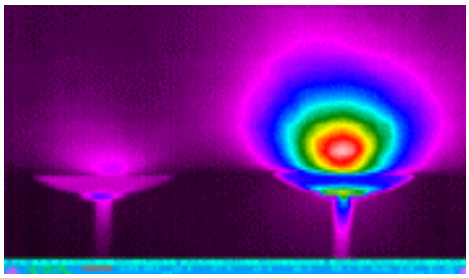
# Report of the Energy Conservation Management Board

# Year 2000-2001 Programs and Operations





**Prepared for the State Legislature's**

**Energy & Technology Committee**
**Environment Committee**

**Under PA 98-28**
**An Act Concerning Electric Restructuring**

**January 31, 2001**

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## Executive Summary

The Legislature created the Energy Conservation Management Board (ECMB or the Board) pursuant to Section 33 of PA 98-28, An Act Concerning Electric Restructuring. The Board is to act in an advisory capacity to the Department of Public Utility Control and the State's electric distribution companies in formulating annual energy conservation and load management plans (Plans). Under the Act, electric customers of CL&P and UI fund these programs in Connecticut through a 0.3 cents per kWh charge on their electric bills.

The ECMB is proud of its accomplishments and the performance of the programs enabled by the Plans. These energy conservation programs are saving consumers money, promoting economic development and helping to clean Connecticut's air. With respect to the year 2000 programs, we can to date report that:

- *The programs capture numerous cost-effective opportunities*. Virtually all of the funds collected in 2000 have been spent. Some $85 million was spent in 2000 and $86 million is projected to be spent in 2001 on cost-effective programs;

- *The 2000 programs will save approximately 251,865,380 kWh*. This represents the amount of electricity used by 29,302 average homes in a year. Importantly, the programs saved energy at a low average cost of $0.023 per kWh compared to an average residential retail value of $0.11per kWh;[1]

- *The programs have reduced peak demand by approximately 63 MW*. This assists in increasing the adequacy of electric supply making the entire electric system more reliable and less expensive to operate;

- *The 2000 programs will avoid* 286 tons of NOx, 843 tons of SOx and 206,712 tons of $CO_2$ -- contributing in a meaningful way to addressing Connecticut's air pollution problems;

- *All customer classes are being served by the programs.* Programs are being offered to residential and low-income customers, small, large and medium businesses and town and State buildings; and

- *Approximately 300,000 customer transactions were supported by the programs in year 2000*.

- *Lifetime bill savings for year 2000 programs amount to approximately $325 million.*

In addition, the Board has worked with the Companies and DPUC to pursue innovation in program delivery and design.

[1] Calculations are based upon preliminary data supplied by CL&P and UI.

## The ECMB Process

The ECMB, comprised of divergent stakeholders from the consumer, environmental, low-income, electric distribution companies and business consumer communities, has found common ground on a great many issues raised by this effort. The ECMB, by retaining independent experts to assist it, has been able to influence the CL&P and UI annual Plans, initiate new programs and thereby increase public input into the programs.

The ECMB established a multi-part review and public oversight process for the expenditure of conservation funds. Programs proposed by the electric distribution companies are reviewed by the ECMB. The ECMB itself has retained independent consultants who assisted the companies in developing proposals, establishing performance measures, addressing budgets and assessing other strategic issues.

The ECMB has also undertaken extensive efforts to afford the broadest public input to the Plans. This year over 100 copies of the Plan were mailed out to interested persons and organizations for comment, in addition to distribution of innumerable electronic copies, web access and links from other sites. The Board received written or oral comments from approximately 20 participants at a special Public Meeting at the Legislative Office Building held on November 14, 2000.

The ECMB then votes on resolutions regarding the and other policy issues.[2] The Plans are then filed by the electric distribution companies in a public docket before the DPUC, which must authorize the disbursement of the collected funds. We believe that this process provides significant public oversight and input into the development of programs.

During its second year, as specifically provided for in the legislation, the ECMB enlisted the aid of outside experts and a part-time coordinator to provide professional assistance to the Board in interacting with the electric distribution companies in a more comprehensive way. The independent consultants allow the Board to more effectively formulate detailed positions and policies. The consultants have provided detailed information and useful analysis on program design, implementation, performance measures and incentive structures and help provide context for programs and policies from an independent perspective. While the legislation provides for utilization for as much as 5% of the total budget for this purpose, direct expenditures for the consultants and coordinator are only approximately 0.2% of the total expenditures.

## Goals and Objectives

At the outset of its work in Spring of 1999, the Board established goals and objectives for the annual conservation and load management (C&LM) Plans within the context of policy rationale for C&LM in a restructured industry.

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[2] The Board requires a supermajority of seven affirmative votes of its 11 members for approval of resolutions and issues concerning budget expenditures. In submitting its resolutions to the Department, in one instance where a supermajority was not reached, the ECMB discussed the unresolved issues surrounding the vote.

From its genesis, the ECMB has recognized that these are consumer funds imposing a special obligation of care on their expenditure. The ECMB has worked to link expenditures of program funds to important public policy goals such as reducing electricity demand, improving air quality and promoting economic development.

Specific objectives to achieve these goals include lowering energy costs while increasing productivity, creating an energy efficiency "ethic", increasing the competitiveness of Connecticut businesses in the global economy, providing quality programs that meet customers' needs, allocating resources in an equitable manner, pursuing uniform statewide programs, increasing use of third parties, demonstrating success in achieving energy, environmental and economic goals, and seeking linkages to other funds.

**Balancing Strategic Interests**

In carrying out its mandate, the ECMB has attempted to weigh competing interests while addressing several strategic concerns.

Public Act 98-28 takes a broad view of the activities and initiatives that could be addressed with the conservation surcharge funds. The ECMB believes that these resources should continue to be strategically allocated to provide long-term benefits to Connecticut and its citizens.

The ECMB has agreed that C&LM funds for 2001 should be allocated among the following six broad strategic areas:

Market Transformation & Lost Opportunities
Technical Assistance, Education & Outreach
Special Needs Markets
Economic & Competitive Market Development
System Reliability, Load Management
Research, Development & Demonstration

These areas not only comply with the legislation but also ensure that certain equity considerations are met. One such measure of equity is the derivation of the funds by customer segment versus programmatic expenditures for those same customer segments.

**The 2000-2001 Plans**

The first Plans were developed during 1999 for the year 2000 and were submitted to the Department of Public Utility Control. The DPUC issued Final Decisions for each of the Companies approving the Plans, modifying goals for several programs and providing additional direction.

The 2001 Plans build on the strengths of the 2000 programs, but modify and supplement them with new initiatives developed by the companies with the ECMB and its

independent consultants. The 2001 Plans reflect significant work undertaken to address issues raised by the DPUC, the ECMB and ECMB consultants, including:

- ***Common Statewide Programs***. The 2001 programs will offer a total of 13 common residential and commercial and industrial (C&I) programs for 2001 by UI and CL&P. Planning is underway to have the C&I new construction programs become identical in 2002 and a joint filing for the two companies in 2002.

- ***Third Party Program Delivery***. The consultants to the ECMB recommended several new programs/program enhancements which the companies have adopted. Two new programs have been proposed in direct response to recommendations from the ECMB consultants: a Community Based Program and an Operations and Maintenance Request for Proposal (RFP) Program. In addition, for 2001 there will be an expansion of the RFP pilot initiated in 2000. The Community Based Program will also explore a residential financing mechanism for pilot implementation in 2001.

- ***Research, Development and Demonstration.*** One aspect of Connecticut's programs that differentiates it from many conservation and load management efforts around the country is its comprehensive Research, Development and Demonstration (RD&D) program. The program advances economic development in Connecticut, by directly supporting and encouraging the growth of research activities within the State and through public-private partnership demonstration programs which can enhance the energy efficiency, productivity and competitiveness of commercial and industrial facilities in the State. During the past year, the initiative has named members to a Policy Working Group that developed criteria for project selection, analyzed projects according to these criteria and awarded funds to promising technologies.

**Issues to be addressed in 2001**

- Construction of a second and possibly third energy efficiency center
- Creating synergies with CT Clean Energy Fund, Rebuild America, Energy Conservation Loan Fund and other entities
- Continued movement toward third party participation
- Distributive resources (DR) and renewable energy policies
- Load management opportunities
- Exploring greater insurance tie-ins which motivate sales in energy efficiency (e.g. reducing fire hazards, improving air quality)
- Fostering greater public participation and web availability of information
- Continued movement toward identical programs for CL&P and UI.
- Comprehensive monitoring of program performance

# Report of the Energy Conservation Management Board

## Overview of Conservation &Load Management Programs

Connecticut Public Act 98-28, An Act Concerning Electric Restructuring significantly altered the shape and nature of regulation of the electric industry in Connecticut. The Act provided for retail choice of electricity supply and opened the generation segment of the industry to the forces of competition beginning in the year 2000.

The ECMB was created by Section 33. Our statutory mission is to advise and assist the distribution companies in the development and implementation of comprehensive and cost-effective energy conservation and market transformation plans**.** (Sec 33(d), PA 98-28, An Act Concerning Electric Restructuring.)

Recognizing the important role energy conservation can play in this restructured industry, the Connecticut General Assembly provided increased funding for conservation and load management (C&LM) efforts. This report, as required by Sec. 33(d) will provide a synopsis of Energy Conservation Management Board (ECMB) activities to the joint standing committees of the General Assembly having cognizance of matters relating to energy and the environment.

The ECMB believes that funding comprehensive conservation and load management programs is a vital component to the functioning of electric markets in a restructured industry by reducing the need for additional peak capacity and moderating price spikes during peak use. Despite the challenging task of ramping up conservation efforts, the Companies have spent all of the 2000 funds on cost-effective programs. Even with these efforts, there are still many opportunities for increased energy efficiency and load management programs among residential, low income and business customers throughout the State.

The Board is pleased to report on our activities to date, our role in reviewing the Plans of each company and highlight some of the policy issues the ECMB expects to pursue in the coming year. The Board is proud of its accomplishments and the performance of the programs. The energy conservation programs are saving ratepayers money, promoting economic development and helping to clean Connecticut's air. With respect to the year 2000 programs, we can to date report that:

- *The programs offer numerous cost-effective opportunities*. Virtually all of the funds collected in 2000 have been spent. Some $85 million was spent in 2000 and $86 million is projected to be spent in 2001 on cost-effective programs;

- *The 2000 programs will save approximately 251,865,380 kWh*. This represents the amount of electricity used 29,302 average homes in a year. Importantly, the

programs saved energy at a low average cost of .023 cents per kWh compared to an average residential retail value of $0.11 per kWh;[3]

- *The programs have reduced peak demand by approximately 63 MW.* This assists in increasing the adequacy of electric supply making the entire electric system more reliable and less expensive to operate;

- *The 2000 programs will avoid* 286 tons of NOx, 843 tons of SOx and 206,712 tons of $CO_2$ -- contributing in a meaningful way to addressing Connecticut's air pollution problems;

**Table 1. Reductions in Criteria Pollutants and Carbon Dioxide (in Tons)**

| | Year 2000 | 2000 Lifetime | Year 2001 | 2001 Lifetime |
|---|---|---|---|---|
| **SOx** | 843 | 12,403 | 891 | 13,453 |
| **NOx** | 286 | 4,201 | 302 | 4,557 |
| **$CO_2$** | 206,712 | 3,040,701 | 218,339 | 3,298,256 |

- *All customer classes are being served by the programs.* Programs are being offered to residential and low-income customers, small, large and medium businesses and town and State buildings across the State; and

- *Approximately 300,000 customer transactions were supported by the programs in year 2000.*

- *Lifetime bill savings for year 2000 programs amount to approximately $325 million.*

## ECMB Process

Since April of 1999, the ECMB has met on a monthly basis and on a biweekly basis for the months immediately prior to finalization of Plans. Meetings have been well-attended with active dialogue. We believe the ECMB's work has been thorough and has enabled members to share perspectives in a constructive, collaborative and effective process. Despite philosophical differences, ECMB members found common ground on many issues. ECMB members have often achieved consensus by studying issues, educating each other regarding implications of various options, and evaluating whether outcomes would be desirable for Connecticut's economy, ratepayers and environment.

The ECMB meetings focused on a number of policy areas driven by energy conservation activities. The ECMB process employs a Steering Committee composed of: a representative of the environmental and consumer groups (Daniel Sosland of Environment Northeast), a representative of the business consumer groups (John Rathgeber of CBIA), and a representative of the Companies on an alternating basis

[3] Calculations are based upon preliminary data supplied by CL&P and UI.

(Michael Townsley of NU or Philip Turner of UI). Cindy Jacobs, Department of Public Utility Control (DPUC) staff, also participates in Steering Committee calls and at ECMB meetings. The Steering Committee met regularly via conference call between ECMB meetings, set meeting agendas, acquired relevant information for distribution to ECMB members and proposed draft resolutions for consideration. (See **Appendix A** for a list of all Board participants and their affiliations.)

The ECMB's highest priority has been to review the conservation Plans of CL&P and UI. Since April of 2000, the ECMB made extensive use of expert, independent consultants it retained to assist the Board in reviewing the Plans and interacting with company staffs. These independent consultants provided the Board with the capability to analyze residential, commercial/industrial and research, development and demonstration (RD&D) and distributed resource programs as well as to perform coordinating and administrative functions. The consultants provided outside expertise, not only in programmatic design but also in the nuances of goal setting, performance and incentive structures, which heretofore had not been available to the Board. This expertise enhanced Board members' ability to interact with company staffs and provide input into the Plans. CL&P and UI incorporated much of the input from the consultants and the public into their Y2001 Plans.

ECMB members, supported by the Board's independent consultants have reviewed draft Plans submitted by the Companies and commented on later iterations of these Plans during ECMB meetings.

The ECMB expanded upon the formal process for public input established in the first year by creating a list of approximately 100 interested persons and organizations and sending notices and draft Plans to them so they could review and comment upon the proposed Plans. An open public meeting was held on November 14, 2000 at the Legislative Office Building at which oral comments upon the draft Plans were provided by numerous groups. The ECMB received written and/or oral testimony from approximately 20 interested parties on the draft Plans.

## Overall Goal, Objectives and Benefits

The overall goal of the C&LM Plans is to advance the efficient use of energy, reduce air pollution and negative environmental impacts, and promote economic development in Connecticut.

Specific objectives to achieve the goal include the following:

- Lower energy costs and increase aggregate productivity through cost-effective C&LM initiatives;
- Create an energy efficiency "ethic" through communication of the economic and environmental value of efficient energy use;

- Increase measurable energy efficiency to position Connecticut businesses and organizations for success in the global economy;
- Provide a high quality program that meets customers' needs and that addresses market barriers to energy efficiency, especially for special needs groups;
- Allocate C&LM resources in an equitable manner across all customer segments;
- Pursue uniform Statewide programs between CL&P and UI;
- Pursue increased use of third party planning and delivery of programs;
- Demonstrate measurable success in achieving energy efficiency goals, in terms of environmental and economic improvement; and
- Seek linkages to other funds and environmental initiatives.

**Benefits**

The primary direct benefit to Connecticut of the Companies' C&LM program are electric energy savings, although a more energy efficient Connecticut produces many benefits. For example, the installation of energy efficiency measures results in energy savings for customers which, in turn, translate into savings on electric bills. These energy savings also reduce air pollution, enhance public health and protect the environment.

**Table 2. Energy Savings from Energy Efficiency Programs**

| Type of Savings | 2000 Savings | 2001 Savings (Projected) |
|---|---|---|
| **Energy Savings** | | |
| *Annual* | 251.9 million kWh | 265.9 million kWh |
| *Lifetime* | 3,702.6 million kWh | 4,013.5 million kWh |

**Table 3. Summary of 2000 Energy Savings by Customer Class**

| Customer Sector | Annual Savings (million kWh) | | Lifetime Savings (million kWh) | |
|---|---|---|---|---|
| | 2000[4] | 2001 | 2000 | 2001 |
| **Low Income** | 11.8 | 12.2 | 156.7 | 159.2 |
| **Residential (non L/I)** | 55.4 | 47.4 | 824.7 | 679.0 |
| **C&I** | 184.7 | 206.3 | 2,721.2 | 3,175.3 |
| | | | | |
| **TOTAL** | **251.9** | **265.9** | **3,702.6** | **4,013.5** |

[4] The UI appliance program year end data within Residential non-Low Income is not yet available and an estimate has been used.

A primary focus of the C&LM programs is to provide benefits of energy efficiency to Connecticut's economy. In particular, energy efficiency contributes to more productive methods and processes for thousands of businesses each year. C&LM programs can help to increase the economic viability of the State's businesses and organizations, which serves to make the Connecticut economy more competitive in local, regional, national and international markets.

Year 2001 programs will include load management and distributed resources pilot program initiatives that will take advantage of the emerging competitive electricity market through increasing load factors, aggregating customers' load to be bid into the ISO market for interruptible power, or locating more reliable and cost-effective resource options. These efforts will increase system reliability, mitigate market price volatility for participating customers, and reduce air pollution, especially during the peak summer months.

**Table 4. Demand Savings from Energy Efficiency Programs**

| Type of Savings | 2000 Savings | 2001 Savings (Projected) |
|---|---|---|
| **Demand Savings** *Annual* | 62,749 kW | 62,512 kW |

There are also direct benefits to third party C&LM providers and traditional energy service companies (ESCOs), trade allies, equipment vendors, and others, who participate in energy efficiency programs. These programs are intended to foster development of a third party C&LM provider industry that will gradually transition the economy toward reliance on the competitive marketplace rather than the electric distribution companies.

C&LM programs specifically designed for special needs groups such as low-income customers, small towns, distressed cities, State buildings, and small businesses, allow for substantial energy and financial savings. By focusing on special needs markets, such as municipal governments and State buildings, the programs improve specialized infrastructures that are utilized to support the State's economy. Reducing costs for customers such as these allows them to better provide services in other areas. Providing C&LM and education services to low-income customers, in particular, results in more money being available for other basic needs.

Finally, a research and development component has been developed that will greatly benefit the State of Connecticut. The research alone is likely to aid existing companies in the State and spawn additional research firms. The results of the research are to be primarily aimed at improving the energy efficiency and the environment of the State.

## Strategic Program Areas

The ECMB and the electric distribution companies generally agreed upon certain broad areas of concentration into which the majority of programs fall. These areas not only comply with the legislation but also ensure that certain equity considerations are met. One such measure of equity is the derivation of the conservation funds by sector versus programmatic expenditures for those same sectors. (See **Appendix B** for charts depicting the revenue sources and expenditures by sector and **Appendix C** for a table detailing program-by-program budgets.)

**Table 5. Distribution of Budget by Strategic Program Areas**

| | 2000 | | 2001 | |
|---|---|---|---|---|
| | **$ (000)** | **%** | **$ (000)** | **%** |
| | | | | |
| Market Transformation & Lost Opportunities | 43,958 | 58.5 | 38,867 | 51.9 |
| Technical Assistance, Education & Outreach | 7,325 | 9.8 | 6,146 | 8.2 |
| Special Needs Markets | 13,860 | 18.6 | 13,285 | 17.7 |
| Economic & Competitive Market Development | 3,377 | 4.5 | 7,071 | 9.4 |
| System Reliability & Load Management | 1,799 | 2.4 | 2,750 | 3.7 |
| Research, Development & Demonstration | 4,542 | 6.1 | 6,813 | 9.1 |
| Total | 74,861 | 99.9[5] | 74,932 | 100.0 |

### Market Transformation and Lost Opportunities

Market transformation efforts are strategic initiatives to induce lasting structural and behavioral changes in the marketplace that result in increased adoption and penetration of energy-efficient technologies and practices. Long-lasting, sustainable changes can be achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly funded intervention is no longer necessary in that specific market.

Market transformation efforts are also designed to minimize "lost opportunities" by fostering more efficient use of energy when it is most practical and least expensive to do so such as during new construction, renovation, or equipment replacement or purchase. Such opportunities would often be “lost” forever or until the next major building project or equipment purchase.

[5] Figures may not add up to 100% due to rounding errors.

**Residential Conservation and Load Management Case Study**

**The Challenge:** When UI was challenged with ramping up their programs this past year, there was some concern whether they could meet the ambitious goals set for them. During that same period, in March of 2000, T&M Homes, a firm with 30 years of experience from Torrington, was in the early stages of construction for "Milford Hunt," a new 62 unit single family home development in Milford, Connecticut. While originally planned to comply with the minimum State building codes for energy efficiency, UI proposed building the new homes to the higher Energy Star standards which are recognized for saving as much as 30% and more on home heating, cooling, lighting and appliance costs. UI's second challenge was to convince T&M Homes that the potentially higher costs of construction to reach Energy Star standards would not negatively affect sales of these homes.

**UI's Solution**: Through its Energy Star Homes program, UI assisted T&M Homes in paying for enhancements to reach Energy Star status. This help included assistance for home energy rating, HVAC system design, improvements in air sealing, help with testing and incentives for increased efficiency of cooling systems, appliances and lighting.

UI marketing representatives also demonstrated to T&M Homes that several energy efficient upgrades, through changes in building practices, could help pay for themselves if not actually reduce building costs. Finally, UI's Energy Star Homes team developed a comprehensive package of marketing and sales support, as well as, technical training for construction personnel.

As a result T&M Homes signed an agreement with UI to build 54 of the 62 planned single family homes at Milford Hunt to Energy Star standards. An additional bonus was that marketing efforts in support of these Energy Star Homes received extensive media coverage resulting in increase awareness of Energy Star Homes and Milford Hunt, thereby realizing additional benefit to the builder and the general public.

In November of 2000, the Connecticut Home Builders Association named Milford Hunt, Energy Efficient Community of the Year. This award created additional recognition for T&M Homes within the building industry and also provided additional third-party validation of the homes' value for consumers and the Energy Star Homes program.

## Technical Assistance, Information and Outreach

In an effort to create an "energy efficiency ethic" in Connecticut, the Plans continue a broad-based, coordinated advertising and marketing campaign that will raise customer awareness of the value of energy efficiency. The programs provide customers with the technical and financial information necessary to make informed decisions on selecting energy efficiency measures, acquiring energy efficient equipment and services. These efforts will be continued and in some instances expanded to be consistent with the increased programmatic expenditures and the market transformation objective.

**Special Needs Markets**

While all customer classes, sectors, and geographic areas will receive substantial benefits as a result of the Companies' various C&LM programs, some resources will be targeted toward energy-using sectors least likely to be served as a result of the industry's transition to a retail competitive market. These sectors include low-income customers, State government, and municipal governments - including Urban Act cities. Targeting resources to these groups not only benefits them directly, it also provides real value to all ratepayers and to all citizens of Connecticut. By lowering energy costs for the State, cities, and towns, for instance, energy efficiency efforts free up money that can be used to provide other services - such as road repairs, school improvements, and police and fire protection.

Low-income consumers benefit directly by having more money available for food and other necessities, a safer, healthier, more comfortable home, fewer lost days from work; and greater ability to pay their energy bills. By lowering energy bills for low-income customers, ratepayers save on the costs of arrearages, bill collection, disconnects, reconnects, lost contribution to company costs, and administrative costs. The Low Income Energy Care program provides a full range of conservation measures to address lighting, water heating, inefficient heating equipment, refrigeration, insufficient insulation and weatherization. Since many dwellings are not heated by electricity, allowance is made to upgrade fossil fuel heating sources with some services coordinated with local gas distribution companies. Efforts have also been made to reach persons for whom other factors interfere with their ability to access other programs. Examples include those living in group settings such as residential treatment facilities, group homes, halfway houses and shelters.

**Economic and Competitive Market Development**

A major focus of past C&LM activities has been to provide economic development benefits to the State economy. A significant portion of historic expenditures was invested in commercial and industrial markets, and most of the Companies' economic development packages for customers have included C&LM initiatives. The deregulation of the electricity market places greater emphasis on the use of C&LM activities for economic and competitive market development for the business community in Connecticut.

The ECMB and its consultants have been working with the Companies to develop third party C&LM provider industry initiatives and programs. While some programs already stimulate the energy services industry by utilizing vendors to deliver C&LM programs, there are now plans to increase emphasis on third party programs. These activities will supplement the successful RFP developed in 2000, but may not be ready to implement completely in 2001. The ECMB believes that innovation in program delivery is essential, but that it is as important to ensure quality in the delivery of programs.

The programs incorporate energy efficiency in new construction and major renovation occurring in the State, when the opportunity to do so is most economically feasible. By helping new organizations and existing customers use electricity as productively as possible, the programs enhance the competitive position of Connecticut's business community. The failure to take advantage of the economics of energy efficiency during construction projects represents "lost opportunities " for the entire State.

**Large Company Case Study**

**The Challenge:** Johnson & Johnson Medical, employing some 550 people at its 129,000 square foot production facility in Southington, Connecticut, manufactures a protective line of intravenous catheters designed to guard healthcare workers from accidental exposure to deadly disease.

The production departments use compressed air to power various equipment and operations to manufacture more than 110 million pieces of medical devices each year. This system expanded with the production plant without the benefits of reconfiguration for optimal energy efficient operation.

**The CL&P Solution**: Working with CL&P's exclusive Custom Services Program, which provided technical assistance and cash incentives to Johnson & Johnson Medical in order to save the company energy dollars, they turned their existing inefficient compressed air system into a state-of-the-art, innovative efficient control system that today is saving the company one-third of its past compressed air electric energy costs exceeding $89,000 in annual savings. Through this and other CL&P-sponsored energy innovations, modifications and recommendations, Johnson & Johnson Medical is now saving more than $119,000 on its annual CL&P bill.

Today Johnson & Johnson Medical is manufacturing more medical devices using less electricity, increasing the company's overall profit margin. And improved efficiency and increased productivity resulted in Johnson & Johnson Medical reducing their overall operating and maintenance costs. Subsequently, the Southington plant is now being used as a model for energy efficiency for other Johnson & Johnson facilities across the country.

**System Reliability & Load Management**

The deregulation of wholesale power markets throughout the Northeast region has caused price signals for power purchased from neighboring utilities and other power suppliers to be much more unpredictable than in the past. Prices for power purchased during constrained periods has proven to be much higher than those prices set through regulation in New England. In the future, distribution companies and their customers face significant price increases for the power purchased to meet temporary shortages. In this context, load management programs could offer benefits to customers, the transmission and distribution (T&D) system, the community at large and the environment. Multi-year pilots for load management began in 2000 and there are plans to continue these for 2001.

Due to an increase in emphasis among policy makers on system reliability from C&LM in the restructured industry, the ECMB is also evaluating and supporting distributed resources projects in the RD&D program.

**Importance and Benefits of Load Management**

The deregulation of wholesale power markets across the Northeast has caused price signals for power purchased from neighboring utilities and other power suppliers to be much more variable than in the past. Prices for power purchased during tight load-resource balance periods have proven to be much higher than those prices set through regional regulation in New England during similar situations. Therefore, some of the distribution companies' customers could face significant price increases for the power purchased to meet temporary shortages. The summer price spikes of 1999 in New England and the recent reliability problems in California are indicative of the risks facing ratepayers during periods of short supply.

When customers' demand exceeds supply, the first line of defense is to contractually arrange for some customers (usually the largest ones and/or ones with on-site emergency generation) to reduce or interrupt their loads. If customers' response fails to provide adequate load relief, the next line of defense is to employ a series of measures that could strain company-customer relationships and may ultimately drive delivery prices upward. The last "control" approach is where the grid "sheds" or "drops" load during emergency times on an involuntary basis, which is what happened in California in recent weeks.

In this context, programs are being offered that attempt to help foster "price responsive loads," meaning that customers participate in such markets based upon their willingness to reduce load in return for compensation at desired prices.

The role of the distribution companies in facilitating this new and beneficial type of interruptible-load supply (ILS) programs is important, since electricity markets and associated infrastructures and technologies are still developing. The benefits to be expected from successful development of markets for price responsive loads are worth pursuing. Such benefits include: (1) increased system reliability, (2) reduced price volatility, (3) a more elastic demand curve for electricity, (4) market power mitigation, (5) delayed need for new power supply and (6) lesser environmental impacts. These benefits can accrue to all segments of society.

**Benefits to the Environment**

When the demand for electricity peaks and the supply system is constrained or limited, suppliers are likely to bring on line less efficient resources with relatively high emission rates, e.g., oil-fired combustion turbines. While generally needed for only a short time, such peaking facilities SOx and NOx and particulate emissions at high rates. Moreover, the increase in emission rates tends to occur during the high-load hours of summer afternoons when ambient air quality is at its worst. By developing load management resources, the Companies strategically positions themselves to help alleviate this environmental burden.

**Benefits to the Transmission System**
Load management strategies that reduce load temporarily or shift on-peak demand to off-peak periods are expected to play an increasingly important role in facilitating the operational efficiency and reliability of the system particularly in areas experiencing transmission transfer capability limitations. Among the immediate transmission benefits are a lowering of congestion costs and charges, increased service reliability and, in the long-run, lowering firm transmission rights.

**Load Management Programs**
In order to acquire the capability for the market to deliver effective price responsive load management, CL&P will implement pilot load management programs to determine, under actual conditions, what strategies will produce economic and practical resources. By placing emphasis on developing the required market information, full implementation of the load management capabilities can be more rapidly executed during a multi-year time horizon.

**Research, Development & Demonstration**

**Goals and Objectives**
Sustainable progress in C&LM in Connecticut depends on the vigorous support of RD&D efforts to develop new technologies and related efforts to facilitate the movement of state-of-the-art technologies into Connecticut markets through field testing, evaluation, information dissemination, and innovative strategies to promote private sector involvement. As new technologies become available, they will be incorporated into the other C&LM programs. In year 2000, CL&P and UI operated separate RD&D programs but will be participating in a common program during 2001. Based upon the Department's directive in Docket No. 99-09-30 and input from the ECMB and the Policy Working Group of the RD&D program, there is an emphasis on distributed resources within RD&D. The program provides an opportunity to effectively support the development of C&LM technologies that can provide broad benefits to Connecticut's electric customers, but would not otherwise be undertaken adequately by private market participants because of long, uncertain, or diffuse economic returns.

**Benefits of a Connecticut RD&D Program**
Public benefits of the RD&D program include enhanced environmental quality, reduced energy consumption, improved system reliability, and sustainable reductions in energy costs to ratepayers across all customer classes. In addition, the program advances economic development in Connecticut by directly supporting and encouraging the growth of research activities within the State and through public-private partnership demonstration programs which can enhance the energy efficiency, productivity and competitiveness of commercial and industrial facilities in the State.

**RD&D Progress in 2000**
The efforts in 2000 focused on identifying energy efficiency categories in need of RD&D and setting up the RD&D organization. Progress was then made in implementing an

advisory group, issuing a request for proposal and establishing predetermined criteria for selection of projects. This was followed by evaluating proposals on a consensus basis using the predetermined criteria, developing strategy for leveraging the use of the RD&D funds and awarding contracts for a broad range of RD&D projects. There has also been development of performance indicators for evaluation of the projects. (A list of projects and dollar amounts awarded in year 2000 are in **Appendix D**.)

In the first half of 2000 a Policy Working Group (PWG) with broad representation and diverse skills was established to support R&D efforts. The PWG meets on a regular once a month basis and more frequently during the proposal review period. The PWG works at a minimum of six days per year and members perform their work as a public service.

**Plans for 2001**

With a very successful in start-up of the RD&D efforts in 2000, there are plans to build off that foundation for the year 2001. In addition, UI will allocate a significant budget to the RD&D program for 2001.

The largest single category of responses to the RFP was for projects in the distributed resources category. While the companies intends to continue requesting proposals and funding projects in "typical" efficiency categories, plans are to pursue a role in DR research and development, if projects can be identified which address high-value markets with cost effective technologies.

The Companies and the Board also intend to address the issue of intellectual property rights in 2001. Developing and implementing a strategy for the fiduciary responsibilities for program administration that are appropriate will be explored during the contracting phase of the first round of projects.

## Cost Benefit Analysis

### Background

Connecticut Public Act 98-28 requires that energy efficiency programs be "screened" through cost-effectiveness testing which compares the value and payback period of program benefits to program costs to ensure that programs are designed to obtain energy savings whose value is greater than the costs of the programs."

### Methodology

Two different tests were conducted by each utility, the Electric System Test and the Total Resource Test or Societal Test. The *Electric System Test* includes costs and savings that are realized in the electric bills of the customers of the electric distribution company.

The *Total Resource Test* (used by CL&P) includes all identifiable and directly quantifiable economic costs and benefits of the programs. In addition to the Companies' costs to implement the programs, it includes the cost of the efficiency investments made

by participating customers. In addition to the electric benefits, this test includes other participant benefits. Examples are savings in other resources such as water, gas, or oil and the cost of equipment replacement avoided through the installation of equipment with a useful life longer than that of standard efficiency. Other benefits to participants that are directly quantifiable may also be included. The Societal Test (used by UI) also includes factors for less identifiable indirect participant benefits in economic development, pollution abatement, and low-income ability to pay.

**Table 6. Components of the Three Benefit Cost Tests**

| | Electric System | Total Resource | Societal |
|---|---|---|---|
| **Costs** | | | |
| Company Cost | **X** | **X** | **X** |
| Participant Cost | | **X** | **X** |
| | | | |
| **Benefits** | | | |
| Electric Generation Savings | **X** | **X** | **X** |
| Electric T&D Savings | **X** | **X** | **X** |
| Non-Electric Participant Savings | | **X** | **X** |
| Other Savings* | | **X** | **X** |
| Low Income Program Benefits* | | **X** | **X** |
| Environmental Benefits % Adder | | | **X** |
| Economic Benefits % Adder | | | **X** |

The results of the analysis are summarized in the following table. More detailed information can be found in **Appendix E**:

**Table 7. Cost-Effectiveness of Year 2000 Energy Efficiency Programs**[6]

| Customer Sector | Benefits (million $) | Costs (million $) | Net Benefit (million $) | Benefit/Cost Ratio |
|---|---|---|---|---|
| Low-income | 4.881 | 6.201 | -1.32 | .79[7] |
| Residential (non L/I) | 22.384 | 19.048 | 3.336 | 1.18 |
| C&I | 76.516 | 43.484 | 33.032 | 1.76 |
| Total | 103.781 | 84.184[8] | 19.597[8] | 1.23 |

* Other benefits may be included if directly quantifiable.

[6] Results presented here are from the Electric System Test.

[7] When all non-electric benefits are accounted for, the 2001 low-income programs are projected to be cost-effective.

[8] Note: These figures are not the additive result of the preceding figures in the columns. The cost total also includes non-program specific administrative and management fees.

## Monitoring and Evaluation

Monitoring and evaluation (M&E) activities will determine whether or not the 2001 programs are producing the results intended. By making use of pertinent findings and conclusions drawn by others and which are transferable, costs can be kept to reasonable levels while still producing credible results.

M&E activities are typically characterized by having many of the following features:

- A computerized tracking system. Examples of events to be tracked range from individual compact fluorescent (CFL) bulb installations to large and complex energy systems.

- A baseline or benchmark assessment of current market conditions for the appropriate energy products and services.

- Process evaluations will investigate qualitatively how the market views a given program or sub-program.

Impact evaluations will be designed to determine the effect the program has had on some variable or set of variables, such as energy consumption or electric demand reduction. These can be simple, single building before and after consumption comparisons, or highly complex multi-customer studies of participants and non-participants employing sophisticated sampling techniques, combined with engineering estimates, on-site visits or surveys. With accepted statistical methods these are used to strengthen the true effects of program offerings.

## Issues to be Addressed in 2001

As the Board continues its activities in its second year, it faces many challenges, opportunities and barriers which it must address to make both the process and the programs more productive, cost-effective and available to a greater number of ratepayers.

- **Construction of a second and possibly third energy efficiency center**. The existing SmartLiving Center in the CL&P service territory in Newington has proved to be an exciting and useful way to demonstrate to residential consumers the broad choices now available to them in energy efficient products. This center will be joined this year by a sister facility located in the UI's service territory to better reach all consumers. The need for a third center will also be explored.

- **Creating synergies with CT Clean Energy Fund, Rebuild America, Energy Conservation Loan Fund and other entities**. The electric distribution companies are not the only organizations which have energy efficiency improvements as their

goal. The Board believes that there is a large potential to work effectively with other programs to leverage resources and open new programmatic distribution channels.

- **Addressing areas of potential overlapping responsibilities, such as distributed generation.** Distributed generation is the use of small, widely dispersed on-site generation units (such as fuel cells) which are interconnected to the grid and can provide load reduction characteristics. The ECMB and the utilities have begun investigation of their benefits and liabilities and whether it might be appropriate to integrate them into existing or new programs or to leave them to other organizations such as the Clean Energy Fund or the market.

- **Role and depth of Distributed Resources and renewables.** The majority of the involvement in DR and renewables by the Board to date has taken place within the confines of the RD&D sector. The Board will explore further involvement that may be warranted through integration into one or more existing programs.

- **Continued movement toward third party programs.** The DPUC in its decisions instructed movement in this direction and the Board believes it has made significant progress in meeting this goal. Continued effort must be made to further these goals while not jeopardizing cost-effectiveness of existing programs.

- **Load management.** The power shortage experience in California has placed renewed emphasis on load management as a useful tool to help ameliorate what could be serious supply deficit situations. Continued testing of residential load shedding systems and industrial load shedding cooperatives will continue through the summer.

- **Exploring greater loss mitigation tie-ins which motivate sales in energy efficient products**. The phenomenal success of the halogen torchiere turn-in program has indicated that personal safety and loss mitigation can become powerful marketing tools for energy efficiency. Lawrence Berkeley National Lab has, in addition to halogen torchieres, identified over 70 additional measures which utilize mitigation of property loss and safety as drivers for energy efficiency. An example is the insulating of attics to prevent heat loss which also mitigates costly ice-dams. These will be explored in 2001.

- **Fostering greater public participation and availability of web information.** The Board was extremely pleased with the dialogue with interested parties and their willingness to share new ideas, some of which have been incorporated into the programs. The Board seeks to nurture this valuable resource even more through a variety of ways including an enhanced web presence by mid-year.

- **Movement toward identical programs.** The Department has indicated that it wishes to see all programs offered by CL&P and UI to be identical for the year 2002 Plan. It will take a concerted effort by all parties to extract the best elements of both Companies' programs to this design challenge.

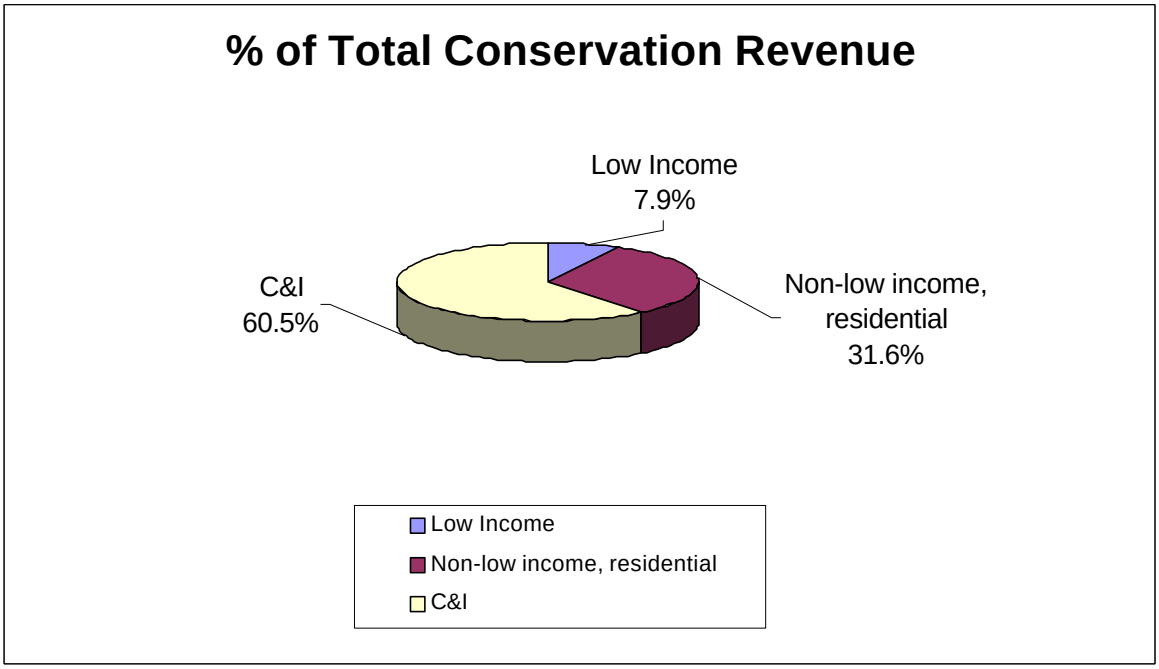
- **Comprehensive Monitoring of Performance.** The Board and its consultants have worked with the electric distribution companies to broaden the span of performance indicators and metrics used to assess program performance. The Board will need to review, interpret and communicate this data to improve programs and guide strategic development.

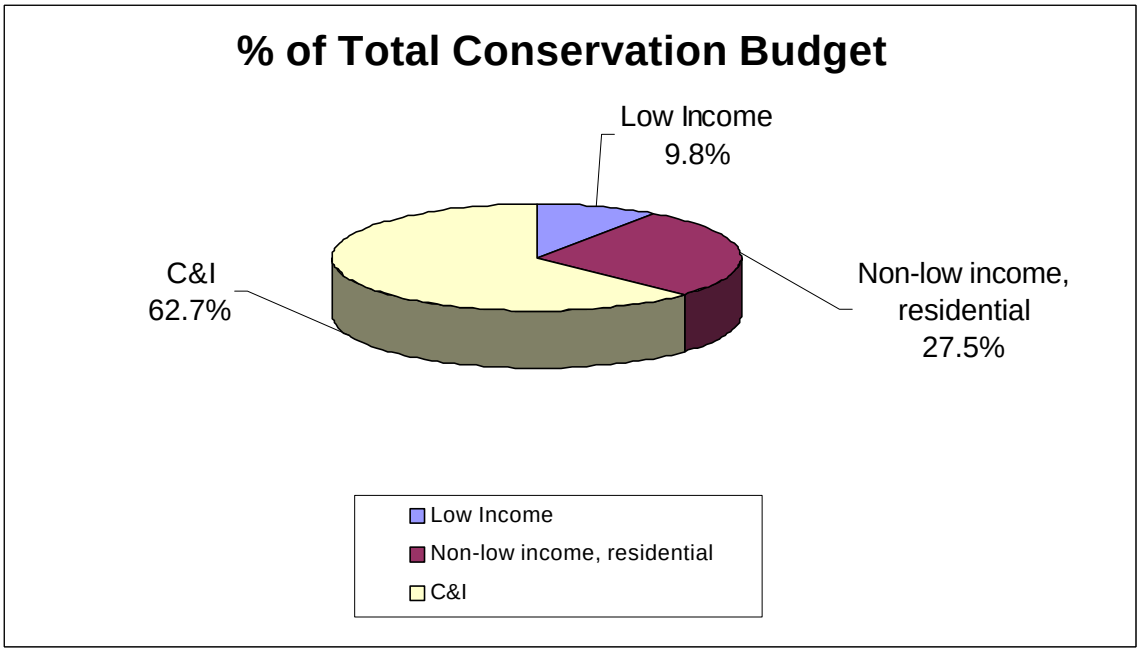
# Appendix A

**Energy Conservation Management Board Members**

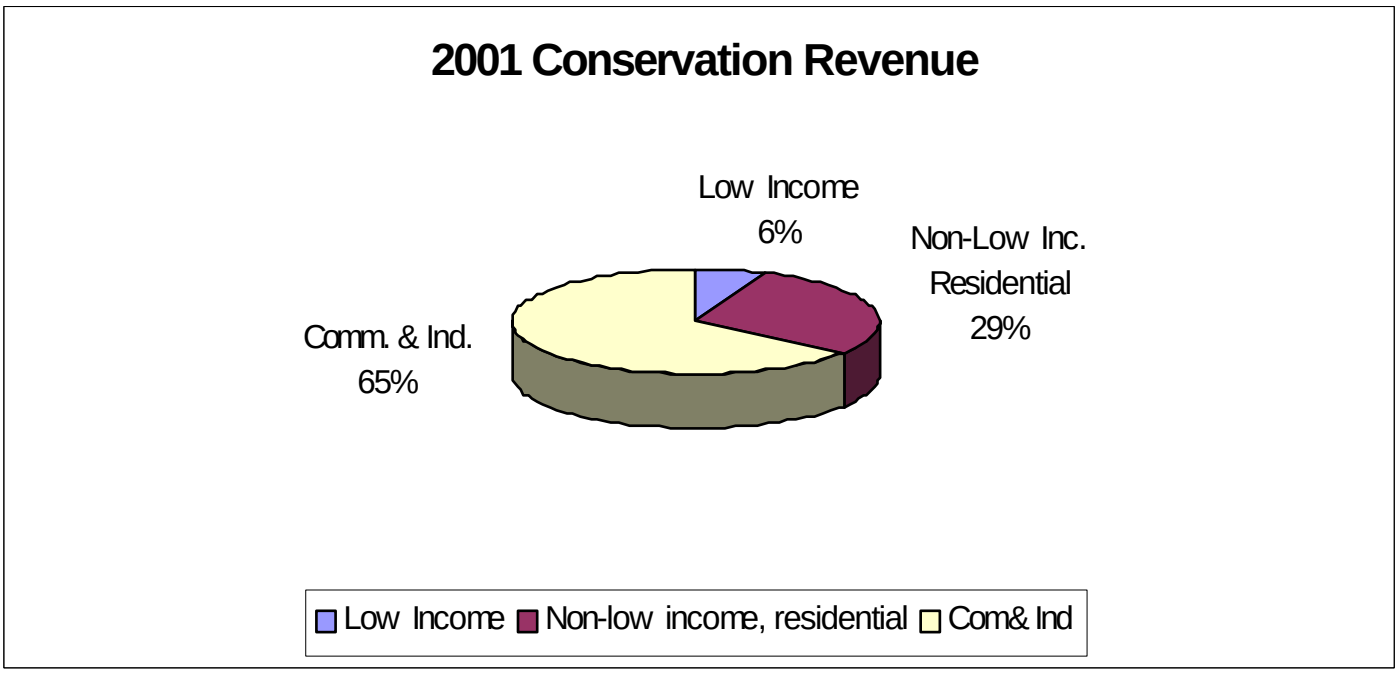
| | |
|---|---|
| Mr. Daniel L. Sosland, Esq.<br>Environment Northeast<br>P.O. Box 313<br>Rockport, ME 04856 | Mr. Daniel Moore<br>Senior Director of Public Relations<br>MetroHartford Chamber of Commerce<br>250 Constitution Plaza<br>Hartford, CT 06103 |
| Mr. Michael Wertheimer, Esq.<br>Assistant Attorney General<br>Office of the Attorney General<br>10 Franklin Square<br>New Britain, CT 06051 | Mr. John Rathgeber, Executive VP<br>Connecticut Business & Industry Assoc.<br>350 Church Street<br>Hartford, CT 06103 |
| Mr. Richard Steeves<br>Consumer Counsel<br>10 Franklin Square<br>New Britain, CT 06051 | Mr. Tim Phelen<br>CT Retail Merchants Assoc.<br>60 Forest Street<br>Hartford, CT 06105 |
| Mr. Christopher James /Mr. Carmine DiBattista<br>Department of Environmental Protection<br>79 Elm Street<br>Hartford, CT 06106-5127 | Ms. Shirley Bergert, Esq.<br>Connecticut Legal Services<br>P.O. Box 258<br>Willimantic, CT 06226 |
| Mr. Philip H. Turner, Ph.D.<br>The United Illuminating Company<br>157 Church Street<br>New Haven, CT 06506 | Mr. Michael Townsley<br>The Connecticut Light & Power Company<br>66 Curtis Street<br>New Britain, CT 06052-1326 |
| Mr. Frank J. Johnson<br>Manufacturers Alliance of Connecticut<br>1525 Hamilton Avenue<br>Waterbury, CT 06706 | Ms. Cindy Jacobs (attendee)<br>Department of Public Utility Control<br>10 Franklin Square<br>New Britain, CT 06051 |

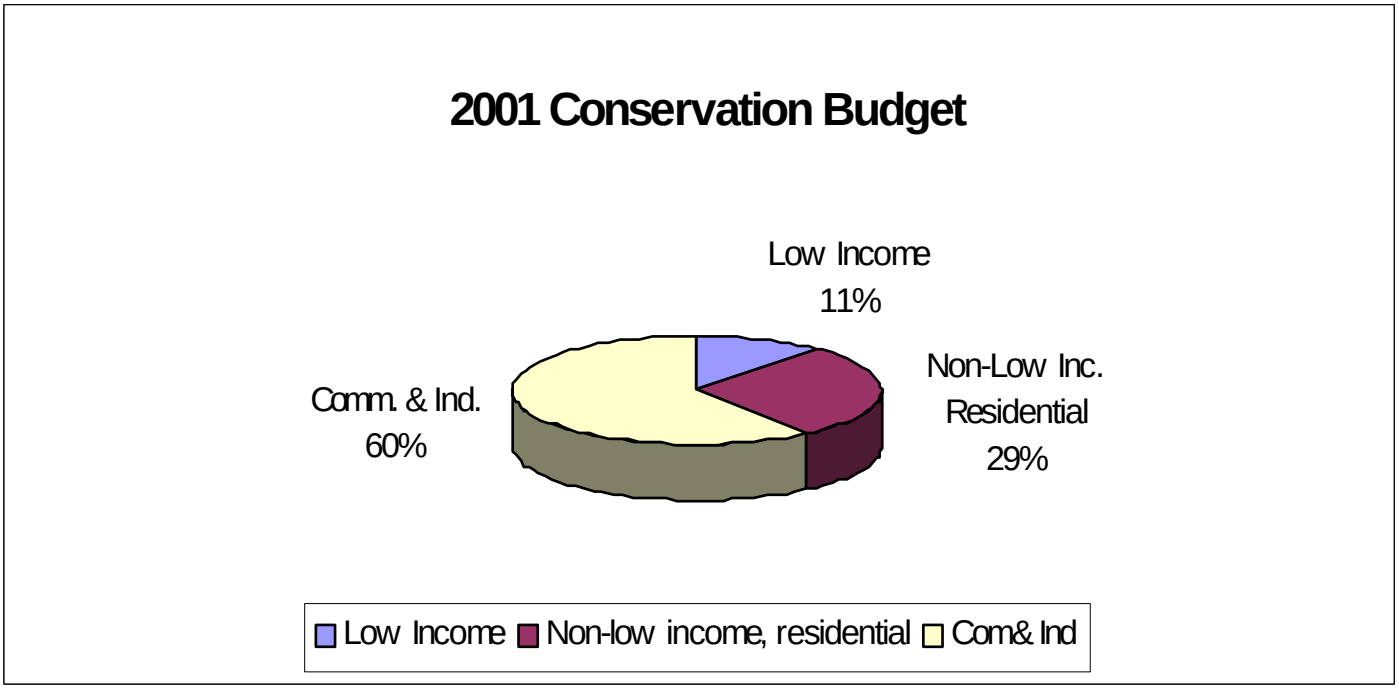
## CL&P 2001 Program Revenues and Budget by Sector



**UI 2001 Program Revenues and Budget by Sector**



## Appendix C. CL&P and UI Company Actuals and budgets for 2000 and 2001.

| CL&P Program Name | UI Program Name | CL&P 2000 Actuals (000's) | CL&P 2001 Budget (000's) | UI Actuals (000's) | UI 2001 Budget (000's) |
|---|---|---|---|---|---|
| **MARKET TRANSFORMATION** | | | | | |
| **Residential** | | | | | |
| Smart Living Catalog | | $ 2,426 | $ 2,676 | $541 | $580 |
| Retail Lighting | Energy Star Lights | $ 4,016 | $ 2,463 | $1,462 | $947 |
| Tumble Wash | | $ 1,259 | $ 823 | | |
| Energy Star Appliances | Energy Star Appliances | $ 226 | $ 276 | $914 | $794 |
| Energy Star New Construction | Energy Star Homes | $ 1,508 | $ 1,315 | $513 | $536 |
| Hot Shot HPWHs | "Hot Shot" Heat Pump | $ 3,328 | $ 1,923 | | $120 |
| Residential HVAC | Residential HVAC | $ - | $ 500 | | $104 |
| New Construction GeoX | | $ - | $ 530 | | |
| **Commercial/Industrial** | | | | | |
| New Construction | Energy Blueprint | $ 6,884 | $ 7,770 | $3,058 | $2,125 |
| Custom Services | | $ 10,575 | $ 7,413 | | |
| Express Service | | $ 947 | $ 1,500 | | |
| | Cool choice | | | $121 | $77 |
| | Motors | | | $74 | $59 |
| | Energy Opportunities | | | $3,487 | $2,559 |
| Small Customer Energy Advantage | Small Business Advantage | $ 1,416 | $ 2,450 | $1,203 | $1,327 |
| **Sub Total Market Transformation** | | $32,585 | $29,639 | $11,373 | $9,228 |
| | | | | | |
| **RFP Program** | RFP Program | $ 2,978 | $ 5,700 | $399 | $1,001 |
| **O&M RFP** | | $ - | $ 200 | | $170 |
| **LOAD MANAGEMENT** | | $ 1,799 | $ 2,750 | | |
| | | | | | |
| **RESEARCH, DEVELPMNT & DEMONSTRATION*** | | $ 4,226 | $ 5,543 | $316 | $1,270 |
| | | | | | |
| **SPECIAL NEEDS** | | | | | |
| Schools* | K-12 Education | $ - | $ 200 | $392 | $427 |
| Energy Conservation Loan Program | | $ 277 | $ 300 | | |
| Low Income(Energy Care & WRAP) | UI Helps | $ 4,406 | $ 5,000 | $1,795 | $1,519 |
| Community Based Program | | $ - | $ 250 | | $402 |
| State Buildings Program | | $ 2,311 | $ 1,000 | | |
| Municipal Buildings Program | Municipal Energy | $ 3,762 | $ 3,200 | $918 | $987 |
| **Sub Total Special Needs** | | $10,755 | $9,950 | $3,105 | $3,335 |
| | | | | | |
| **TECHNICAL ASSISTANCE, INFO AND OUTREACH** | | | | | |
| Residential | | | | | |
| SPECTRUM Program | | $ 1,437 | $ 1,225 | | |
| Energy Value Water Heating | | | | | |
| Tech Centers (SmartLiving Center) | | $ 621 | $ 1,048 | $307 | $420 |
| General Non-Program Communication | | $ 519 | $ 700 | | |
| Residential Audits-Non WRAP | | $ 1 | $ 32 | | |
| | | | | | |
| **Commercial/Industrial** | | | | | |
| Committed EAP | | $ 32 | $ - | | |
| General Non-Program Communication | | $ 747 | $ 300 | | |
| O&M Services | | $ 3,663 | $ 2,421 | | |
| **Sub Total Technical Assistance** | | $7,018 | $5,726 | $307 | $420 |
| | | | | | |
| **Other Expenditures** | | | | | |
| Administration | | $ 1,426 | $ 1,125 | | |
| **Planning and Evaluation** | | $ 1,768 | $ 1,700 | $277 | $446 |
| ECMB | | $ 73 | $ 250 | $81 | $150 |
| Information Technology | | $ 963 | $ 1,200 | | |
| **Sub Total Other Expenditures** | | $ 4,230 | $4,275 | $358 | $596 |
| **TOTAL EXPENDITURES** | | $63,591 | $63,783 | $15,858 | $16,020 |
| | | | | | |
| Performance Management Fee | | $ 3,557 | $ 5,103 | $1,178 | $1,270 |
| | | | | | |
| **GRAND TOTAL** | | $67,148 | $68,885 | $17,036 | $17,290 |

# Appendix D

## RD&D Contracts Awarded in 2000

In 2000, the Research, Development and Demonstration Group awarded fourteen RD&D projects totaling $4 million. These projects support the advancement of efficient use of electricity in Connecticut and cover a wide variety of technologies. Projects were selected based on considerations of energy efficiency, environmental benefits and system reliability. A summary of each project including the dollar amount follows:

1. **Improved Fuel Cell Plate Manufacture**: Development of a complete, easily manufactured, fuel cell system based upon bipolar separator plate technology. Allen Engineering Company, Inc., Waterbury, CT. *$1,200,000*
2. **Strategic Asset Optimization Software Application**: Development of a planning model to identify geographic areas and customers that are served by circuits and substations that may have a surplus or excess of capacity, loads and reserves. This model can then identify locations and customers where demonstration sites of new technology such as fuel cells, microturbines and other forms of distributed generation may have the greatest value. EPRIsolutions, Palo Alto, CA. *$299,398*
3. **Free Piston Engine-Generator**: Research and development of an unconventional prototype internal combustion engine with the potential to double the efficiency of conventional engines using natural gas as a fuel. Galileo Research, Inc., Norfolk, CT. *$250,000*
4. **Waste Water Hydro-Power System**: Research the practicality and cost effectiveness of providing hydroelectric co-generation systems at water and wastewater plants. Bricar Engineering Associates, LLC, Bristol, CT. *$218,000*
5. **Fuel Cell Design and Analysis**: Feasibility study to support the demonstration of a fuel cell as a distributed resource at a State of Connecticut office building. State of Connecticut DEP/DPW, Hartford, CT. *$125,000*
6. **High-Tech Centrifugal Compressor for Commercial Air Conditioning and Refrigeration Systems**: Research and develop the adaptation of technologies developed in the aerospace industry to commercial air conditioning and refrigeration. A highly efficient oil free centrifugal compressor has the potential to significantly reduce electricity consumption and uses zero ozone depletion refrigerant. R&D Dynamics Corp., Bloomfield, CT. *$450,000*
7. **Smart Energy Management System**: Development of an energy monitoring system to apply technology in a novel manner to the process of cost effectively managing energy consumption in buildings. AutoGnomics Corp., Norwich, CT. *$300,000*

8. **Integrated Refrigerator and Water Pre-Heater**: Development of an integrated refrigerator/water pre-heater that recovers waste heat form the refrigeration cycle and uses it to heat water. Energy can be saved by reducing the energy consumption of the water heater and lowering the condensing temperature of the refrigerator. Arthur D. Little, Inc., Cambridge, MA. *$250,000*
9. **Improved Energy Efficient Photosensor Lighting Control**: Develop and demonstrate an improved lighting control sensor that accurately measures interior light levels and adjusts the dimmable lighting system accordingly. RPI Lighting Research Center, Troy, NY. *$248,179*
10. **Direct GeoExchange Ground Source Heat Pump System**: Demonstrate and evaluate Direct GeoExchange systems which circulates non-ODP refrigerant through copper pipes installed in holes drilled in the earth. ECR Technologies, Inc., Lakeland, FL. *$198,750*
11. **Energy Efficient Hybrid Skylight**: Development of a hybrid sky-lighting/electric lighting system designed to combine a sky-light with electric lighting and photo-sensor to moderate electric light levels. RPI Lighting Research Center, Troy, NY. *$149,286*
12. **Intelligent Adaptive Defrost Controls for Commercial Refrigeration Systems**: Demonstration and evaluation of microsensor based system upgrade which optimizes staggered defrost loading, increases time between defrost cycles and provides "blackout" periods during high shopping intensity. Johnson Controls/Encore, Kennesaw, GA. *$99,892*
13. **Energy Efficient CRT Display**: Development of a high resolution Cathode Ray Tube (CRT) that uses electrostatic deflection rather than electromagnetic deflection which has the potential to reduce electric energy consumption by as much as 25%. Electron Optics Development Co., LLC, Trumbull, CT. *$89,158*
14. **Reduced Glare Window Glazing**: Research a new way of reducing glare by means of incorporating Neodymium Oxide into glass glazing and window material to filter out excess yellow light. Reduction of sun glare will maximize the effectiveness of photosensor day lighting control installations. Daniel Karpen Professional Engineer & Consultant, P.C, Huntington, NY. *$74,000*

# Appendix E

## Appendix E. 2001 Programs Benefit/Cost Ratios

| CL&P Program Name | UI Program Name | Electric System Ben/Cost Ratio CL&P | Electric System Ben/Cost Ratio UI Co | Tot Resource Ben/Cost Ratio CL&P | Societal Test Ben/Cost Ratio UI Co |
|---|---|---|---|---|---|
| **Residential Programs** | | | | | |
| Electric Heat | | 1.0 | | 1.0 | |
| Energy Star New Construction | Energy star Homes | 1.2 | 0.17 | 1.7 | 1.69 |
| "Hot Shot" Heat Pump | "Hot Shot" Heat Pump | 1.6 | 0.35 | 1.4 | 0.46 |
| Residential HVAC | Residential HVAC | 1.7 | 0.22 | 1.5 | 0.3 |
| New Construction GoeX | | 1.9 | | 1.9 | |
| Retail Lighting | Energy Star Lights | 2.7 | 1.54 | 2.5 | 1.9 |
| Smart Living Catalog | | 1.8 | | 1.2 | |
| | Energy star Appliances | | 1.21 | | 0.72 |
| Tumble Wash | | 0.7 | | 1.0 | |
| Low Income (WRAP) | UI Helps | 0.7 | 0.95 | 1.4 | 1.76 |
| Energy Conservation Loan Program | | 0.1 | | 0.1 | |
| Residential Audits (Non-Wrap) | | 0.5 | | 0.3 | |
| **Total Residential (1)** | | 1.2 | 1.07 | 1.8 | 1.36 |
| **Commercial and Industrial Programs** | | | | | |
| Competitive Market development | RFP Program | 3.7 | 1.28 | 2.1 | 0.82 |
| Custom Services | | 2.8 | | 2.7 | |
| Express Services | | 4.2 | | 4.2 | |
| | Cool Choice | | 0.41 | | 0.56 |
| | Motors | | 0.86 | | 1.17 |
| | Energy Opportunities | | 2.18 | | 1.52 |
| Small Customer Energy Advantage | Small Business Advantage | 2.4 | 1.31 | 1.3 | 1.09 |
| New Construction | Energy Blueprint | 3.5 | 2.46 | 3.5 | 3.27 |
| O&M Services | | 3.2 | | 3.2 | |
| Municipal Buildings | Municipal Energy | 1.3 | 1.91 | 1.1 | 1.88 |
| | K-12 Education | | 0.14 | | 0.13 |
| State Office Buildings | | 2.7 | | 1.6 | |
| **Total Comm. & Ind. (2)** | | 3.0 | 1.85 | 3.0 | 1.88 |
| **Load Management** | | 3.8 | | 1.6 | |
| **Total Program (3)** | | 1.9 | 1.2 | 2.1 | 1.26 |

**Notes:**
(1) Includes all budgeted Residential expenditures
(2) Includes all budgeted C&I expenditures
(3) Includes all budgeted expenditures and performance incentive.