere with the ability of future generations to enjoy their own economic prosperity, public health and natural environment.

1.4 Energy Policy Goals

Changing energy markets and new energy technologies are expected to bring significant benefits, as noted above, with some associated significant challenges. The role of public policy is to assess markets and technologies in order to identify responses to these challenges in order to meet public policy goals. This section presents a framework of energy policy goals that address the challenges and opportunities discussed above. For some of the goals in this framework, significant progress can be made through the forces of the market and through new technology development. Other goals address the effects of energy use and the impacts of energy industry operations that are not fully captured in energy prices and energy markets and where the public sector needs to assume a greater role. Specific strategies and actions are discussed throughout the report.

A comparison of the Act Concerning Electric Restructuring (Sec. 16-244 in P.L 98-28) with the earlier policy statements cited above (Sec. 16-35k and 16-19e) shows a great deal of consistency across the decades. The following individual goals and categories (listed in no particular order) are based on these legislative policy statements and other relevant legislative policy provisions:

A. Economic

- reduce energy costs and provide affordable energy supplies,
- support economic development and economic vitality,
- protect all consumers and workers, including low-income residents.

B. Environmental

- improve environmental quality,
- conserve natural resources and achieve sustainability,
- maintain safety and public health,
- reduce emissions of carbon dioxide and other greenhouse gases that contribute to global climate change to 1990 levels by 2010, [NEG/ECP goals ae to stabilize 1990 GHG emissions by 2010, to reduce them 10% further by 2020 and by 75-85% over the long term.
- improve pollution prevention.

C. Risk Mitigation

- increase the safety and reliability of energy supply,
- increase energy efficiency and promote energy conservation,
- increase energy portfolio diversity to minimize supply and price risk,
- increase use of renewable energy resources,
- maintain existing in-state supply side resources,
- promote fuel diversity to reduce reliance on petroleum sources,
- secure natural gas and electric facilities against safety threats through increased security measures,
- promote the development and penetration of new distributed generation technologies,
- promote load response and load management,
- develop in-state energy supply-side and demand-side resources.
- Promote innovative applications which increase grid reliability [example: use photovoltaics at transformer location to cool them on hot days. This will allow more MW to flow through wires. Such an application is not conservation, but clearly has benefits.

D. Competitive Markets

- facilitate fair competition among existing and emerging technologies,
- ensure stability in rules for market design,
- monitor rules for standard market design,
- provide customer access to competitive markets,
- provide customers choice among alternative generation services and a reasonable opportunity for self-generation and interconnection,
- streamline regulation to provide strong incentives to meet energy goals.

E. Policy Development and Coordination

- coordinate development and implementation of energy policies,
- coordinate with the RTO on transmission related energy policies,
- play an active role in federal and RTO proceedings,
- assure that all state government actions are consistent with adopted energy policy,
- allocate available energy resources equitably in shortages,
- promote informed citizen responsibility for energy decision making.

The above goals will be the basis for the recommended polices, strategies and actions that are presented in this Energy Plan.

2. Current and Future Impacts on Energy Supply

This chapter summarizes key energy patterns and trends in Connecticut that include energy sources, current supply, and the current and future impacts on energy supply. The most recent data available on a consistent basis across all fuels and end uses in Connecticut is for the year 2000, from the U.S. DOE State Energy Data Report (SEDR), which was one of the primary sources of data used for this overview. Other data comes from the Connecticut Siting Council and ISO New England.

2.1 Electric Supply and Demand Balance

Connecticut's electric supply resources consist of a diverse combination of coal, natural gas, oil-fired, dual-fueled (oil/gas), hydro and nuclear plants (both base load and peaking plants) along with generation from renewable sources and power purchases from outside the state. Sufficient supply exists to meet current and expected demand of electricity needs through 2011 as shown in the figure below. As this figure also illustrates after 2011 current units that are over 40 years old may be retired and reserve margins may decrease.

Figure 2-1
Connecticut Balance of Supply and Demand of Electricity (MW)

CT Balance of Supply and Demand of Electricity

Reported in Megawatts (MW)

	status quo generation scenario			less retirement of units scenario		
	2002	2004	2011	2002	2004	2011
Installed capacity[1]	6192	7234	8834	6192	7234	8834
Capacity additions						
Killingly	792			792		
Milford[2]		544			544	
Wallingford	250			250		
Meriden[2]		544			544	
Oxford[2]		512			512	
Transmission Import Capability[3]	2200	2200	2200	2200	2200	2200
Load shift/Op-4 Action	562	562	562	562	562	562
Units 40 years if age or greater retired						-1739
Resources to meet Peak Demand	**9996**	**11596**	**11596**	**9996**	**11596**	**9857**
Peak Demand[4] - summer	**6296**	**6388**	**6768**	**6296**	**6388**	**6768**
CT reserves	3700	5208	4828	3700	5208	3089
Reserve/Resources* 100%	37%	45%	42%	37%	45%	31%

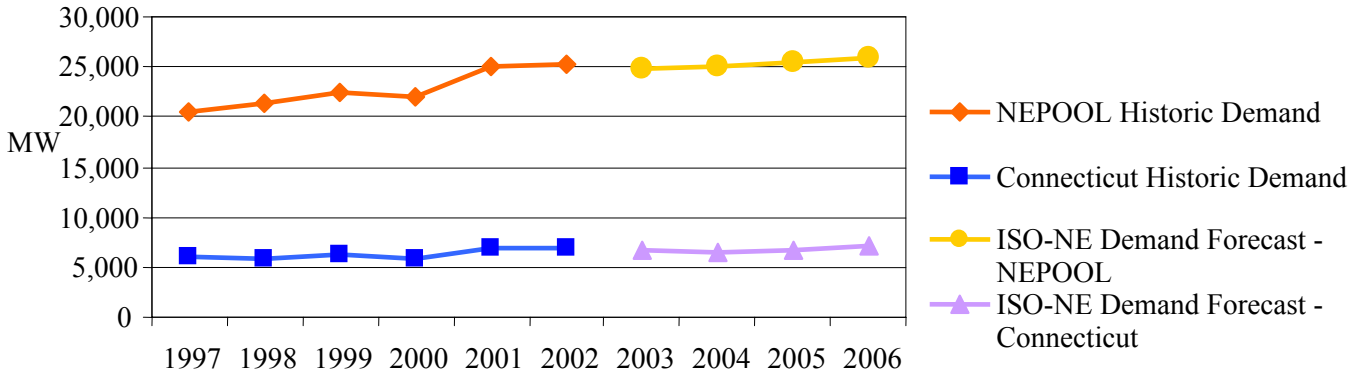
1 - Summer rating as reported in CSC Review of the Connecticut Electric Utilities 2002 Twenty-Year Forcasts of Loads and Resources-Appendix A
2 - The proposed schedule for commercial operation of these facilities are either postponed or uncertain.
3 - Average of daily transfer limits during daily peak demand for summers 1997-1999, noting Millstone Units #2 and #3 did not operate in 1997 and Millstone Unit #2 did not operate in 1998.
4 - Projected peak demand as reported by CL&P, UI, and CMEEC forecast filings to the CSC on March 1, 2002.

Source: Connecticut Siting Council, 2002

Electric Demand

Figure 2-2 shows the growth in Connecticut's peak load as well as New England since 1997. While Connecticut's customer load has been increasing over time, unusually hot and humid weather during the summers of 2001 and 2002 contributed significantly to the accelerated peak load growth. In 2001, Connecticut's summer peak load was 6,799 MW, exceeding the prior year's record peak by 899 MW. The 2001 record peak load was eclipsed in 2002 when the new record of 6,884 MW was set on July 3, 2002. ISO-NE forecasts that the state's peak load will reach 7,023 MW by 2006 under normal weather conditions as the state's population and economy grow.[1]

Figure 2-2
Historic Peak Load Growth in Connecticut and New England



Electric Supply

Connecticut's installed electric generating capacity currently totals 7,037 MW based on summer ratings, as shown in Table 2-1. Currently, 67% of the installed electric generation capacity geographically located in Connecticut is derived from fossil fuels, approximately 28% is derived from Millstone #2 and #3 nuclear units, and approximately 5% is derived from hydropower and solid waste

Connecticut's utilities are required to forecast incremental total electricity consumption and provide such information annually to the Siting Council. According to the Siting Council

[1] ISO-NE *Technical Assessment of the Generating Resources Required to Reliably Operate Connecticut's Bulk Electric System 2003 and 2006*. Final Report. System Planning, January 29, 2003.

Forecast of Loads and Resources, total electricity requirements in Connecticut are projected to grow at an annual average growth rate of 1.1%, to 36,064 GWh in 2011.[2]

In response to low cost natural gas in the second half of the 1990s, continued turbine technology improvements, new supply sources from Atlantic Canada, and increasingly stringent environmental emissions restrictions, natural gas has become the fuel of choice for new generation throughout New England. Upon commercialization of the remaining generation capacity that has received Siting Council approval, the new fleet of gas-fired plants, with or without backup fuel oil capability, will become the predominant generation technology type in Connecticut.

[2] Connecticut Siting Council, *Review of the Connecticut Electric Utilities' Ten-Year Forecasts of Loads and Resources, 2002*.

Table 2-1
Connecticut's Electric Generation Capacity[3]

Station Name (location)	Owner or Primary Contract Holder[4]	Summer Capability (MW)	Primary Energy Source	Alt Energy Source	Commercial Operation
AES Thames (Montville)	NU	181	Coal	DFO	12/1/1989
Branford 10 (Branford)	NRG	16	Jet Fuel		1/1/1969
Bridgeport Energy 1 (Bridgeport)	Duke Energy	448	Gas		8/1/1998
Bridgeport Harbor 2 (Bridgeport)	PSEG	34	RFO		8/1/1961
Bridgeport Harbor 3 (Bridgeport)	PSEG	372	Coal	RFO	8/1/1968
Bridgeport Harbor 4 (Bridgeport)	PSEG	10	Jet Fuel		10/1/1967
Bridgeport RESCO (Bridgeport)	UI	59	MSW		4/1/1988
Bristol Refuse (Bristol)	NU	13	MSW	DFO	5/1/1988
Bulls Bridge (New Milford)	Select Energy Inc.	8	Hydro		1/1/1903
CDECCA (Hartford)	El Paso Merchant Energy	55	Gas	DFO	11/1/1988
Cos Cob 10 (Greenwich)	NRG	18	Jet Fuel		9/1/1969
Cos Cob 11 (Greenwich)	NRG	18	Jet Fuel		1/1/1969
Cos Cob 12 (Greenwich)	NRG	16	Jet Fuel		1/1/1969
Derby Dam (Shelton)	NU	7	Hydro		3/1/1989
Devon 11 (Milford)	NRG	30	Gas	DFO	10/1/1996
Devon 12(Milford)	NRG	30	Gas	DFO	10/1/1996
Devon 13(Milford)	NRG	33	Gas	DFO	10/1/1996
Devon 14(Milford)	NRG	30	Gas	DFO	10/1/1996
Devon 7(Milford)	NRG .	107	RFO	NG	1/1/1956
Devon 8(Milford)	NRG	107	RFO	NG	1/1/1958
Dexter (Windsor Locks)	NU	38	Gas	DFO	5/1/1990
Exeter (Sterling)	NU	26	Tires	DFO	12/1/1991
Falls Village (Canaan)	Select Energy Inc.	10	Hydro		1/1/1914
Franklin Drive 10 (Torrington)	NRG	16	Jet Fuel		11/1/1968
Lake Road 1 (Killingly)	PG&E	223	Gas	DFO	7/1/2001
Lake Road 2 (Killingly)	PG&E	231	Gas	DFO	11/1/2001
Lake Road 3 (Killingly)	PG&E	237	Gas	DFO	5/1/2002
Lisbon Resource Recovery (Lisbon)	NU	13	MSW		1/1/1996
Middletown 10 (Middletown)	NRG	17	Jet Fuel		1/1/1966
Middletown 2 (Middletown)	NRG	117	RFO	NG	1/1/1958
Middletown 3 (Middletown)	NRG	236	RFO	NG	1/1/1964
Middletown 4 (Middletown)	NRG	400	RFO		6/1/1973
Millstone Point 2 (Waterford)	Dominion Nuclear CT, Inc.	872	Nuclear		12/1/1975
Millstone Point 3 (Waterford)	Dominion Nuclear CT, Inc.	54	Nuclear		4/1/1986
Millstone Point 3 (Waterford)	Dominion Nuclear CT,	20	Nuclear		4/1/1986

[3] ISO-NE, *2003 Capacity Energy Load and Transmission (CELT) Report*, April 2003 Does not include units less than 5 MW or units where all generation is used on-site by host.
[4] Primary Contract Holder is shown where the project owner is not a NEPOOL participant

	Inc.				
Millstone Point 3 (Waterford)	Dominion Nuclear CT, Inc.	1057	Nuclear		4/1/1986
Montville 10 & 11 (Montville)	NRG	5	DFO		1/1/1967
Montville 5 (Montville)	NRG	81	RFO	NG	1/1/1954
Montville 6 (Montville)	NRG	407	RFO		7/1/1971
New Haven Harbor (New Haven)	PSEG	461	RFO	NG	8/1/1975
Norwalk Harbor 1 (Norwalk)	NRG	162	RFO		1/1/1960
Norwalk Harbor 2 (Norwalk)	NRG	168	RFO		1/1/1963
Norwich Jet (Norwich)	CMEEC	15	DFO		9/1/1972
Wallingford Unit 1	PPL	45	Gas		7/31/2001
Wallingford Unit 2	PPL	41	Gas		7/31/2001
Wallingford Unit 3	PPL	46	Gas		7/31/2001
Wallingford Unit 4	PPL	42	Gas		7/31/2001
Wallingford Unit 5	PPL	41	Gas		7/31/2001
Rainbow Windsor	NU	8	Hydro		1/1/1980
Rocky River (New Milford)	Select Energy Inc.	29	Hydro		1/1/1929
SCRRA-Preston	NU	16	MSW	DFO	1/1/1992
Shepaug (Southbury)	Select Energy Inc.	42	Hydro		1/1/1955
So. Meadow 11 (Hartford)	Select Energy Inc.	36	Jet Fuel		8/1/1970
So. Meadow 12 (Hartford)	Select Energy Inc.	38	Jet Fuel		8/1/1970
So. Meadow 13 (Hartford)	Select Energy Inc.	38	Jet Fuel		8/1/1970
So. Meadow 14 (Hartford)	Select Energy Inc.	37	Jet Fuel		8/1/1970
So. Meadow 5 (Hartford)	NU	26	MSW		11/1/1987
So. Meadow 6 (Hartford)	NU	27	MSW		11/1/1987
Stevenson (Monroe)	Select Energy Inc.	28	Hydro		1/1/1936
Torrington Terminal 10 (Torrington)	NRG	16	Jet Fuel		8/1/1967
Tunnel 10 (Preston)	Select Energy Inc.	17	Jet Fuel		1/1/1969
Wallingford Refuse (Wallingford)	NU	6	MSW	DFO	3/1/1989
Total		7,037			

(note: Fuel type needs to be defined)

The total installed capacity includes 1,042 MW from the new gas turbines at Wallingford (250 MW)[5] and the Lake Road facility in Killingly (792 MW), which began commercial operation in 2002. Although the Lake Road generation facility is physically located in Connecticut, electrically it is considered to be interconnected in Rhode Island. Several other projects are in development, but have not yet begun commercial operation, including:

- Milford Power, which consists of two gas-fired 268 MW (536 total MW) combined cycle turbine units (summer rating). Construction is nearly complete, but due to contractual and legal issues, commercial operation could be delayed to late 2003 or even beyond.

[5] PPL Wallingford recently made filings with ISO-NE seeking to temporarily deactivate four (4) of the five (5) LM6000 simple cycle gas-fired generating units for a period of two (2) to four (4) years beginning on or before July 1, 2003.

- Quinnipiac Energy intends to refurbish the formerly deactivated English Station in New Haven, and operate it as an oil-fired peaking facility consisting of two 35 MW steam turbine generators (70 MW total). Commercial operation is expected in 2003. [Not. Refer to recent decision by Commissioner Rocque]
- Attached is a news release on this decision. http://www.dep.state.ct.us/whatshap/press/2003/mf0626.htm
- Meriden Power, which consists of two gas fired 235 MW combined cycle turbine units (470 total MW). Construction at the Meriden project is inactive. The project is reportedly having financial difficulties, but has received an extension from the Siting Council.
- Oxford Power (also referred to as Towantic Energy), which consists of two combined cycle gas-fired combustion turbines totaling 536 MW. The Oxford project received Siting Council approval, but has not yet commenced construction due to litigation. Moreover, ISO-NE approval was rescinded in March 2003.
- Kleen Energy Systems, which consists of two gas-fired combined cycle turbines totaling 520 MW. This project was certificated by the Siting Council in November 2002. However, this unit has not received ISO-NE approval to start commercial operation.

Electric Retail Costs and Utility Data

Table 2-2 displays 2000 electric cost and electric utility data for the state of Connecticut, its two major investor owned utilities, Connecticut Light & Power (CL&P) and United Illuminating (UI), as well as the various municipal utilities as a group. The total cost of electricity in Connecticut to end-use customers, including generation, transmission and delivery, was appreciably above the national average but slightly lower than that of the New England region.

CL&P is the largest electric utility in Connecticut, serving about three-quarters of the state in terms of both customers and load. UI serves about one-fifth of the state with the municipals serving the remaining 5%. This information is divided by the three end use sectors, residential, commercial, and industrial, and, as a comparison, price information is provided for the New England region and the United States.

As of 2000, the Connecticut electricity customer base is divided as follows: 90.8% residential, 8.7% commercial, and 0.5% industrial. Residential customers use 39.9% of the total electricity load in the state, commercial customers use another 41.5%, and industrial customers consume the remaining 18.6%.

Table 2-2
2001 Electric Utility Data

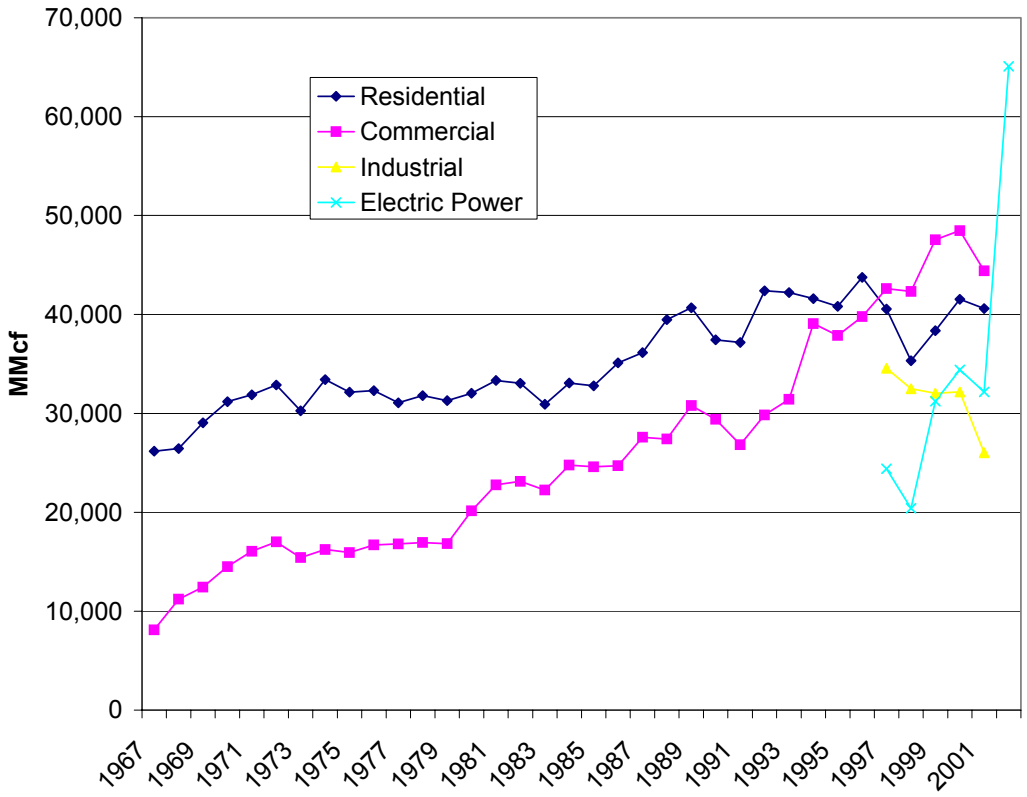
2001	Residential			Commercial			Industrial		
	Customers	MWh	Cost	Customers	MWh	Cost	Customers	MWh	Cost
CL&P	1051606	9,326,376	$0.106	95,987	9459756	$9.040	4,026	3849545	$0.074
UI	286,331	2,120,470	$0.126	29,889	2476000	$10.290	1,707	1082000	$0.088
Munis	57,050	493,656	$0.114	41,410	506,293	$10.160	148	616,451	$0.076
CT	1,395,720	11,964,568	$0.109	134542	12,442,049	$0.093	5,882	5,572,234	$0.076
NE	5,822,935	43,161,278	$0.119	714,049	51,496,440	$0.106	24,104	22,622,222	$0.091
US	114,317,707	1,202,646,738	$0.086	14,939,895	1,089,153,700	$0.079	574,361	964,224,282	$0.050

Natural Gas Demand

Figure 2-3 displays the historical natural gas consumption of the four end use sectors of Connecticut's economy: Residential, Commercial, Industrial, and Electric Power Plant. All sectors except Industrial exhibited an increase in energy usage. While usage in the Residential and Commercial sectors has slowly risen over the last four decades, the Commercial sectors have displayed strongest growth. Electric power plant consumption of natural gas increased markedly in the late 1990s as additional natural gas power plants came online, including Bridgeport Energy 1 in 1998. Consumption in this sector spiked in 2002 as 7 gas-fired power plants came online (Lake Road 1 and 2; Wallingford units 1-5). Residential, commercial and industrial sectors showed a decrease in the mid to late 1990s, due to warmer than normal winters.

Compared to U.S. natural gas consumption by sector in 2001, Connecticut accounts for 0.85% of residential, 1.46% commercial, 0.35% industrial, and 0.62% electric utility delivery consumption.

Figure 2-3
Natural Gas Consumption by Sector in Connecticut



Natural Gas Retail Costs and Utility Data

The cost of natural gas consists of three main components: transmission costs (to move the gas by pipeline from the source); distribution costs (to bring the gas from the gas company to customer); and the commodity costs (cost of the gas itself). Table 2-3 displays 2001 natural gas costs, customer and consumption data for the state of Connecticut, drawn from EIA's *Natural Gas Annual 2001* report. Delivered natural gas costs have been historically higher in Connecticut and New England compared to other regions of the country due to the distance that natural gas must be transported as well as differences in the amount of available pipeline capacity.

Three investor-owned natural gas utilities serve Connecticut customers: Connecticut Natural Gas Corporation (CNG), Yankee Gas Services Company and Southern Connecticut Gas Company (SCG). Yankee Gas is the largest by customer count at 191,000, and SCG serves about 167,000 customers, most of which are located along or near the shores of Long Island Sound. CNG serves 141,000 customers in 21 communities, in the Hartford-New Britain area

and Greenwich. The City of Norwich (Dept of Public Utilities) is the largest municipal gas utility in the state.

This information is divided by the three end use sectors, residential, commercial, and industrial, and, as a comparison, price information is provided for the United States. As of 2001, the Connecticut natural gas customer base is divided as follows: 89.5% residential, 9.8% commercial, and 0.7% industrial. Residential customers use 36.6% of the total electricity load in the state, commercial customers use another 40%, and industrial customers consume the remaining 23.4%.

Table 2-3
2001 Natural Gas Data by Customer Class

2001	Residential			Commercial			Industrial		
	Customers	MMcf	Cost ($/MCF)	Customers	MMcf	Cost ($/MCF)	Customers	MMcf	Cost ($/MCF)
CT	458,195	40,599	12.20	50,415	44,404	7.68	3,580	26,019	6.77
NE	2,089,419	175,657	n/a	220,634	131,353	n/a	14,213	135,541	n/a
US	60,252,745	4,776,186	$9.640	5,030,122	3,037,450	$8.430	216,058	7,363,081	$5.280

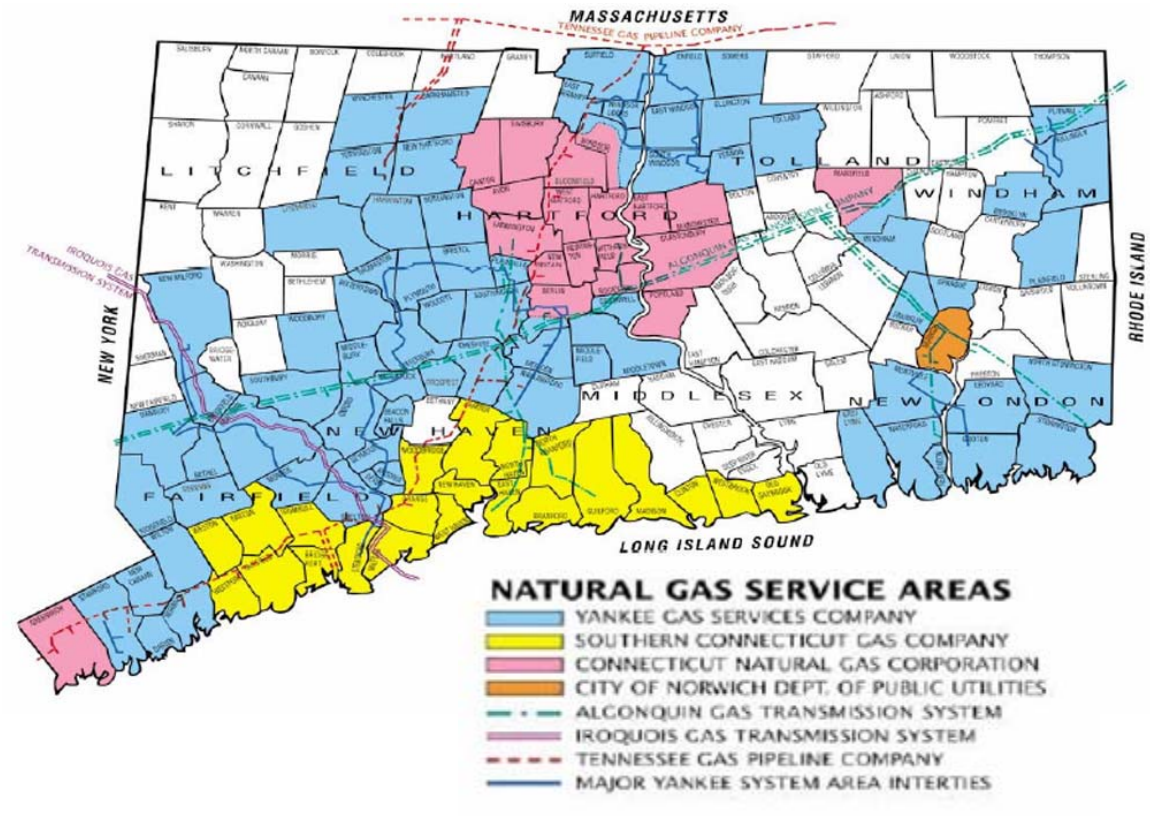
Natural Gas Pipelines

Figure 2-1 shows utility territories as well as major interstate pipelines entering the state, including Tennessee Gas, Algonquin Gas, and Iroquois Pipeline. Connecticut has no natural gas reserves or oil or gas well production within its borders, and consequently is dependent on the interstate natural gas pipeline network from neighboring Massachusetts and New York for its consumption needs.

According to a 2001 U.S. DOE report, all of the New England states except Vermont are using 80 percent or more of capacity during peak months.[6] Several pipeline expansion projects were completed in 2001-2002 in the New England region, mainly to serve Boston and New York City, although not in Connecticut. The Federal Energy Regulatory Commission is responsible for siting decisions.

[6] Natural Gas Transportation - Infrastructure Issues and Operational Trends, EIA, October 2001.

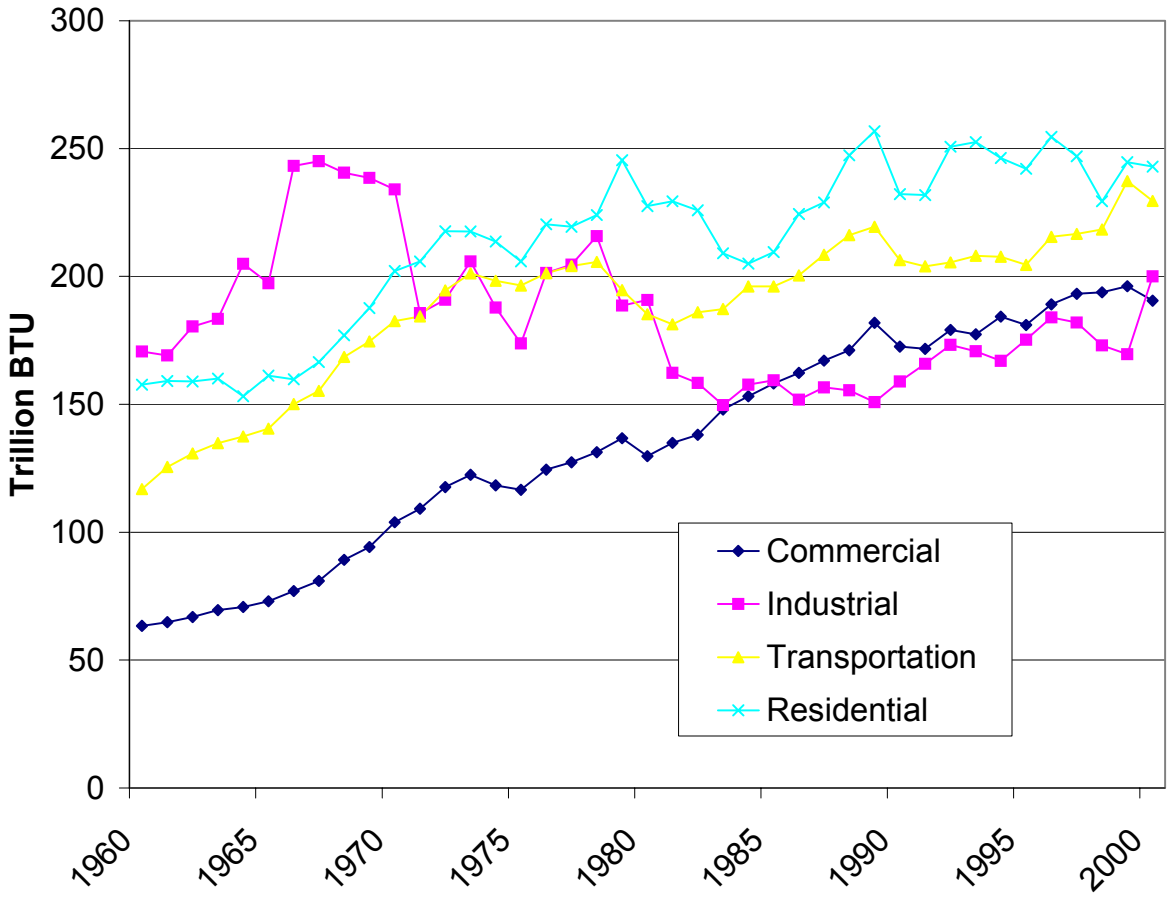
Figure 2-4
Gas Utility Territories and Pipelines



Historical Energy Consumption

Figure 2-5 displays the historical energy consumption of the four end use sectors of Connecticut's economy: Residential, Commercial, Industrial, and Transportation. All sectors exhibited an increase in energy usage. While usage in the Residential and Transportation sectors has slowly risen over the last four decades, the Commercial sectors have displayed strongest growth. The Industrial sectors usage decreased during the energy crunch in the 1970s, but has increased steadily from the early 1980s through the 1990s. These trends in energy consumption are affected by many factors, including the economy, price and energy conservation measures.

Figure 2-5
Historical Energy Consumption by Sector in CT



In 2000, the residential sector was the largest consumer of energy in the state, followed by the transportation, commercial, and industrial sectors (see Figure 2-5). The percentage values in Figure 2-6 display the proportion of each sector's total energy represented by that energy source.

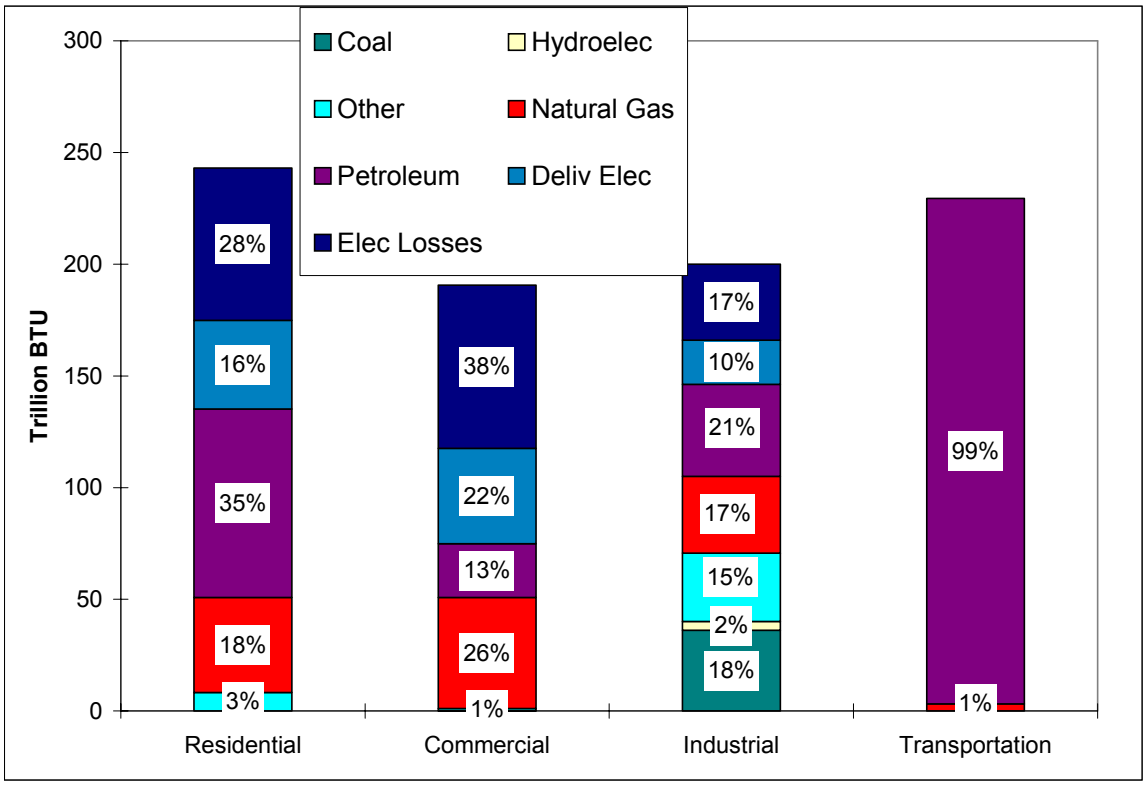
The 'delivered electricity' category represents the electricity distributed by electric utilities. The 'electricity losses' category represents energy lost during the conversion of fuel to electricity at the generation plant as well as the line losses incurred during the transmission and distribution of electricity. Although not shown in Figure 2-6, in 1997, with all four nuclear plants shutdown, electric utilities relied on petroleum for almost 60% of their energy, coal for 20%, natural gas for 12%, and hydroelectric power for another 8%. In contrast, during 1995, when several nuclear

plants were operating, electric utilities relied on nuclear power for 68% of their energy, petroleum for 12%, coal for 8%, natural gas for 7%, and hydroelectric power for another 5%.

The figure shows the substantial fraction of the energy that becomes unavailable for doing useful work after having been consumed for power generation or consumed by end users for heat or other purposes. Electricity losses comprise almost one-third of the energy consumed in the residential and industrial sectors and over 40% of the energy consumed in the commercial sector. To some extent, that is the necessary result of converting fuel to power or heat, but the magnitude of the "wasted" energy underscores the need – and the opportunity – to reclaim some of that unused energy through increased efficiency of combustion and delivery, including the use of cogeneration or combined heat and power (CHP), in which the use of the thermal byproduct from power generation replaces the need to burn fuel for heating and other thermal applications.

Electricity meets approximately 10-20% of the energy needs in the residential, commercial, and industrial sectors. Not surprisingly, the transportation sector relies almost exclusively on petroleum and therefore consumes the bulk of this fuel used in Connecticut, almost one-half of the total. In addition to supplying the entire transportation sector, petroleum meets one-third of residential energy demand, 13% of commercial demand, and 21% of industrial demand. Natural gas supplies about one-quarter of the energy used in the commercial and industrial sectors and 17% in the residential sectors.

Figure 2-6
Energy Sources by Sector in CT in 2000



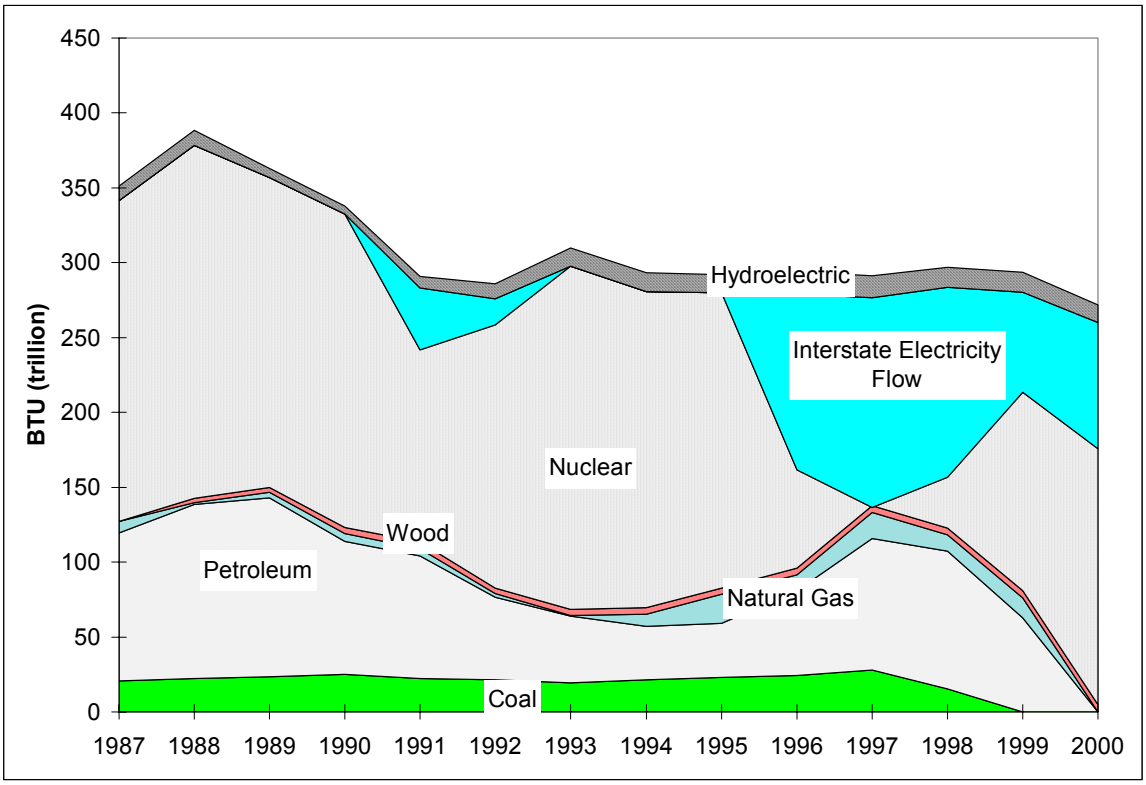
Consumption: Electric Utilities

Figure 2-7 displays the energy sources consumed by Connecticut electric utilities since 1987. Total generation from Connecticut electric utilities rapidly declined in the late 1990s due to the shutdown of nuclear plants. Generation in 1997 was one-half that of 1995, with imported interstate electricity making up most of the difference, but the figure in 2000 is close to 1995 levels. Petroleum usage by electric utilities has climbed over 50% since the nuclear power shutdowns, but decreased when the Millstone 2 and 3 nuclear plants began operating again in 1998. These developments increased the nuclear generation from electric utilities and therefore decreased the flow of imported electricity to Connecticut.

Coal and natural gas consumption by electric generating plants has continued to increase, according to the department that compiles this data at EIA, but the decrease shown since 1997 reflects the sale of plants to non-utility generators. Non-utility generating facilities are reported under the “Industrial” category.

Figure 2-7

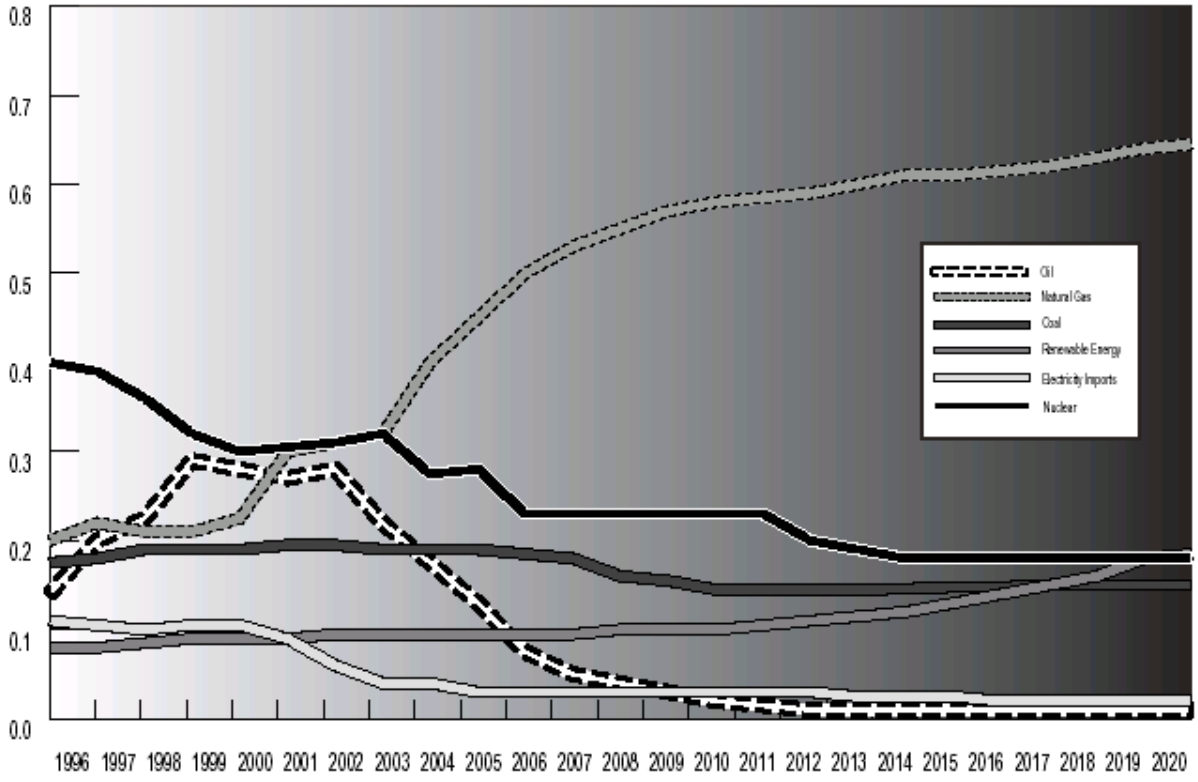
Energy Sources Consumed by Electric Utilities in CT



The increasing trend for gas use is expected to accelerate in the future. For example, the following graph (Figure 2-8) from the Connecticut Siting Council projects a dramatic increase in natural gas use for power generation in New England. Additional data and projections are available at the Siting Council's website (http://www.state.ct.us/csc/): Review of the Connecticut Electric Utilities' 2002 Twenty-Year Forecasts of Loads and Resources.

Figure 2-8

: Fuel Consumption for Electric Generation within ISO-New England 1996-2020



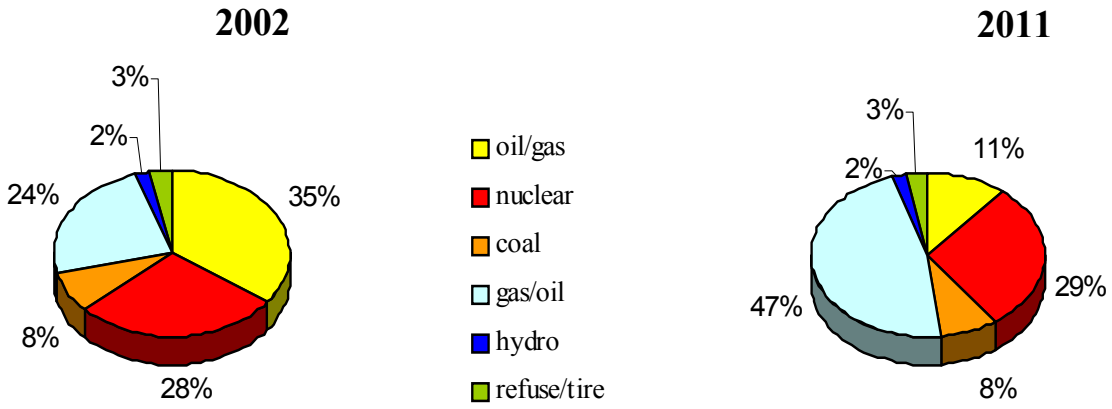
With the exception of Quinnipiac Energy's refurbishment of the old English Station, virtually all new generation capacity installed in Connecticut since 1999 or under construction is gas-fired. In addition, there is approximately 2,209 MW of oil- and gas-fired quick-start generating units in New England[7] that are often forced to operate under

[7] ISO-NE Seasonal Claimed Capability (SCC) Report as of 5/01/03 (summary information on p. 10) May 2003 Excel file at: http://www.iso-ne.com/seasonal_claim_capability_report/.

uneconomic dispatch. For 2002, ISO-NE issued an RFP and developed 80 MW of temporary demand response capability for SWCT. In the spring of 2003, CL&P issued two RFPs seeking up to 80 MW of additional generation for SWCT for the summer 2003 peak load period.

In response to low cost natural gas in the second half of the 1990s, continued turbine technology improvements, new supply sources from Atlantic Canada, and increasingly stringent environmental emissions restrictions, natural gas has become the fuel of choice for new generation throughout New England. Upon commercialization of the remaining generation capacity that has received Siting Council approval, the new fleet of gas fired plants, with or without backup fuel oil capability, will become the predominant generation technology type in Connecticut (Figure 2-9).

Figure 2-9
Connecticut's Electric Capacity Fuel Mix[8]



Energy Consumption, by Source

Figure 2-10 displays the overall energy usage and sources of energy consumed by all sectors of Connecticut's economy from 1960 through 2000. Total energy usage rose sharply in the 1960s, spiked in the 1970s, fell in the early 1980s and has generally risen ever since. Figure 1 clearly indicates that petroleum has always been the major source of Connecticut's energy. Nuclear power supplied a substantial portion of electric generation until the shutdown, both permanent and temporary, of units at Millstone in 1995. All four nuclear plants in the state were shutdown

[8] Source: Connecticut Siting Council Forecast of Loads and Resources 2002 note that oil/gas refers to primarily oil-fired plants with gas fired capability, and gas/oil refers to primarily gas-fired plants with oil burning capability.

for a variety of problems during 1997. As shown in the Figure, nuclear energy consumption again rose in 1998 to 2000 when Millstone Units 2 and 3 were restarted.

Connecticut has traditionally been a net exporter of electricity to adjoining states, as exemplified by the negative values in Figure 2-10. However, more electricity flowed into rather than out of Connecticut in the late 1990s, primarily due to the nuclear plant shutdowns, as discussed above, and much electricity was imported from other states, primarily in New England. Before the shutdowns, nuclear plants played a substantial role in supplying the state's demand for electricity. The nuclear plant shutdowns increased the demand for petroleum over the last several years, reversing a long downward trend. Net electricity imports decreased and petroleum consumption again increased starting in 1998 as the Millstone nuclear units went back online.

Slow growth has characterized the consumption of natural gas over the past four decades, while coal use has declined and remained low and is not expected to increase substantially in the coming years. Hydroelectric and biomass power have contributed a small portion of the state's power supply at approximately 2 percent and 5 percent, respectively, with biomass a small but steadily increasing share of Connecticut's energy supply since the 1980s.

Figure 2-10
Historical Energy Use by Source in CT

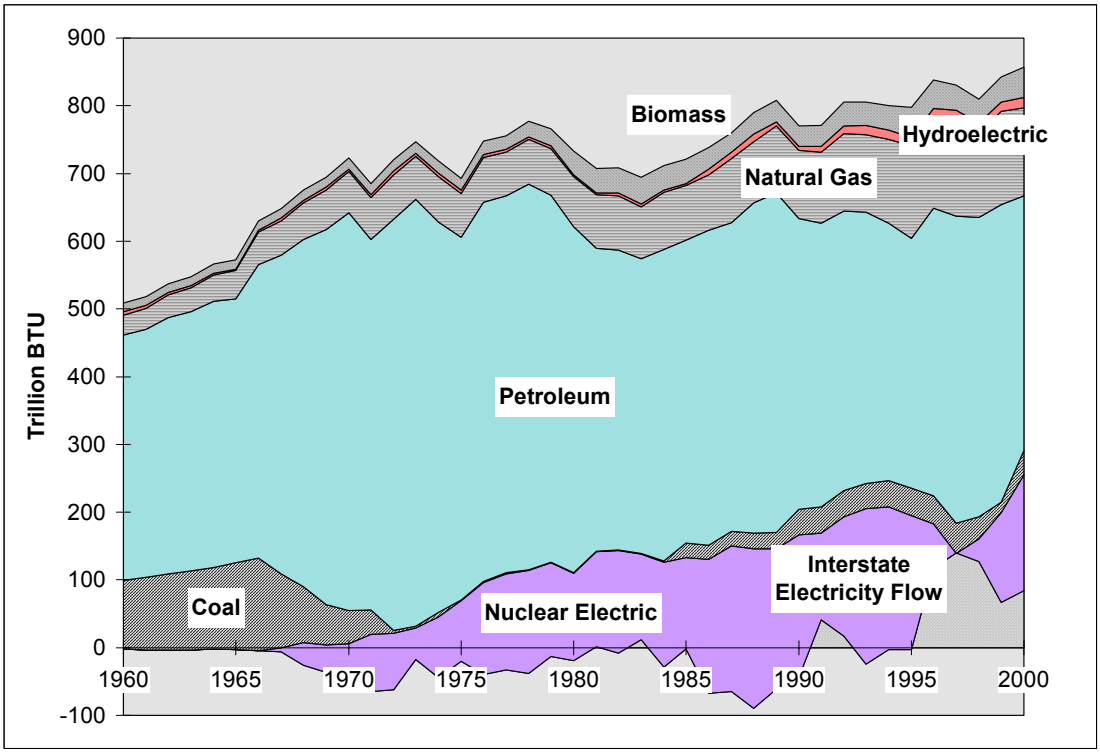
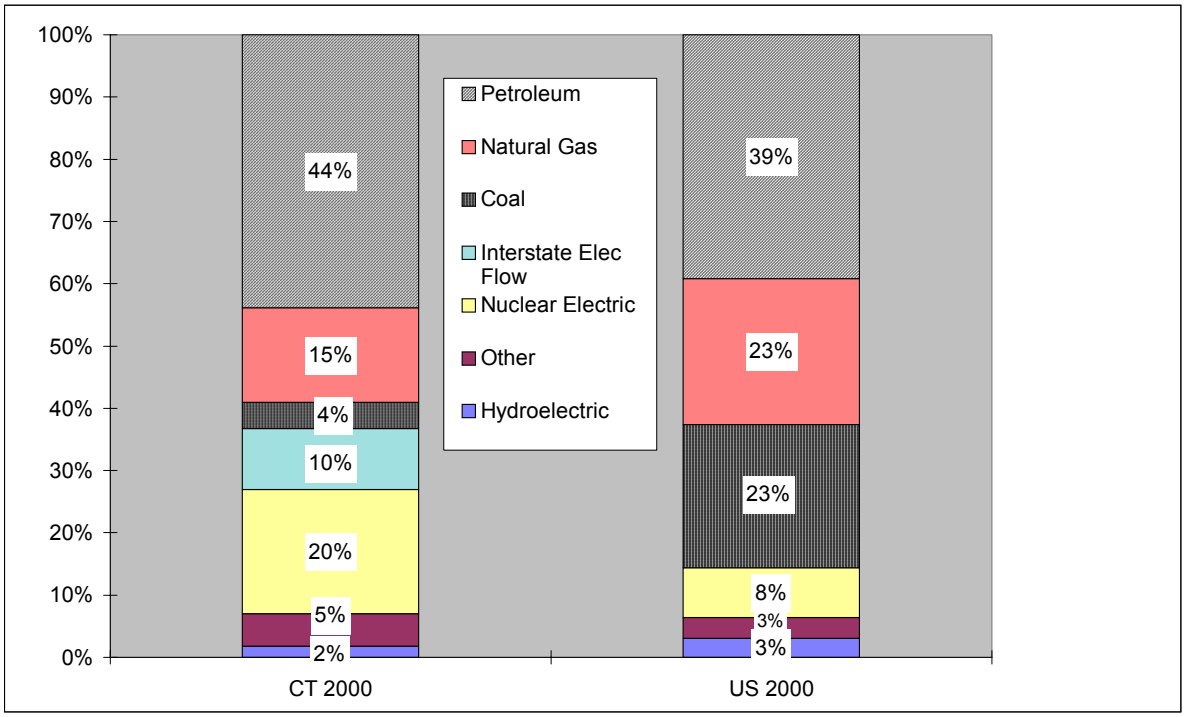


Figure 2-11 below compares the sources of energy consumed in Connecticut and the United States in 2000.

During 2000, petroleum supplied 44% of Connecticut's energy, and in comparison, petroleum supplied 39% of the nation's energy. Natural gas supplies almost one-quarter of the nation's energy needs, although slightly less in Connecticut at roughly one-sixth. The heavy reliance of the U.S. on coal-fired generation, at 23%, is contrasted by the very low use of coal in Connecticut, at only 4%. Nuclear power generated one-fifth of Connecticut's energy in 2000, but only 8% of the entire United States. Hydroelectric dams still supply a slight larger portion of the energy in the nation (3%) than in Connecticut (2%).

In Connecticut, nuclear power consumption zeroed out during 1997 due to the plant shutdowns. In response, petroleum consumption rose to 55% and imported electricity supplied 18% of all energy. In 2000, nuclear power consumption rose to 20% in Connecticut, nearly reaching the 26% attained in 1995 before plant shutdowns.

Figure 2-11
CT vs. US Energy Consumption, by Source, 2000

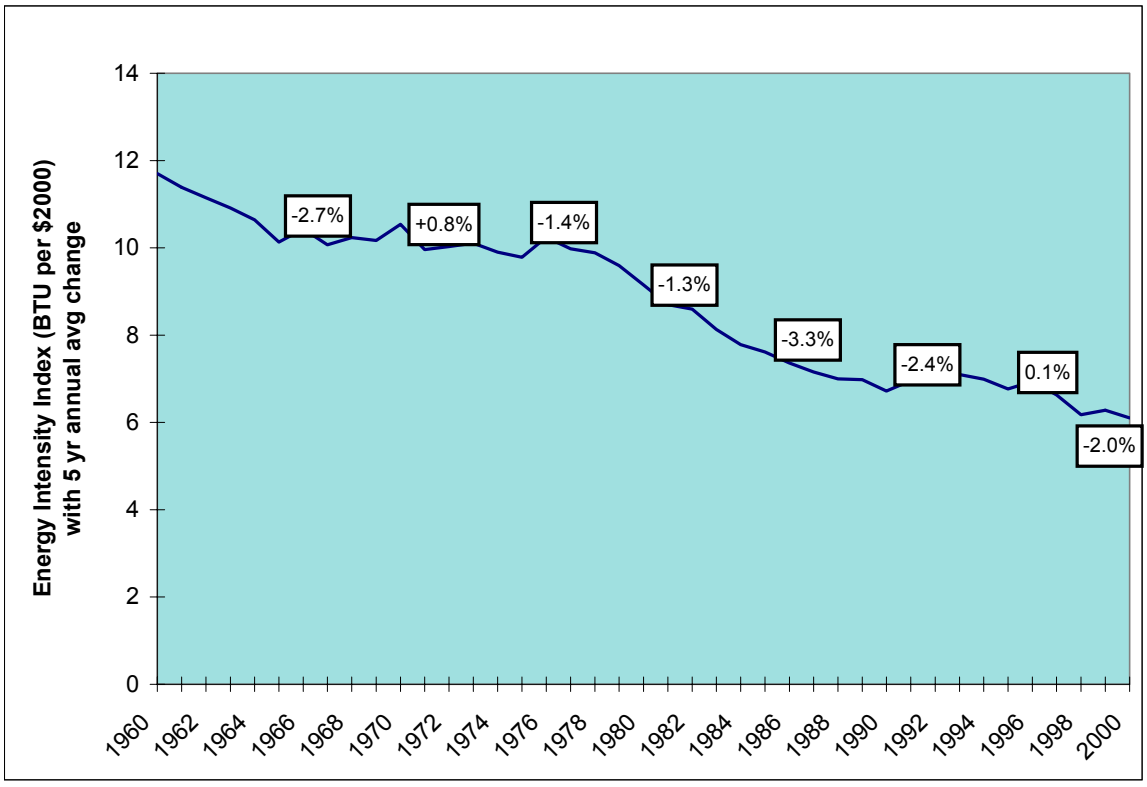


Additional Energy Measures

Benchmarking Energy Intensity and Efficiency

In 1995, the "State of Connecticut Goals and Benchmarks" established a benchmark Energy Intensity Index, with an objective to "reduce Connecticut's energy intensity (BTU/dollar of personal income) by 2.5% per year or over 40% over the next 20 years."[9] The benchmark measures the pace of increased efficiency in the use of energy in Connecticut as measured by the amount of energy needed to yield a dollar of personal income. Figure 2-12 shows the performance for this benchmark over the period 1960 through 2000. From 1981 through 2000, the average annual reduction in energy intensity was 1.6%, a figure approaching the 2.5% target. However, from 1991 through 2000, there was much slower improvement -- an average of only 1.0%, due in part to relatively low energy prices.

Figure 2-12
Connecticut Energy Intensity Index Benchmark



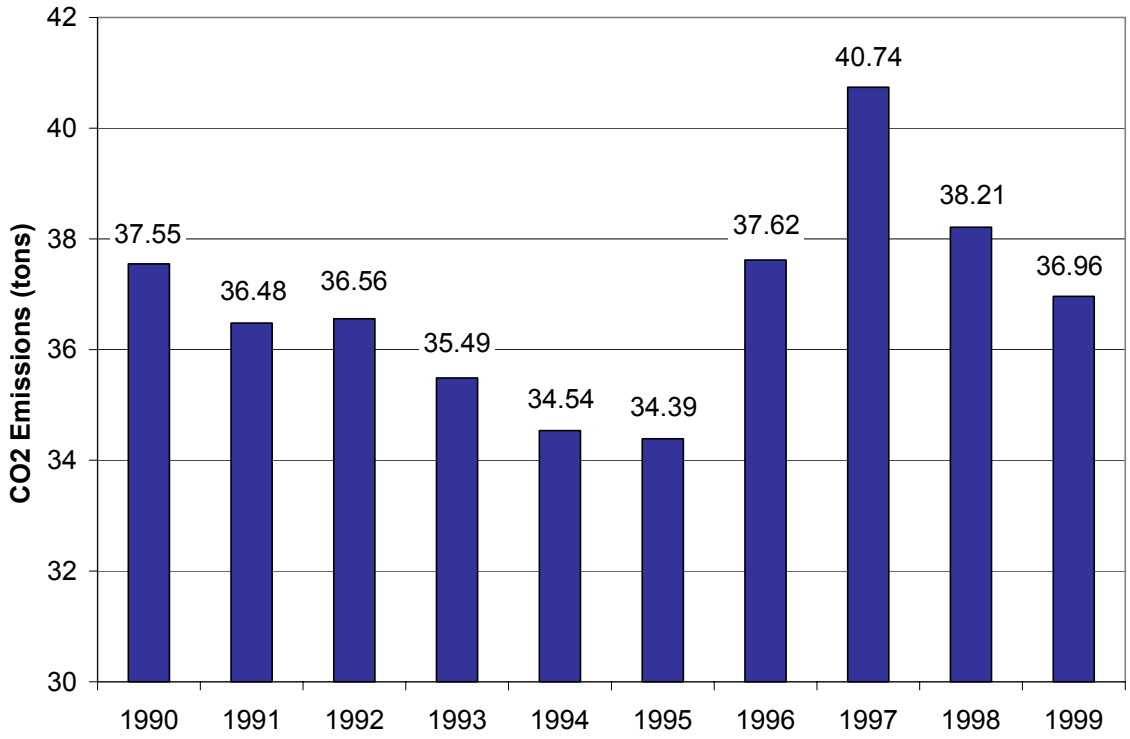
[9] Connecticut Progress Council, page 111.

Tracking Greenhouse Gas Emissions

Figure 2-13 tracks the CO2 emissions from Connecticut between 1990 and 1999. The 1999 level of emissions is 3.3% less than the 1998 figure, and 1.6% less than in 1990, when these calculations were first performed for Connecticut. (Note: Needs 2000-2001 updates.)

For the period 1996-1997, the increased reliance on petroleum, primarily due to the outage at the Millstone nuclear plants, appears to have interrupted the downward trend in emissions of the early 1990s. The re-starting of the Millstone nuclear units and petroleum usage decrease led to CO2 emissions trending downwards again starting in 1998.

Figure 2-13
CO2 Emissions in CT

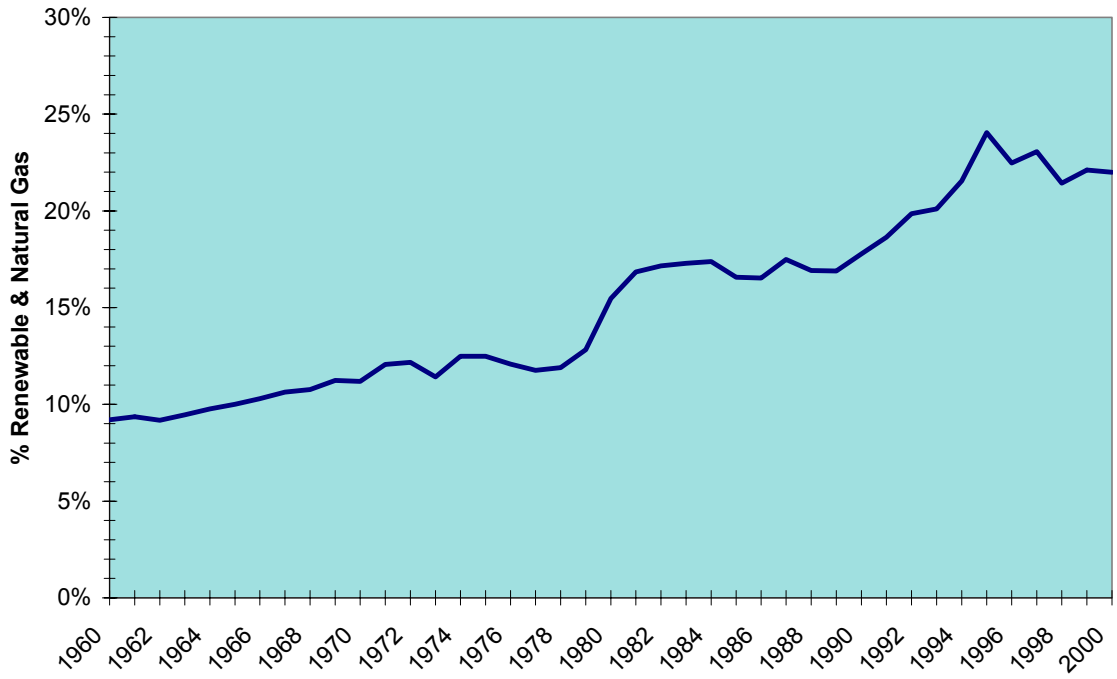


Benchmarking the Use of Cleaner Power Sources

The 1995 “Connecticut Goals & Benchmarks” report designates another energy benchmark that tracks the change in the state fuel mix, as measured by the percent of Connecticut's energy generated from natural gas and renewable energy sources. The data is derived from EIA's SEDR database with renewable energy resources primarily consisting of hydropower and biomass, as well as municipal solid waste used for power generation.

As the report states "successful implementation of renewable resources will benefit environmental quality, energy security, and economic competitiveness". The benchmark has risen more quickly since the late 1970's, as new small gas-fired cogeneration and renewable power projects were developed with federal tax credits and the support of the federal PURPA law and associated state regulatory policies. As noted above, it is expected that natural gas will rapidly increase its share of power sources in New England, so this benchmark should be able to increase as well.

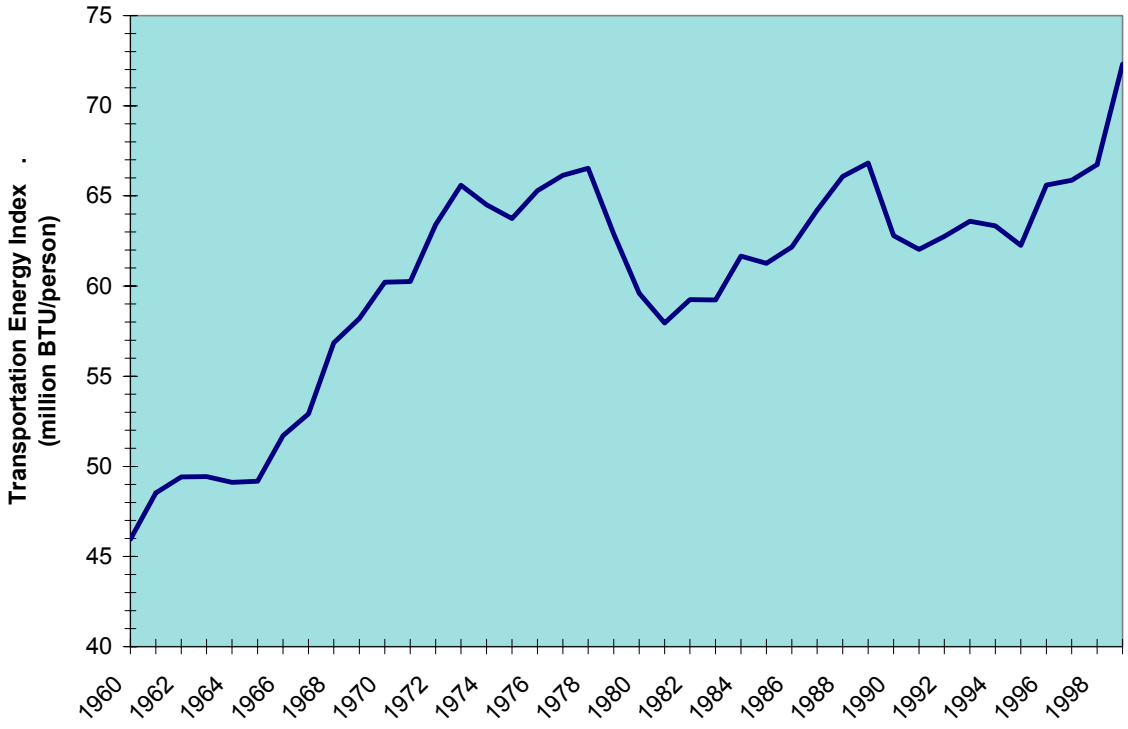
Figure 2-14
A Cleaner Power Source Benchmark



A Transportation Energy Benchmark

The final energy benchmark summarized in Figure 2-15 is a transportation energy index which measures per capita consumption of energy in the transportation sector. Data sources include SEDR data as well as population information from the Census Bureau. This benchmark provides insight into the overall efficiency and usage patterns of the transportation sector, which is heavily reliant on imported oil. Notice the steady rise of the index until the late 1970's oil crisis, followed by a sharp drop due to the development of fuel efficient vehicles, heightened energy conservation and a change in economic conditions. Since then, the index has generally risen, excluding the steep one-year drop in 1989.

Figure 2-15
Transportation Energy Benchmark



2.2 Factors Influencing Future Supply, Demand and Costs

Although difficult to predict, many factors may converge to directly impact energy supply, demand and costs, as noted below.

Factors that may influence energy supply include:

- Siting ease for generation, transmission and pipeline projects
- Unanticipated shutdown of generating facilities
- Natural gas production in the U.S. and Canada

Factors that may influence energy demand include:

- Energy pricing
- Overall economic conditions
- Fuel availability

Factors that may influence energy costs include:

- Adequacy of energy supply
- Natural gas pipeline capacity availability
- Adequacy of gas storage
- Futures markets
- Seasonal energy demand (e.g. unusually hot or cold weather)
- Changes to deregulated electric market structure
- Locational Marginal Pricing (LMP) costs
- Overall economic conditions

3. Progress toward Long Term Goals from Previous Plan

This section, as required by PA 03-135, reviews progress from the previous report of the Board , "The Energy Policy Report of the Connecticut Advisory Board," February 1, 2002 define as ("2000 Energy Report") and used defined term throughout. This report contained 15 major policy strategies. This chapter reviews progress toward each of these strategies and identifies outstanding issues to address going forward.

3.1 Monitor Retail Energy Market Developments and Default Service Options

Recommendation

In the previous report, the State of Connecticut Energy Advisory Board ("Board") recommended that it be the policy of the state to continue monitoring and studying the progress of existing electric restructuring policies. The state should take any necessary steps to increase competition in the retail energy market and to ensure that all customers have access to reasonably priced electricity supply options, either through competitive supply or standard offer service, after February 31, 2006 the end of the transitional standard offer as currently defined by statute. Increased competition could be facilitated through increased customer education campaigns, or through the minimum level of streamlined regulation required to assure full and fair competition and to meet other energy policy goals.

Progress to Date

Connecticut restructured its electric utility industry under Public Act 98-28 that created a competitive market effective January 1, 2000. A major revision to Public Act 98-28, Public Act 03-135, was signed by Gov. Rowland in June 2003 and includes the following provisions:

- Requires electric companies to provide "transitional standard offer service" from 2004 to the end of 2006 to customers who do not choose a competitive supplier;
- Allows base rates to rise from 2004-2006, but not to exceed rates that were in effect on December 31, 1996 (about 10% above current levels);
- Allows distribution companies to charge a half mill procurement fee on every kWh procured for default service and recover administrative costs of providing transitional standard offer service.
- After the extended transition period, the Department of Public Utility Control ("DPUC") must set rules for default pricing that reflects the full cost of providing the electricity on a monthly basis.

- Requires the DPUC to conduct a study of the state of competition in the retail electric market. The DPUC must begin the study by July 1, 2005, and submit its final decision to the Energy and Technology Committee by January 1, 2006.

Outstanding Issues

Retail competition among all classes of customers in Connecticut has been slow to develop, and as of July 2003, roughly 1.5% of load was competitively supplied. As detailed above in Public Act 03-135, the DPUC will study the state of competition in the retail electric market, and the results will give the State a clearer picture of steps needed to support and encourage retail competition. Increased switching may get an assist from Public Act 03-135, and it will important for the State to monitor and facilitate competitive retail energy market development Retail competition, especially use of renewables/ green power could be easily developed if one or both of the wires companies, UI and CL&P, offered such products. CL&Ps sister, Select Energy, offers these products in NY and they have been well received.

After the current period of transitional standard offer service expires in 2006, it will be critical that consumers receive fairly-priced electric supply service, either through competitive supply or through standard offer service. According to Public Act 03-135, the DPUC must set rules for default pricing that reflects the full cost of providing the electricity on a monthly basis.

3.2 Encourage Interstate and Federal Action to Enhance Regional Market Development

Recommendation

The Board recommended that the state closely monitor federal and regional electricity market activity, support initiatives to increase the role of states in regional electricity market decision-making, and work with other states, Independent System Operators, transmission owners, and others to further Connecticut's energy policy goals.

Progress to Date

Since publication of the Board's Energy Policy Report in February 2000, significant activity has occurred at the regional and federal levels to enhance and stimulate regional market development. At the federal level, in its landmark Order 2000, the Federal Energy Regulatory Commission called for regional consolidation and the formation of Regional Transmission Organizations (RTOs) throughout the country. FERC's July 31, 2002 Standard Market Design Notice of Proposed Rulemaking (SMD NOPR) changed the emphasis from consolidation to standardization. In response, ISO New England (ISO-NE) has worked toward implementation

of SMD, while also pursuing formation of an RTO. Connecticut has undertaken a role in this process by participating in the RTO New England working group and planning process. Refer to NEDRI [New England Demand Response Initiative] that was completed during 2003. See www.raabassociates.org, then click on NEDRI button in lower right of page. NEDRI was supported by DOE and EPA and FERC actively participated.

Outstanding Issues

As ISO-NE continues its evolution in response to FERC's call for regional standardization and consolidation, the State will need to continue to stay active in the process to ensure that wholesale electricity market developments are consistent with State objectives and in the public interest. Key concerns include reliability, cost impacts (e.g., cost shifting), and infrastructure development. Further discussion is provided in Chapter 7 of this report.

3.3 Remove Barriers To Distributed Generation

Recommendation

The Board recommended that it be the policy of the state to continue efforts to remove economic, market, and regulatory barriers to distributed generation (DG) development.

Progress to Date

Since publication of the Board's Energy Policy Report in February 2000, DG has been a topic of considerable attention for Connecticut state legislators, regulators, and Governor Rowland. In light of reliability concerns associated with transmission constraints and load pockets, particularly in the southwestern part of the State, distributed generation has been promoted as a viable alternative to developing new transmission capacity. The following actions have all occurred since issuance of the Board's 2000 report:

- The State's Renewable Portfolio Standard (RPS) has been expanded to make certain types of DG technologies eligible for the RPS requirement. (SB No. 733, Public Act No. 03-135, Section 7)
- Electricity suppliers are now required to provide a credit to their residential customers who generate electricity from a Class I renewable resource or hydropower. In effect, the law requires the suppliers to run a customer's electric meter backwards for the power produced using those resources. PA 03-135 extends this requirement to utilities in their provision of transitional standard offer, standard, and backup services. Under current law, such net-metered customers must pay two charges based on the power they consume, without deducting any electricity they produce. These charges are used to pay for public policy costs and the utility's stranded costs. The bill exempts from this

provision customers who generate electricity from a unit that has a capacity of up to 10 kilowatts. (SB No. 733, Public Act No. 03-135, Section 3)

- The Department of Public Utilities Commission (DPUC) is required to initiate a proceeding to examine the standardization of interconnection protocols for engineering methods and rates. Among other things, such protocols establish technical requirements for small power generators who wish to connect to the transmission grid. Furthermore, if the Institute of Electrical and Electronic Engineers has adopted such protocols, the DPUC must also adopt them. The bill also requires municipal utilities to establish, by October 1, 2004, rates for connecting generation facilities in their territories that begin operation after the bill's passage with the utilities' transmission and distribution systems. The municipal utilities must consult with the Connecticut Municipal Electric Energy Cooperative in developing these rates. (SB 733 of 2003, Public Act No. 03-135, Sections 16 & 18)
- Governor Rowland's Executive Order 26, issued in April 2002, raised critical questions about current energy planning and management, including the necessity and benefits of transmission projects, technology alternatives to transmission expansion, and the effects of cumulative crossings of Long Island Sound. In response, Public Act 02-95, enacted in June 2002, established a Working Group and Task Force to evaluate alternatives, including load response, distributed generation, and conservation.
- The Institute for Sustainable Energy at Eastern Connecticut State University prepared "An Assessment and Report of Distributed Generation Opportunities in Southwest Connecticut (SW CT)" to evaluate the potential of distributed generation to mitigate transmission problems in SW CT. The report outlines anticipated problems with transmission and generation shortfalls in SW CT, and encourages distribution companies, with the assistance of public funds such as the Clean Energy Fund, to participate in demonstration projects involving the interconnection of clean DG, such as fuel cells, with the distribution system. It also urges the Legislature to consider giving incentives to electricity consumers that employ onsite, clean DG and to further consider permitting electric distribution companies to install and operate, in the very limited scenario of a reliability emergency, clean DG or other emergency generators. (Note: to be updated w/info from RMI.)

Outstanding Issues

Despite the potential benefits of more widespread DG development, DG has been slow to gain a firm foothold in commercial and industrial energy markets. Even in regions like SW CT, where DG could provide potential relief to significant electricity T&D constraints, DG has not been widely adopted. Frequently noted barriers include: zoning and permitting processes, high standby charges for backup power, charges for utility stranded cost recovery, lack of commercial availability of certain DG technologies, emissions concerns, and noise and other siting constraints. Addressing these barriers will be a key objective of any new policy initiatives to further promote DG in Connecticut.

3.4 Support Emerging and Renewable Energy Technologies

Recommendation

The Board recommended that it be the policy of the state to encourage and support emerging and renewable energy technologies through the development of new policy goals and financial assistance programs, as well as through further assessment and evolution of existing goals and programs.

Progress to Date

The state of Connecticut has untapped renewable energy technology potential success as solar, hydro, new fuel cells and possible offshore wind. Developing renewable energy and other emerging technologies will both promote existing state policies as well as provide the state with benefits related to environmental improvement, economic development, and increased energy security. In addition, emerging and renewable energy development can help Connecticut meet objectives related to increased electricity reliability, reduced congestion, and reduced energy costs.

Since the last "Energy Policy Report" of the Board, the state has taken a number of steps to further its support for emerging and renewable energy technologies. The following changes have all occurred as a result of modifications to the State's original electricity restructuring legislation, Substitute Senate Bill No. 733, Public Act No. 03-135, *An Act Concerning Revisions to the Electric Restructuring Legislation*, approved June 26, 2003:

- The State's Renewable Portfolio Standard (RPS) has been expanded to include electricity suppliers providing standard offer, transitional standard offer, standard service, or back-up electric generation. (Section 7)
- The RPS now requires that 10% of all retail electricity sales come from renewable resources by 2010. In addition, ocean thermal power, wave or tidal power, low emission advanced renewable energy conversion technologies, and new run-of-the-river hydropower with a generating capacity of not more than 5 MW are considered Class I renewables. Air emissions limits now apply to biomass-derived energy. (Section 7)
- The RPS now requires any electric distribution company providing transitional standard offer service, standard service, supplier of last resort service, or back-up electric generation service to enter into one or more long-term power purchase contracts from Class I renewable energy source projects that receive funding from the Clean Energy Fund. (Section 7)
- Regarding information disclosure, suppliers must now provide information regarding the economic and environmental characteristics of their services to the DPUC, which must maintain the information and provide it to consumers on request. The bill extends these

requirements to utilities in their provision of backup and standard service. The information must include the company's rates and charges; the terms and conditions of its contract; the proportion of its power that comes from nuclear, fossil fuel, and renewable resources; emissions of various pollutants from its power plants; and records of customer complaints and their disposition. (Section 5)

- Regarding net metering, suppliers must provide a credit to their residential customers who generate electricity from a Class I renewable resource or hydropower. In effect, the law requires the suppliers to run a customer's electric meter backwards for the power produced using those resources. The bill extends this requirement to utilities in their provision of transitional standard offer, standard, and backup services. Under current law, such net-metered customers must pay two charges based on the power they consume, without deducting any electricity they produce. These charges are used to pay for public policy costs and the utility's stranded costs. The bill exempts from this provision customers who generate electricity from a unit that has a capacity of up to 10 kilowatts. (Section 3)

Outstanding Issues

As the State seeks to fulfill the Board's renewable energy recommendations, close monitoring of the RPS implementation process will be of particular importance. Key issues include ensuring an adequate supply of renewable energy for purposes of complying with the RPS; provision of consistent support of renewable energy research and development; maintaining consistent funding and providing technical assistance for renewable energy project development; and development of a generation information system (GIS) to support trading of renewable energy credits.

3.5 Protect the interests of all customers

Recommendation:

In the context of recent electric restructuring activities, it was recommended in the previous plan that it be the policy of the state to protect all customers, particularly low-income customers within the framework of the restructured market.

Progress to Date:

There are a number of programs available to low income customer in Connecticut to help them save on their energy bills.

Both of the major electric utilities offer low-income energy efficiency services to their customers. For example see:

Connecticut Light & Power's low-income energy efficiency programs
United Illuminating's low-income "Operation Fuel" program

The natural gas companies also provide services to save low-income customers money examples include:

Low-Income Rate Assistance

All gas public service companies are required by statute to operate an arrearage forgiveness program for gas heating customers. Arrearages are forgiven if customer makes regular payments. Eligibility criteria include: arrears of $100 or more that are 60+ days overdue, income of less than 200% FPG, and have had at least $25 paid toward bill by LIHEAP (or other assistance program). Electric utilities have voluntary arrearage forgiveness as part of budget programs.

Outstanding Issues:

Services are available to lower low-income customer's bills. The state should ensure that these programs remain in place. Better coordination of these programs may be warranted.

3.6 Support and Coordinate Energy Conservation and Efficiency Programs

Recommendation

Energy conservation is a cornerstone of past and present state energy policy, and the support for a 'conservation ethic' emphasizing increased energy efficiency will bring the state closer to meeting its energy goals. The recent maximum achieves potential study just completed for the CT ECMB illustrates that there is still significant energy efficiency potential in the state. Thus the Board recommended that it be the policy of the state to support and coordinate the efficiency programs authorized in the Restructuring Act.

Progress To Date

A number of key events have occurred in the past few years that indicate progress towards goals established in the original 'Energy Policy Report.'

- Investor-owned electric utilities have made significant progress towards delivering consistent programs to customers statewide. Over one-half of the programs being operated by CL&P and UI, respectively, are now being jointly delivered. In addition, these programs have cooperatively branded with federal programs, such as Energy Star, where possible.
- Initiatives have focused their resources on the Southwest Connecticut region, as recommended by the Energy Conservation Management Board.
- A better coordination of public education campaign on the benefits of the C&LM funds and the Clean Energy funds.

One major source of concern for the Conservation and Load Management (C&LM) programs is the establishment of consistent funding levels. Two legislative acts by shifted money to the general fund thereby disrupting the delivery of and planning for energy efficiency programs in 2002-2003. Public Act 01-9, Section 13 was approved in June 2001 and withdrew a total of $12.0 million in 2002 C&LM funds. Public Act 03-6 was approved in June 2003 and withdrew the entire annual funding for the 2003-2004 C&LM programs. Securitization of bonds backed by electric utility revenues was instituted to partially restore funding levels.

Outstanding Issues

Several key issues remain to be addressed from the original 'Energy Policy Report'.

- The development of energy efficiency services for customers of natural gas utilities and oil, propane and municipal energy providers in coordination with the development of services for electric utility customers under the Restructuring Act.
- The coordination of low-income programs with existing state programs that already serve these customers, as recommended by the Energy Conservation Management Board in their 2003 report.

3.7 Review Tax Incentives for Energy Efficiency and Clean Energy

Recommendation

The Board recommended that it be the policy of the state to review existing and potential tax incentives in order to identify opportunities to increase the existing incentive levels and extend tax incentives to additional taxpayers, equipment and energy applications with significant economic, environmental or risk mitigation benefits.

Progress To Date

There have been no studies conducted to review or modify policies with regards to energy taxation.

Outstanding Issues

The study of energy taxation policies is an important first step in this policy strategy. The recommendations resulting from such a study should yield strategies to modify tax incentives in order to promote energy efficiency. In parallel, federal tax initiatives that may be included in the upcoming national energy plan should be monitored.

3.8 Enhance Regional Supply Portfolio Diversity

Recommendation

Connecticut statuatory energy policy recommends that the state diversify its energy supply mix. The Board recommends that it be the policy of the State to place a priority on maintaining an adequate level of fuel diversity by monitoring fuel use patterns. The Board further recommends strategies to encourage the development of new energy technologies, which will displace the use of fossil fuels. The Board recommended that the state carry out strategies that will spur the development and implementation of renewable energy technologies and resources that are substantially underrepresented in the state's energy portfolio. This should be accomplished through the development of new policy goals and financial assistance programs, as well as through further assessment and evolution of existing goals and programs.

Progress to Date

In response to low cost natural gas in the second half of the 1990s, continued turbine technology improvements, new supply sources from Atlantic Canada, and increasingly stringent environmental emissions restrictions, natural gas in recent years became the fuel of choice for new generation throughout New England including Connecticut.

Since the "2000 Energy Policy Report"; a number of new natural gas powered electric generation facilities have come on line in Connecticut and others are still planned. With these new facilities coming on line, the State's fuel mix will change substantially over the next couple of years from a more diverse mix to a less diverse mix. Most significant will be an increase in the use of natural gas for electric generation from the 24% use of natural gas in 2002 to the 47% use of natural gas predicted for 2011. This will make Connecticut more susceptible to price spikes related to fluctuations in the natural gas market, which is ultimately passed on in retail rates for electricity.

The original electric restructuring legislation did give the Connecticut Siting Council more latitude in making decisions regarding the permitting approval for electric generation facilities. Their jurisdiction and statutory decision criteria have been modified to provide uniform treatment between utilities and private power producers so that a full range of environmental and economic effects can be appropriately considered for new generation facilities. This would include the ability to consider the economic impact of choice of the fuel supply to power the facility.

In addition, since the last "Energy Policy Report" of the Board, the state has taken a number of steps to further its support for emerging and renewable energy technologies. Changes occurred as a result of modifications to the State's original electricity restructuring legislation, Substitute Senate Bill No. 733, Public Act No. 03-135, *An Act Concerning Revisions to the Electric Restructuring Legislation*, approved June 26, 2003. See section 4.d. for a listing of these changes.

Outstanding Issues

As the State seeks to fulfill the Board's recommendations to enhance the regional portfolio diversity, the State should continue to review the reliability of the state's energy portfolio and develop steps to mitigate portfolio risk, monitor the actual impact of the implementation of the revised Renewable Portfolio Standards, increase programs and funding for demonstrating and using under-represented energy resources, including the development of renewable energy projects including in fuel cells (powered by renewable fuels), biomass, hydro, wind and solar, and better educate the public regarding green power and clean energy. Fuel diversity is also important from a Homeland Security perspective.

3.9 Assess Natural Gas Restructuring

Recommendation

The Board recommends that it be the policy of the state to continue to assess the possible benefits and drawbacks to further introduction of gas choice to residential customers. In addition, there are several recommendations the Board advocates the state consider pursuing based on recent ISO-NE gas policy recommendations, which are detailed below.

Progress to Date

Since customer choice began for C&I gas customers in April 1996, there has been one primary docket to address pipeline capacity and reliability issues (97-07-11), with minimal state legislative activity to open gas choice to residential customers. In the last three years, several Public Acts have been promulgated to address specific gas supply, capacity and reporting

issues. Efforts to improve and standardize existing deregulated procedures have been the focus of several key studies.
Three recent studies have assessed the existing and potential natural gas resources in Connecticut, as well as examined capacity issues confronting the state:

- ISO New England recently conducted a two-phased assessment of regional pipeline delivery capacity. This analysis has been reviewed by the Connecticut Siting Council, which indicated support of the recommendations reported by ISO-NE. ISO New England Steady-State and Transient Analysis of New England's Interstate Pipeline Delivery Capability, 2001-2005
- Connecticut Siting Council Review of the Connecticut Electric Utilities' Ten-Year Forecasts of Loads and Resources (2002)
- Office of Policy Management's FY 2003-04 report to the governor assessing resources (see pages 48—51)

In the past three years, there has been legislative activity to address four primary gas industry issues:

- Public Act 03-27, effective October 1, 2003, was enacted to clarify specific gas supplier registration requirements. This law specifies that a gas supplier must provide the DPUC with updated registration information by July 15 each year. The measure also requires that the supplier maintain a bond of security for at least the period specified by DPUC. By law, the registrant must also (1) have a contract with one or more gas suppliers (2) comply with the National labor Relations Act and Connecticut Unfair Trade Practices Act, (3) agree to cooperate with DPUC and other gas industry entities in the case of an emergency, and (4) pay an annual registration fee. Under the bill, if a supplier fails to comply with any of these requirements, DPUC must notify it that its registration expires on September 30 and that it will no longer be allowed to sell gas.
- Public Act 02-16, effective October 1, 2002, requires that gas company forecasts of supply and demand cover a five-year, rather than the previously required 10-year period. By law, the companies must submit the forecasts in a report to the Department of Public Utility Control by October 1 of each even-numbered year.
- Public Act 02-04 (Section 9) clarifies what specific state taxes on the gross income of gas distribution companies are allowable.
- Collaborative processes have addressed many of the outstanding issues associated with gas unbundling including subsidization of a firm gas customers and suppliers of last resort.

Outstanding Issues

Based on a review of pipeline delivery capacity by the ISO-NE and the Connecticut Siting Council's review of outstanding challenges in the state's natural gas industry, several strategies should be considered by the state:

- Assess the possible benefits and drawbacks to further introduction of gas choice to residential customers
- Examine Supplier of Last Resort (SOLR) services (which are currently provided by local gas distribution companies through 2005) and a determine SOLR alternatives for the competitive C&I market to address not only supply provisions going forward, but also long term/supply capacity planning activities. This is currently ongoing.
- Determine whether to pursue certification of each supplier's transportation arrangements; investigate of the need to establish safeguards to ensure that gas-fired merchant generators are not the primary source of winter operating reserves.
- Require of certification of plant back-up fuel capabilities to help mitigate the potential for short-term disruptions in power supplies during extreme weather events.
- Develop and implement of standards for coordinating competitive natural gas supply delivery to customers in order for ISO schedulers to be aware in real-time of contingency events on pipelines serving merchant generators.
- Streamline and standardize federal and state regulations for requirements established in tariffs, terms and conditions and gas transaction standards.

3.10 Support Adequate Levels of Fuel Storage

Recommendation

The 1993 Preliminary Draft for Public Comment of the Connecticut Comprehensive Energy Plan recommended that OPM "work with industry groups and on a regional basis to assess the adequacy of petroleum product storage facilities ... in conjunction with its review of energy emergency procedures." (11/29/93, pp. 44-45) The Board recommends that the results of this work be reviewed, and that the projected adequacy of in-state fuel storage be assessed (preferably in conjunction with ISO-NE and energy agencies in other NE states) for all fuels, including natural gas and other forms of gas supply as well as petroleum, in the context of projected use of interruptible gas for power generation, additions to pipeline capacity and changes in pipeline pricing and other energy market changes. If this review identifies any

significant concerns about the risks of supply or price disruption, the Board recommended that it be the policy of the state to develop appropriate recommendations to mitigate such risks.

Progress to Date

The review as described above has not yet been conducted, and no additional research on this issue has been conducted since the previous Connecticut Energy Plan was completed in 2000.

Outstanding Issues

In the last decade, storage levels are increasingly driven by price, such that inventory is only held when necessary. While this issue remains important, is not as critical as in 1993 when the Preliminary Draft of the Energy Plan was completed. Thus, the State should continue to monitor fuel storage levels and issues, as necessary, to ensure adequate supply and to remove any counter-productive or unnecessary barriers that would otherwise impede the development of adequate levels of fuel storage. Key issues include maintaining adequate security of all fuel storage facilities and developing recommendations to mitigate any risks of supply or price disruption. Thus in this area should be coordinated with Homeland Security efforts.

3.11 Coordinate Environmental and Energy Policies

Recommendation

In the previous report the Board recommended: that it be the policy of the state to continue to develop effective regulations that are consistent with energy policy goals and with new trends in energy markets and technology, to cost-effectively comply with the Clean Air Act and to further reduce air and other environmental impacts to protect the health of Connecticut residents.

Progress to Date

There have been a number of coordinated efforts related to energy and environmental policies in Connecticut since the issuance of the previous report. Specific examples include:

Climate Change - Leading by Example: Connecticut Collaboratives to Reduce Greenhouse Gas Emissions, prepared by the Governor's Steering Committee
http://www.rbf.org/publications/sus.html

Connecticut Climate Change Stakeholder Dialogue: http://www.ccap.org/m-proj-CT-CCSD.htm

Climate Change Roadmap for Connecticut, prepared by Environment Northeast
http://www.cleanenergyfunds.org/CaseStudies/ENV_NE_Climate_Change_Roadmap_Part_I.pdf

Outstanding Issues

Coordination, particularly in areas such as climate change should continue. The RTO planning process may also have environmental impacts and should be monitored.

3.12 Prioritize Energy Use in Transportation and Land Use

Recommendation

As effective transportation and land use planning can have a significant effect in mitigating energy use, the Board recommended that policies and programs be further developed and carried out that aim to reduce energy use in transportation and land use.

Progress to Date

Since the last "Energy Policy Report," Public Act 01-6, "An Act Concerning Fuel Cell Technology Standards" was enacted, which exempts sales tax on materials, tools, fuel, machinery and equipment used in fuel cell manufacturing in Connecticut.

In addition, at the federal level, the President signed an order instituting CAFÉ standards for light trucks of 22.5MPG by 2008.

The state has supported vanpooling under its Easy Streets Program.

Outstanding Issues

As the State seeks to fulfill the Board's strategy to prioritize energy use in transportation and land use, the State should promote programs to reduce vehicle miles traveled, land use policies to curtail sprawl, and educate consumers on the need to participate in activities to reduce vehicle miles traveled and to practice to reduce the pollution impact of their automobiles.

3.13 Stimulate Commercialization of High Mileage and Alternative Fuel Vehicles

Recommendation

The use of fuel-efficient alternative transportation vehicles – including hybrid vehicles --will have a great impact on reducing the use of fossil fuels, improving the State's air quality, and increasing fuel diversity. For this reason, the Board recommended the adoption of policies aimed at reducing fuel consumption in the State's transportation sector by encouraging the use

of fuel-efficient, alternative fuel and hybrid vehicles. Make sure you define “hybrid”. This can be “flexible fuel” , as defined by DOE, which simply means it can be fueled by ethanol and gasoline. Hybrid-electric vehicles is the correct technical term for reference to Honda Civic, Toyota Prius, et al.

Progress to Date

Since the last “Energy Policy Report,” Public Act 01-6, “An Act Concerning Fuel Cell Technology Standards” was enacted, which exempts sales tax on materials, tools, fuel, machinery and equipment used in fuel cell manufacturing in Connecticut.

In addition, at the federal level, the President signed an order instituting CAFÉ standards for light trucks of 22.5MPG by 2008.

New Britain is currently in the process of reducing diesel fuel in buses.

Outstanding Issues

To meet the Board’s goal of stimulating the commercialization and use of high mileage and alternative fuel vehicles, the State should promote the development of hydrogen economy research and demonstration program, continue to develop tax and regulatory incentives to stimulate the development and use of these vehicles, establish fleet procurement rules to mandate the State purchase low emission, hybrid and alternative fuel vehicles and educate the general public about the benefits of purchasing these vehicles.

3.14 Initiate a Coordinated Energy Education Campaign

Recommendation

Most of the energy policies articulated in this report will be advanced substantially if all citizens take actions to conserve energy, purchase green power and increase the overall sustainability of their actions. To this end, the Board recommended the development of a coordinated energy education campaign to raise awareness and increase individual actions to achieve the goals of this report.

Progress to Date

The State did carry out a campaign, the Consumer Education Outreach Program, to educate citizens on electric restructuring. However, there has been no effort to date to develop and implement a more comprehensive program to educate Connecticut citizens regarding energy efficiency, energy diversity, the reduction of greenhouse gas emissions, green power, renewable energy or other energy sustainability issues. PA 03-135 required the restart of such

a program. SmartPower is specifically working on education of renewable energy issues. See www.smartpower.org and/or talk with Brian Keane.

- The ECMB and Clean Energy fund should focus future offers on public education and awareness of energy use and impacts to reach more citizens.

Outstanding Issues

In an effort to meet the Board's goal of creating and implementing a public education campaign related to energy sustainability issues, the State should authorize resources for Connecticut Institute of Sustainable Energy to carry out this activity.

3.15 Establish and Coordinate Ongoing Energy Planning Review Process

Recommendation

In the previous plan, the Board recommended that one lead agency, in conjunction with representatives from agencies with energy-related responsibilities, be established to provide a venue for discussion and recommendations regarding the interactions between those agencies when they have significant energy policy implications.

Progress to Date

No process was made on this strategy since the previous plan.

Outstanding Issues

Coordination of energy issues across multiple agencies still remains an important issue.

4. Recommendations for Reducing Dependence on Fossil Fuels

Connecticut, like much of the Northeast, is more dependent on fossil fuels than most regions of the country. This section specifically deals with strategies and actions to reduce dependency on fossil fuel. In order to reduce fossil fuels the Board recommends the following strategies:

- Continue to support energy efficiency
- Support renewable energy technologies
- Increase penetration of DG and CHP
- Support demand resource programs
- Support transportation and land use policies that reduce energy use
- Develop a Hydrogen Infrastructure Research Agenda

Each of these is described below.

4.1 Strategy: Continue to Support Energy Efficiency Programs

Energy conservation is a cornerstone of past and present state energy policy, and the support for a 'conservation ethic' emphasizing increased energy efficiency will bring the state closer to meeting its energy goals. Connecticut statutory energy policy calls for conserving energy resources by avoiding unnecessary and wasteful consumption and consuming energy resources in the most efficient manner feasible. Listed below are recommendations regarding strategies to promote energy efficiency utilizing programs and taxation policies.

Examples of Possible Actions

- Ensure full funding of energy efficiency and renewable energy programs.[maintain funding at least at existing levels w/o earmarks to close budget. EE returns pay off several times and create jobs for CT.
- Study energy taxation policies to meet established energy goals.
- Develop a comprehensive approach to electric and gas utility performance incentives to encourage energy efficiency and renewable energy utilization by all energy consumers.
- Explore and encourage the development of a conservation and efficiency industry in the state using public/private partnerships.

- Continue the focus of CL&M resources in the Southwest Connecticut region in order to stimulate greater energy savings in this target area.
- Periodically upgrade building codes and appliance standards in conjunction with national initiatives and assure that adequate mechanisms exist to enforce code compliance.
- Coordinate low-income programs with existing state programs that already serve these customers.
- Provide stronger, more direct incentives through corporate and individual income tax credits to encourage and induce business and individual taxpayers to purchase the most energy-efficient lighting, heating, insulation, thermostat, air-conditioning, refrigeration and motor technologies that are readily available.
- Assess the reestablishment of a sales tax exemption for renewables and the corporate tax exemption for research, design, manufacture, sale or installation of alternative energy systems (such as combined heat and power or fuel cell systems) or alternative motor vehicles in terms of need and fiscal impacts.
- Consider corporate income tax exemptions for commercial buildings that exceed building codes by a specified amount, earn an Energy Star Buildings label, or are certified by the Leadership in Energy and Environmental Design (LEED) program as a “green” building.

4.2 Strategy: Support Renewable Energy Technologies

The state of Connecticut has significant untapped renewable energy technology potential. Developing renewable energy and other emerging technologies will not only promote several existing state policies but will provide the state with benefits related to environmental improvement, economic development, and increased energy security. In addition emerging and renewable energy development can help Connecticut meet objectives related to increased electricity reliability, reduced congestion, and reduce energy costs.

The Board recommends that it be the policy of the state to encourage and support emerging and renewable energy technologies through the development of new policy goals and financial assistance programs, as well as through further assessment and evolution of existing goals and programs.

Examples of Possible Actions

- Monitor and evaluate development and implementation of renewable energy and distributed generation (DG) technologies in Connecticut. Expand the state’s presence in research and development for renewable energy and emerging DG technologies.

- Support Connecticut Innovations Incorporated (CII) in administering the Renewable Energy Investment Fund. Ensure consistent funding for renewable energy and DG at 2002 levels. Consider additional technical and financial assistance as needed to support renewable energy and emerging DG technologies and development projects.
- Collaborate with the renewable energy community to make sure that adequate supply exists to meet demands created by the RPS, and support policy options for achieving this outcome (e.g., efforts to develop long term renewable energy credit contracts).
- Examine how other states/regions have set up incentive structures for renewable energy and emerging DG technologies, and evaluate the applicability and benefits of these to the state of Connecticut. Insofar as possible, develop and institutionalize funding mechanisms, such as low interest loans, capital cost buy-downs, and tax benefits to support renewable energy and DG development. Examples of the latter include sales tax exemptions, accelerated depreciation schedules, and various tax deductions.
- Promote environmental initiatives and pollution prevention mechanisms with renewable energy and DG solutions that help reduce emission levels and improve environmental quality and public health. Also consider development of policy mechanisms that offer avoided emissions credits to DG owners that utilize Combined Heat and Power (CHP).
- Develop methods for the state's own energy utilization choices to support renewable energy and emerging DG technologies.
- Support efforts to increase awareness about the need for and benefits of renewable energy and DG, and educate end-users about the processes for developing and implementing renewable energy and DG projects. Facilitate the implementation of renewable energy and DG education curriculum in grades K-12 and beyond.
- Develop a statewide policy regarding standby rates and related utility charges that strikes a balance between the importance of removing barriers to renewable energy and DG and the importance of maintaining fair and reasonable rates for customers that do not self-generate.
- Continue efforts to support standardized interconnection for renewable energy and DG.
- Work with and coordinate efforts by cities and towns to develop local ordinances that are supportive of the siting and permitting of renewable energy and DG projects.
- Promote green pricing programs.
- Continue to support development of systems for demand-side bidding by ISO-NE.
- Work to better understand the technical and economic impacts of DG on the transmission system. Support T&D avoided investment credit for new DG installations.

4.3 Strategy: Support Demand Response Programs

An assessment of Load Management Opportunities in Southwest Connecticut was prepared by the Institute for Sustainable Energy at Eastern Connecticut State University in 2002. This report was a companion study to the aforementioned study on distributed generation, and was borne out of initiatives by Governor Rowland (Executive Order 26) and the Connecticut Legislature (PA 02-95) to address reliability concerns in SW CT and to study alternatives to new transmission.

The New England demand response initiative has a number of recommendations to increase the infrastructure for demand response, see: www.raabasspcoates.org

Demand response (DR) programs seek to promote demand side participation in electricity markets as a means to increase system reliability. DR programs vary widely, but in general seek to influence end-use customers to reduce load in response to economic signals. DR programs should be considered in conjunction with energy conservation and energy efficiency programs as well as with distributed generation.

In addition to reliability benefits, other frequently cited benefits of DR include its ability to mitigate electricity market price volatility, dampen market power, promote greater economic efficiency, and potentially provide a means for environmental improvement. In light of these benefits, the Board recommends that the state promote the increased development of DR, coincident with ongoing efforts to support and coordinate energy conservation and efficiency programs.

Examples of Possible Actions

- Pursue efforts to support and continue the evolution of load response programs offered by ISO-NE and provide incentives for participation by baseload DG units in Connecticut. Work with ISO-NE and utilities to encourage development of load response programs that provide meaningful incentives to potential participants in Connecticut. Look to other regional markets for examples of effective demand response programs.
- Help coordinate initiatives to promote load response programs offered by ISO-NE, with the objective of ensuring that all candidate end-users in the state are aware of and understand the incentives associated with participation in these programs.
- Support pilot programs that emphasize the use of innovative technologies (e.g., real-time communications, networking, advanced metering, direct load control etc.) and organizational structures to enable aggregation and increased end-user participation in ISO-NE demand response programs.
- Support rate design options that promote demand response.

- Support efforts to enhance customer choice and expand demand responsiveness in the retail electricity marketplace.
- Participate in the ISO-NE Regional Transmission Expansion Planning process, and support demand response initiatives as an alternative to transmission expansion.
- Support ongoing efforts to remove market barriers to development of clean onsite generation, a potentially important component of load response.
- Encourage participation by utilities and end-users in residential, mass market direct control load response programs offered by ISO-NE.
- Pursue efforts to better understand the emissions impacts of load response, including the emissions impacts of load shifting and on-site generation.
- Participate in regional efforts (such as the New England Demand Response Initiative) to build consensus and develop recommendations regarding demand response programs offerings.
- Use system benefits charge monitor, where appropriate, to support the development of a demand response infrastructure.

4.4 Strategy: Support Transportation and Land Use Policies that Reduce Energy Use

The use of fuel for transportation will have a growing impact on the use of energy resources in Connecticut over the next 50 years. One measure of this is that the transportation sector is expected to produce the greatest increase in CO_2 emissions (over 60%) by 2050. Transportation accounts for 2/3 of the nation's oil consumption. In addition to CO_2, NOx and SOx emissions from on-road and off-road mobile sources account for almost half the emissions of these pollutants.

The use of fuel-efficient alternative transportation vehicles – including hybrid vehicles --will have a great impact on reducing the use of fossil fuels, improving the State's air quality and increasing fuel diversity.

Alternatively, policies and programs to promote the commercialization and use of vehicles that use less fossil fuels such as alternative fuel vehicles and light vehicle efficiency will work toward achieving the Board's prioritization of energy in transportation and land use. In addition, actions aimed at promoting the reduction of vehicle miles traveled will also work to achieve the Board's goal.

The following is a list of recommendations that if carried out by the State will help to achieve the states goal of prioritizing efficient energy use in transportation and land use planning.

Examples of Possible Actions

- Stimulate the use and penetration of fuel-efficient, alternative fuel and hybrid-electric vehicles.
- Promote programs to lower vehicle miles traveled.
- Implement programs to reduce single occupancy vehicle miles traveled for work purposes.[refer to EPA's voluntary program on Best Practices for Commuters]
- Encourage park and ride commuter lots.
- Provide incentives for employers who implement employee programs to reduce or eliminate single passenger vehicle trips to work.
- Study the development of incentives for telecommuting.
- Educate consumers on the need to properly maintain their vehicles.
- Eliminate the barriers to the use of alternative fuels.
- Promote the establishment of infrastructure for the use of alternative fuels.
- Promote green building practices that establish biking friendly infrastructure and siting of buildings within walking distance to public transportation.
- Develop more biking paths and lanes to encourage more workers to bike to work.
- Implement anti-sprawl policies, which recognize the need to promote walker-friendly town centers and resources within walking distances of population centers.
- Encourage higher-density, mixed use, land use planning to curtail sprawl to the extent possible and promote increased transportation energy efficiency.
- Study the means to effect stricter enforcement of highway speed limits and to reduce fuel use by reducing congestion.
- Study the full cost of transportation in Connecticut and explore revision of state tax and transportation policies to more fully internalize the costs of transportation while continuing to reflect infrastructure and maintenance costs.
- Investigate opportunities for privatization and pricing of transportation functions to meet energy goals.

4.5 Strategy: Develop a Hydrogen Infrastructure Research Agenda

Transitioning to a hydrogen-fueled economy would have a tremendously beneficial impact on lessening our dependence on foreign fuel sources and drastically improving our air quality. Connecticut is home to many fuel cell companies that could be at the center of this economy.

The development of a hydrogen economy will be have a significantly positive economic impact on CT based fuel cell companies and on the CT economy overall.

Hydrogen has the potential in the longer run to displace fossil fuels in transportation and in power production. Connecticut should begin to develop an R&D program to assess the infrastructure that would be needed to implement this transition. The potential transition to a hydrogen infrastructure would substantially reduce Connecticut green house gas issues, increase fuel diversity and potentially provide jobs and additional tax revenue to the state. Possible actions to consider include:

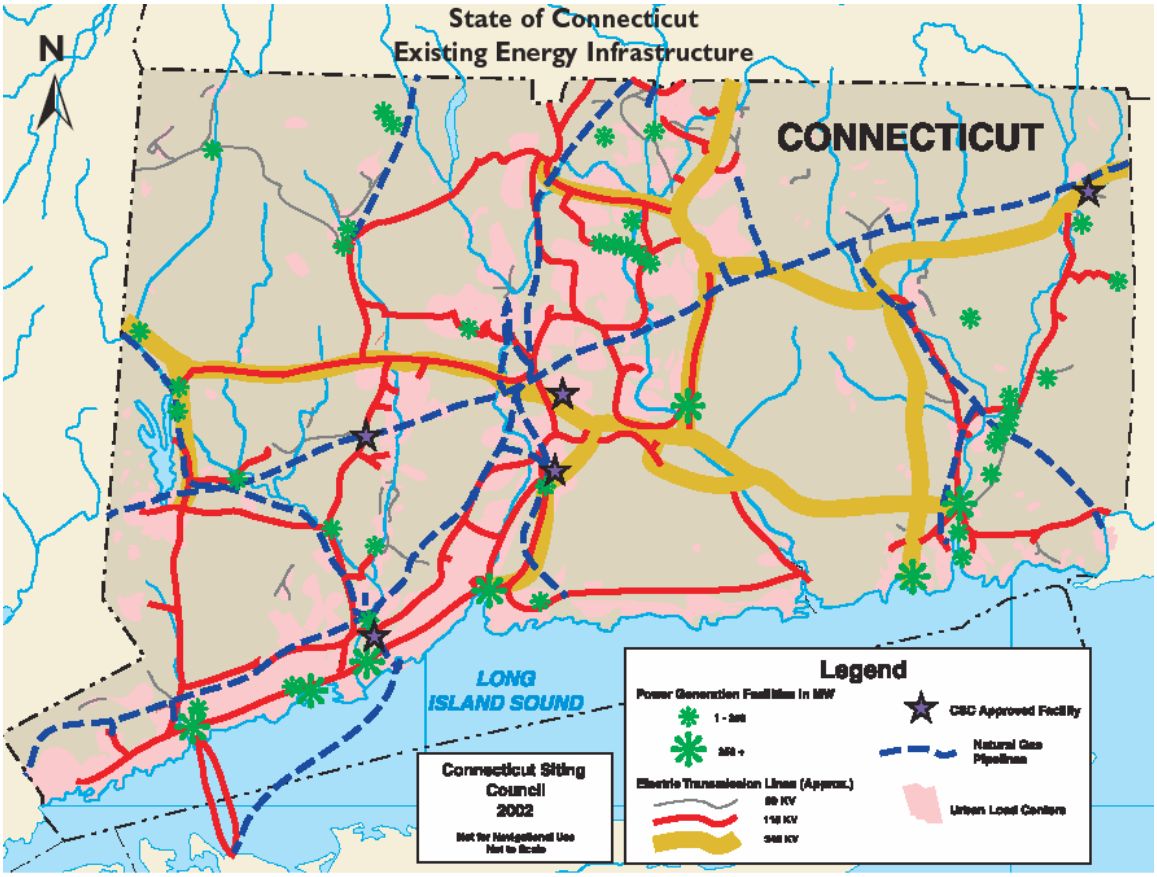
Examples of Possible Actions

- Identify possible sources of funding for a R&D Program.
- Selected demonstration projects such as vehicle sized fuel cells and safe storage systems.
- Work over the next year to develop a detailed resource agenda for the Board to consider.

5. Assessment of Energy Infrastructure

This section provides an assessment of the electric and gas infrastructure. It then provides strategies and recommendations to improve the electric and gas infrastructure.

Figure 1.
State of Connecticut Existing Energy Infrastructure



5.1 Electric Infrastructure

Generation

Currently the state is projected to have over 7200 MW of electric generation in 2004 with a projected summer peak demand of approximately 6400 MW. In 2001, Connecticut's summer peak load was 6,799 MW, exceeding the prior year's record peak by 899 MW. The 2001 record peak load was eclipsed in 2002 when the new record of 6,884 MW was set on July 3, 2002.

ISO-NE forecasts that the state's peak load will reach 7,023 MW by 2006 under normal weather conditions as the state's population and economy grow.[10]

Installed Capacity

Connecticut's installed electric generating capacity currently totals 7,037 MW based on summer ratings, as shown in Table 1. Currently, 67% of the installed electric generation capacity geographically located in Connecticut is derived from fossil fuels, approximately 28% is derived from Millstone #2 and #3 nuclear units, and approximately 5% is derived from hydropower and solid waste.

Connecticut's utilities are required to forecast incremental total electricity consumption and provide such information annually to the Siting Council. According to the Siting Council Forecast of Loads and Resources, total electricity requirements in Connecticut are projected to grow at an annual average growth rate of 1.1%, to 36,064 GWh in 2011.[11] Additional information on capacity is provided in Section 3.

According to the Connecticut Siting Council, over 1183 MW or approximately 16 % of the state's electric generation capacity is oil fired and over 40 years old. As some of these units are reaching the end of their in-service life there is a possibility these may soon be placed into retirement. Reliability has become a key issue in the operation of electric generation in Connecticut due to the age of the plants and other factors.

Transmission

Connecticut has approximately 1300 circuit miles of 115 kV lines, 398 circuit miles of 345 kV lines, 5.8 miles of 138 kV lines, and 104 circuit miles of 69 kV lines. There are a number of planned transmission upgrades as shown in Figure 2. In particular CL&P has proposed two new 345 kV projects. The Southwestern portion of the state has experienced reliability issues and is one of the "congested areas" for transmission as determined by the ISO.

5.2 Strategy: Promote electric system reliability

This summer's electricity black-out, along with the recent problems in SW CT, signaled the need for increased efforts to improve the reliability of our electric system throughout the United States. These efforts are necessary at the state, regional, and national levels. The Board recommends that Connecticut play an active role in participating in formulating strategies to increase the electric system's reliability. Working with ISO-NE and other groups, the state

[10] ISO-NE *Technical Assessment of the Generating Resources Required to Reliably Operate Connecticut's Bulk Electric System 2003 and 2006*. Final Report. System Planning, January 29, 2003.
[11] Connecticut Siting Council, *Review of the Connecticut Electric Utilities' Ten-Year Forecasts of Loads and Resources, 2002*.

should help promote a system that will ensure a reliable supply of electricity for all of the state's citizens, including the state's industrial and commercial sectors whose processes are highly dependent on reliable electric supply. The Board recommends that it be the policy of the state to explore the performance of electric distribution systems and to promote policies aimed at improving the reliability of the electric system.

Examples of Possible Actions

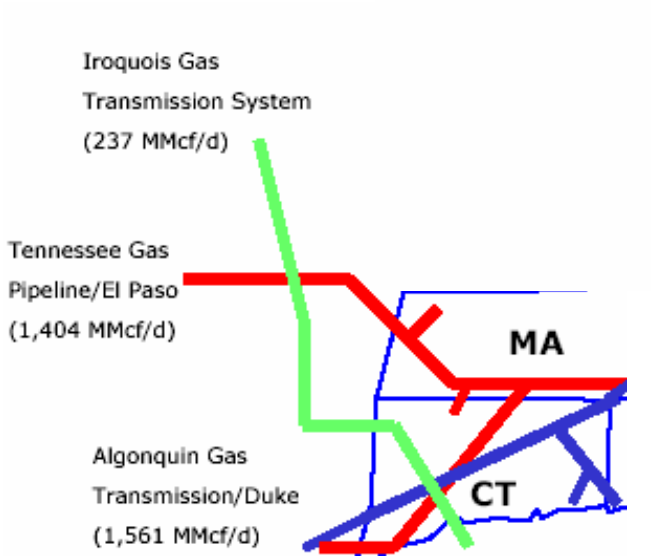
- Hold a generic proceeding on electric system reliability;
- Consider all proposed transmission upgrades;
- Include reliability indices in any Performance-Based Rulemaking;
- Review recent T&D proceedings in other states;
- Explore the use of clean distributed generation to defer distribution system upgrades;
- Participate actively in regional and national efforts to improve the reliability of our electric system;

5.3 Natural Gas Infrastructure

Pipelines

Three major interstate gas pipelines serve Connecticut -- Tennessee Gas Pipeline, Algonquin Gas Transmission, and Iroquois Gas Transmission System -- as shown below in Figure 2. The majority of Connecticut and New England's natural gas is delivered by two major interstate systems: the Algonquin Gas Transmission system and Tennessee Gas Pipeline system, which, as shown in Table 1, move gas from the Gulf of Mexico region up through the Mid-Atlantic states and New York, and then into New England and through Connecticut. Together, these two systems make up nearly 80 percent of the New England's pipeline capacity. These pipelines also draw supply during peak demand periods from underground storage caverns located in Pennsylvania, which are filled with natural gas under high pressure during the summer months.

Figure 2.
Natural Gas Pipelines Serving Connecticut



Connecticut, as well as all of the New England states except Vermont, is using 80 percent or more of pipeline capacity during peak months.[12] Several pipeline expansion projects were completed in 2001-2002 in the New England region, mainly to serve Boston and New York City, although none in Connecticut.

Connecticut has no natural gas reserves or oil or gas well production within its borders, and consequently is dependent on the interstate natural gas pipeline network from neighboring Massachusetts and New York for its consumption needs.

Since 1991, the Iroquois Pipeline has delivered gas from western Canada to markets in New York and New England and has interconnections with the Tennessee and Algonquin systems in New York and Connecticut. As an example of capacity growth, Iroquois has nearly doubled deliverability along its system in less than a decade, growing from about 550 million cubic feet per day (MMcf/d) to over 1 billion cubic feet per day (Bcf/d). A summary of natural gas pipelines serving Connecticut, and that cut across other New England states, is shown in Table 1 below.

[12] Natural Gas Transportation - Infrastructure Issues and Operational Trends, EIA, October 2001.

Table 1.
Natural Gas Pipelines Serving Connecticut (and New England)

PIPELINE NAME	DATE OF OPERATION	OWNER	2001 CAPACITY (MMCF/D)	PRIMARY SOURCE OF SUPPLY
Algonquin Gas Trans Co.	1953	Duke Energy	1,561	Gulf Coast
Iroquois Gas Transmission System	1992	Partnership of 9 U.S./Canadian energy firms.	237	Western Canada
Tennessee Gas Pipeline	1951	El Paso	1,404	Gulf Coast and Canada. Interconnects with storage facilities in PA and NY

Source: New England Gas Association

Natural Gas Storage

Gas storage levels entered the winter of 2002-03 at higher-than-average levels and ended the winter at lower-than-normal levels, due to a cold winter in the East (and Northeast) and high consumption. Concerns about storage in the Spring and early Summer contributed to further volatility in commodity prices, with the price exceeding $6/MMBtu in June 2003. However, concerns abated as a relatively cool summer in many parts of the U.S., including the Northeast, reduced electricity demand and storage injections proceeded at a healthy clip. By late September, storage levels nationally were less than 2% below the 5-year average for that time of year, and appeared well-on-track to be at normal levels (approximately 3 trillion cubic feet) by November 1, the traditional start of the winter heating season.

5.4 Strategy: Enhance natural gas infrastructure

Examples of Possible Actions

- Support regulatory streamlining for new natural gas pipelines;
- Certify the character and quality of gas transportation infrastructure;
- Support for additional LNG supplies in New England to meet market demand and enhance system security and reliability;

- Encourage greater natural gas supply diversity to enhance system security and reliability;
- Conduct a regional national gas flow simulation to dynamically identify availability and supply constraints;
- Promulgate standards for coordination of scheduling for delivery of natural gas to users;
- Recognize that firm versus non-firm levels of natural gas transportation service can impact reliability of delivery to such end-users as power generators and that appropriate market signals need to be sent to ensure infrastructure is developed where and when it is needed on the system; and
- Implement consider gas energy efficiency programs using a systems benefit change.
- Support increased pipeline capacity and deliverability into the Northeast to meet market demand and enhance system security and reliability;
- Support the timely review of projects and a streamlining of the regulatory process where possible, to enable projects to proceed in a timely manner;

5.5 Impact of Standard Market Design and Development of a Regional Transmission Organization

Refer to NEDRI efforts in here as well

This section assesses the impact of Standard Market Design (SMD) and the development of a regional transmission organization. Since 2000, the Federal Energy Regulatory Commission (FERC) has actively supported the cross-regional coordination of wholesale energy markets, and the use of SMD to promote further development of competitive and reliable wholesale energy markets.

FERC Order 2000, issued December 15, 1999, called for regional consolidation and the development of super-Regional Transmission Organizations (RTOs) throughout the country. This was the primary driver behind the now defunct efforts of ISO New England (ISO-NE), New York ISO (NYISO), and Pennsylvania, New Jersey and Maryland ISO (PJM) to form a single RTO for the entire Northeast. FERC's July 31, 2002 SMD Notice of Proposed Rulemaking (SMD NOPR) changed the emphasis from consolidation to standardization. Based on feedback from energy industry stakeholders on the SMD NOPR, FERC's most recent white paper, "Wholesale Power Market Platform," issued in April 2003, continues to support standardization and regional coordination, but indicates that FERC will likely permit flexibility on how these goals can be achieved. Concurrent with FERC initiatives, ISO-NE has been pursuing both the implementation of SMD and the formation of an RTO. Both efforts are works in progress.

The long-term goals of SMD and RTO are consistent with Connecticut's efforts to foster efficient, competitive and reliable electricity markets. However, wholesale market changes give rise to potential short-term impacts that are important to monitor. For example, regional consolidation and the use of locational pricing give rise to concerns with cost shifting and potential increases in the cost of electricity at the local level. Notably, the process of SMD implementation and RTO design creates an opportunity for states, such as Connecticut, to influence and monitor wholesale electricity market developments and ensure that related impacts are consistent with state goals. Objectives for the State to consider include:

- Ensuring efficient, competitive, and reliable electricity markets;
- Minimizing cost shifting;
- Increasing Connecticut's role in wholesale market development;
- Encouraging efficient investment in energy infrastructure;
- Removing market barriers for renewable energy.

Wholesale energy market rules and related activities significantly impact Connecticut energy users. Therefore, the Board recommends that the state closely monitor and participate in

federal and regional electricity market activity, support initiatives to increase the role of states in regional electricity market decision-making, and work with other states, Independent System Operators, transmission owners, and others to further Connecticut's energy policy goals.

5.6 Strategy: Actively participate in the continuing development of the wholesale power market

Examples of Potential Actions

Examples of potential actions that Connecticut could take to ensure consistency with the above objectives include:

- Xlosely monitor and evaluate, the impacts of ISO-NE's ongoing development and implementation of SMD and related initiatives, such as the development of a Regional Transmission Organization (RTO). Continue to participate in SMD and RTO related working groups;
- Support development of a Regional State Committee (RSC) that would be able to provide policy recommendations to FERC and ISO-NE on wholesale market issues concerning transmission planning, market operations, renewable energy, etc. Actively participate in the RSC if it is formed;
- Xlosely monitor and evaluate, the Northeast Seams Project and related efforts to coordinate regional wholesale markets, including but not limited to ISO-NE;
- Support the consideration of all options (e.g., demand response, energy efficiency, etc.) during regional transmission and related energy planning initiatives. Participate in and monitor the ISO-NE Regional Transmission Expansion Planning (RTEP) process;
- Support strong and independent wholesale market monitoring unit at FERC& CT ISO-NE. Respond to any exercise of market power by regulated or unregulated market participants;
- Support the siting and interconnection of new generation consistent with Connecticut's environmental goals;
- Support ongoing (e.g., New England Generation Information System) and new initiatives to remove wholesale market barriers to renewable energy and distributed generation. Support regional efforts to coordinate renewable energy and environmental policies; and
- Continue to coordinate and refine implementation of retail market procedures and business rules with other states, to the extent that these should be compatible with wholesale market rules and operations.

6. Alternative Planning Mechanisms

Due to the large number of state agencies with energy-related programs and responsibilities, a great need exists for ongoing coordination of programs. While the state's energy policies are sound, there also exists the need for an ongoing energy planning review process. The following list includes state agencies with energy-related programs and responsibilities:

- CONNECTICUT ENERGY CONSERVATION MANAGEMENT BOARD
- CONNECTICUT CONSUMER EDUCATION ADVISORY BOARD
- OFFICE of POLICY & MANAGEMENT (OPM)
- DEPARTMENT OF PUBLIC UTILITY CONTROL (DPUC)
- OFFICE OF CONSUMER COUNSEL
- CONNECTICUT SITING COUNCIL
- OFFICE OF THE CONNECTICUT ATTORNEY GENERAL.
- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)
- DEPARTMENT OF TRANSPORTATION (ConnDOT)
- DEPARTMENT OF SOCIAL SERVICES
- DEPARTMENT OF PUBLIC WORKS
- DEPARTMENT OF ECONOMIC AND COMMUNITY DEVELOPMENT
- CONNECTICUT INNOVATIONS, Inc. (CII)
- CONNECTICUT HOUSING INVESTMENT FUND (CHIF)
- CONNECTICUT DEVELOPMENT AUTHORITY
- CONNECTICUT RESOURCES RECOVERY AUTHORITY
- STATE BUILDING INSPECTOR.

Many state agencies have authority over some decisions that affect energy use, energy demand, energy technology, energy supply, energy price and the environmental and other impacts of energy. However, since the energy system is affected by so many types of policies, most agencies have insufficient authority over a sufficiently broad range of energy-related policies to make the decisions that are needed to implement a coordinated set of energy policy strategies. The Board therefore recommends that a top level independent energy office be established. This Board would serve as a formal advisory Board to the cabinet level energy office. Many neighboring state such as Massachusetts, Rhode Island, New York and Maine have a separate energy office.

6.1 Strategy: Establish a top level energy office

With a clear mandate to coordinate and require implementation of state energy policy, this office could also undertake the following potential actions:

- Address the environmental impacts of energy use in the transportation sector and how to incorporate energy impacts into transportation decision making and planning;
- Address the relationship between transportation and land-use planning and develop guidelines to demonstrate how land-use planning can work to increase energy efficiency in the transportation sector;
- Develop and monitor energy policy benchmarks;
- Develop recommendations for alternatives to Integrated Resource Planning (IRP);
- Coordinate and integrate updates to energy-related state plans;
- Act as the point agency for activities and programs related to renewables and efficiency;
- Implement gas energy efficiency programs;
- Report to Connecticut citizens on progress on State Energy Goals each year;

7. Energy Policy Strategies and Recommendations

Throughout this report there are policy strategy recommendations and potential actions. These are summarized here in thus chapter. The Strategies are summarized here below:

(NOTE to reviewers – We would like to present in this chapter the "Top Priority" potential actions for each strategy- we envision 3-5 per strategy) We would like suggestions from you and / or possibly doing this in the workshop on the 18 th.- let use know if that makes sense.)

1) Continue to support energy efficiency
2) Support renewable energy technologies
3) Support demand response programs
4) Support transportation and land use polices that reduce energy use
5) Develop a hydrogen infrastructure research agenda
6) Promote electric system reliability
7) Enhance natural gas infrastructure
8) Actively participate in the development of the wholesale market
9) Establish a cabinet level energy office

Summary of CEAB Preliminary Comments on Draft Energy Plan

This document includes a summary of preliminary comments on the plan that have been received to date.

Scope and Vision

This should be a plan that will coordinate all of the various efforts now ongoing in local, regional and national arenas to produce a desired overall effect. In other words, the plan should be written as the overall policy plan for the State of Connecticut, not just for the CEAB. All ongoing efforts by the State and all of its instrumentalities should be in harmony with this plan – the plan should not be subordinate to those efforts.

The plan should add a section entitled Purpose that would outline the purpose of the report. This would more fully introduce the new CEAB and its new responsibilities.

The plan should lay out a vision and course of action & then recognize the various programs and policies by showing how they implement the overall plan.

Plan needs more context and history – should mention Enron and what happened in California. Some mention of the failed NE/ NY ISO merger should be included.

The plan should recognize that there are short-term, mid-term and long-term strategies for example, in the electric world, the plan should emphasize and expand the implementation of conservation and efficiency programs in SWCT as a strategy to compensate for the weakness of the electric system in that part of the state. This is clearly a short-term strategy with long-term sustainable benefits. By contrast, the Plan should recognize that the congestion fix in SWCT is a mid-term strategy, requiring a coordinated bundle of solutions including Transmission, DG, Load Management and DSR. Finally, long-term strategies include the development of real demand response mechanisms and implementation of a stable and liquid wholesale market. Grouping our strategies in this way will make it easier to understand the overall direction and point out the importance of each program and policy that makes up the whole.

Finally, the plan needs to recognize the importance of all components of our energy system – which include both electric supply (oil/gas/coal/nuclear/renewable) and gas supply, and we need to explain the interrelationship between them.

Overarching Issues

Coordination of State Energy Policy

The Plan's recommendation that there should be a cabinet level Energy Office was viewed by most reviewers as premature. Pros and Cons of this suggestion need to be flushed out. Most reviewers thought this role belonged to CEAB.

There continues to be an ongoing recognition that Connecticut lacks, and would benefit from, a coordinating entity to shape the state's energy policy. Not surprisingly, there are a variety of different bureaucratic structures that have been employed by different states to serve this important function. While it is important to recognize that the primary impetus behind the recent changes in the structure of the CEAB was a desire to better coordinate the siting of various energy facilities, it seems that a logical and appropriate extension of this new siting role is the CEAB assuming a larger state energy policy role as well. The current structure of the CEAB, as a bipartisan, multi-agency, multi-branch entity has elements that could allow it to effectively act in just such a role. The emergence of the CEAB is such a new role need not be a proclaimed as statutory mandate for it to occur. Rather, the CEAB can by its own actions, such as the development of a well-reasoned and focused state energy plan, begin to take upon itself that coordinating role by showing leadership.

Fuel Diversity

Fuel diversity and a balanced energy portfolio may be the most challenging long-term issue. Electric generation from combined-cycle gas facilities is a demonstration that fossil fuels still have a valuable role to play and can be used in a manner that enhances, not degrades, the environment. But overdependence on gas generation could be disastrous, since gas supply has historically been a boom-and-bust business, with great price volatility. In 1999-2000, over a six-month period, the price of gas increased by fivefold.

Some reviewers thought section on Hydrogen Economy might be premature. Nuclear energy was thought to be a cheap and virtually inexhaustible source of energy. Today, many believe that the Hydrogen economy offers the same kinds of potential. History demonstrates that progress is made, for the most part, through trial and error. The plan needs to continue pursuing the goal of providing a reasonable degree of energy self-sufficiency, balanced with strong regional markets.

Regionalism

Another key long-term issue is energy planning. The days when locally regulated suppliers served our state are over. In the new world, energy companies are regional, national or even multi-national. More and more, decisions about the construction and expansion of facilities in our region require the coordination of multiple states and the federal governments of the United States and Canada. New organizations, like ISO-NE, have appeared on the landscape, taking over functions once performed by private companies and individual states. Existing organizations, like FERC, have reoriented themselves to regional and national perspectives, driving new policies that limit the power of individual states. The state need to engage these processes, creating policies and institutions that will ensure Connecticut can flourish and prosper in this new world.

If a federal energy plan passes the impacts of this plan must be accounted for in this document.

Creation of Demand Side Response

Demand side response is a key element in any market. The ability of consumers to choose from a range of energy choices is what will drive price down. Consider retail food and gasoline

markets: these are very efficient markets, operating with small margins. This is because consumers can compare prices and services and can switch from supplier to supplier based on price or other factors. Hence an important role for both demand response and energy efficiency programs is to promote the development of competitive markets for these services.

The plan should more explicitly include some of the NEDRI suggestions for Load Response.

Work In Progress

- The plan is necessarily a snapshot in time, a recognition of the current position and the options now at hand. Five years ago, combined-cycle generation was a new concept. Today, it is the major factor driving the evolution of the generation fleet. Tomorrow, hydrogen generation may make all hydrocarbon generation obsolete.

- The plan needs to explicitly recognize the developing nature of regional institutions and markets and the changing nature of the energy industry as a whole. While basic goals may remain relatively unchanged, the short-term tactics and long-term strategy for their implementation will change, perhaps very rapidly at times.

- This means the plan will need to have flexibility – the ability to change tactics and strategies to pursue long-term goals and current circumstances change.

Thoughts on Role of New CEAB/ Development of Preferential Standards

The structural changes that have been incorporated into the new CEAB have the potential to positively reshape our state's regulatory review process to ensure that we balance our state's various competing policy interests. In the last several years, our state has been faced with numerous utility proposals; from new overhead power lines to buried cables under Long Island Sound, but with every plan there continues to be conflicting views from the environmental community and the energy sector, on how best to address the situation. While the existing review and approval process has many positive traits- it has two basic shortcomings. First, it is designed to consider only one proposal at a time- resulting frequently in an applicant's race to the regulators' door. Second, it requires the approval of every proposal that meets all the legal requirements- not distinguishing between them on the kinds of quality-of-life criteria that affected communities and residents consider most important. Factors like the size, appearance and overhead or buried installation are not covered under the current system – what matters is whether the construction is safe and meets various code requirements. Ultimately however, our solutions cannot be an either/or proposition. Both environmental and energy needs must be reviewed together and addressed in a complementary fashion.

Key Elements:

Development of a Planning Authority:

This element involves the creation of a coordinating authority (new CEAB), which would be made up of representatives of the various public agencies with a role in the review and approval of such proposals. In its primary role- this authority would seek to encourage competing proposals through the use of an RFP process. This would work in either of two modes – prospective or reactive.

RFP Process

In the prospective mode, the authority would make a determination that improvements to a utility system were required (for example, determine that a congestion problem exists in SWCT). It would then issue an RFP, requesting that parties respond with possible solutions. These could include transmission, generation, conservation, load management, load response or any other effective strategy or combination of strategies. In the reactive mode, an RFP would be issued to solicit competing ideas where a proposal is filed before the authority determines that improvements are required. In either case, the result is not only to produce competing proposals, but also to produce different competing strategies for resolving the issue – for example, more conservation versus more transmission. The proposals thus produced would be considered in "batches," so that proposals can compete head to head and succeed or fail on their relative merits.

Development of Preferential Criteria:

This element requires the participation of all stakeholders to develop preferences that would be used to review competing energy proposals. The preferential criteria would include environmental benefits as well as public interest and economic development benefits and will utilize a competitive selection process. More importantly, when these preferential criteria are published, they will encourage planners to make wise decisions from the outset, rather than aiming for the minimum and making concessions only under the threat of disapproval. This effect will be compounded by the simultaneous consideration of multiple proposals, since the successful proposal is no longer going to be the one that just meets the minimum standards; it will be the best proposal.

Specific Comments related to Transportation initiatives:

- Section 3.12: Prioritize Energy Use in Transportation and Land Use
    1. The "Progress to Date" sub-section appears to be out of context to the topic of the section. This sub-section is discussing fuel cell technology, not transportation and land use progress to date.
    2. The Recommendations of the section encourage policies and programs that aim to reduce energy use in transportation and land use be further developed and carried out.

3. Overall statements are very generalized. The impacts to transportation by the promotion of programs to reduce VMT, land use policies to curtail sprawl, and education of consumers on the need to participate in activities to reduce VMT and to reduce the impact of their automobiles can not be determined.
4. In the Outstanding Issues sub-section, it is unclear what is meant by "to practice to reduce the pollution impacts of their automobiles."

- Section 3.13: Stimulate Commercialization of High Mileage and Alternative Fuel Vehicles

1. The Recommendations of the section which states, "adoption of policies aimed at reducing fuel consumption in the State's transportation sector by encouraging the use of fuel-efficient alternative fuel and hybrid vehicles," will have no short-term effect on transportation.
2. Long-term effects may be significant due to the direct relationship between the funding of transportation systems (highway, bus and commuter rail) and the collection of gasoline taxes. These taxes at both the state and federal level provide the financial resources to support our transportation systems. If the efforts of this section were successful, new and acceptable means of supporting transportation would have to be found.
3. Consideration and planning for an alternate funding mechanism should be examined.

- Section 4.4 Strategy: Support Transportation and Land Use Policies that Reduce Energy Use

1. The section is keyed to actions to meet the goal of reduced energy use through VMT reduction.
2. Of the actions listed, many have already been implemented, i.e., "Implement programs to reduce single occupancy vehicle miles traveled for work purposes."
3. Suggest that this section be sub-divided between the continuation and expansion of exiting programs and efforts, and those which are more difficult and may have not been implemented, such as "Implement anti-sprawl policies, which recognize the need to promote walker-friendly town centers and resources within walking distances of population center."

Lastly, the plan does not recognize that the easy actions to reduce VMT growth have already been implemented and the more difficult (land use and alternate fuel vehicles) lie ahead. The plan also does not recognize the public's propensity for an independent and convenient means of travel that the private automobile provides. The "low hanging fruit" for VMT growth reduction have been put in place and implemented. The plan should recognize that only the rate of growth of VMT will be effected and most significant inroads to energy use reduction rest with land use and alternate fuel vehicles, not VMT reduction.