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The United Illuminating Company

Year 2001

Conservation and

Load Management Plan

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CHAPTER ONE

OVERVIEW

Overall Goal, Objectives and Benefits

Connecticut Public Act 98-28, An Act Concerning Electric Restructuring, signed into law by Governor John G. Rowland on April 29, 1998, significantly altered the shape and nature of the electric utility industry in Connecticut. The Act unbundled the generation function from the distribution and transmission functions of the state's investor-owned electric utilities and opened generation services to retail competition and consumer choice in the year 2000. Recognizing the important role energy conservation can play in the restructured industry, the Connecticut General Assembly provided increased funding for utility-sponsored energy conservation and load management (C&LM) efforts. This plan sets forth a proposal by The United Illuminating Company (UI) to implement Section 33 of Public Act 98-28, now codified as Connecticut General Statute 16-245m. This law provides a .3 cents/kWh surcharge on electricity sales by the distribution companies to support programs, which encourage the efficient use of energy and promote a cleaner, healthier environment.

This is the second plan submitted by UI under the restructuring legislation. The first plan was developed for the year 2000 with assistance of the Energy Conservation Management Board (ECMB), which was also established by Public Act 98-28. The Plan for 2000 was finally submitted to and reviewed by the Department of Public Utility Control (the Department) in Docket No. 99-10-18. The Department issued its Final Decision approving UI's plan with modifications on June 14, 2000 ("Decision"). This Plan for 2001 incorporates lessons learned from implementation of the 2000 Plan, the newest strategic information developed by UI and the ECMB, as well as the Decision's directives for 2001. The Decision directed UI:

- To develop identical residential and small commercial and industrial programs with The Connecticut Light and Power Company (CL&P);
- To explore third party C&LM program planning and delivery; and
- To address alternative cost-effectiveness and performance incentive methodologies.

The overall goal of this Plan is to advance the efficient use of energy, to reduce air pollution and the negative environmental impacts associated with energy production and delivery, and to promote economic development in Connecticut.

Specific objectives to achieve these goals 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 benefits of efficient energy use;
- Provide a high quality program that meets customers’ needs and that addresses market barriers to energy efficiency across all market sectors;
- Sponsor Research, Development and Demonstration of new energy efficient technologies, products or processes;
- Allocate C&LM resources in an equitable manner across all customer sectors;
- Pursue uniform statewide programs between CL&P and UI;
- Increase the use of third-party planning and delivery of programs;
- Demonstrate measurable success in achieving energy efficiency goals, in term of environmental and economic betterment; and
- Seek linkages to other funds and environmental initiatives.

Benefits

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 dollar savings on electric bills. These energy savings can also reduce emissions of pollutants in the air, enhancing public health and protecting the environment.

Energy savings can also provide economic development benefits for Connecticut’s businesses because C&LM programs often increase the productivity and efficiency of the state’s businesses, which serves to make the Connecticut economy more competitive in local, regional, national and international markets. Finally, C&LM programs specifically designed for special needs groups such as low-income customers, small towns, distressed cities, state buildings, and small businesses, provide social and financial benefits as well as substantial energy savings.

Finally, this plan proposes to expand funding of research, development and demonstration projects that promise to advance the energy efficiency options available to the State of Connecticut. This research program is likely to aid existing companies in the state and generate additional research firms, and its results are aimed at improving both the long-term energy efficiency and the environment of the state.

Strategic Allocation Recommendations and Objectives

Connecticut General Statute 16-245m1d takes a broad view on what activities and initiatives could be addressed with the conservation surcharge funds. UI believes that these resources should be strategically allocated to provide benefits to Connecticut and its citizens.

The Company proposes that C&LM funds be allocated among the following five broad strategic initiatives:

- Market Transformation and Lost Opportunities
- Technical Assistance, Information and Outreach
- Economic and Competitive Market Development
- Special Needs Markets; *i.e.*, low income, state and municipal buildings
- Immediate and substantial reductions in energy use

The remainder of this plan provides details and a rationale for allocating resources to these areas.

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. There is already substantial evidence that UI's C&LM programs, working within the New England Energy Efficiency Partnership and promoting the federally sponsored Energy Star program, has and will continue to cause enduring, positive changes in markets for energy-efficient products and services.

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. Programs aimed at reducing lost opportunities are typically the most cost-effective of the strategic initiatives because the investment in higher efficiency is only incremental to the cost of standard equipment, instead of the total project or system cost.

Strategies to promote market transformation and minimize lost opportunities include the following:

- Providing technical and financial assistance to customers who would not otherwise easily obtain such assistance through existing market channels;
- Promoting permanent changes in customers' purchasing behavior through customer education, training, demonstration of new technologies, and assistance in overcoming transactional barriers;
- Developing relationships with manufacturers; trade allies; business associations; state, regional and national advocacy groups; and government agencies;
- Reducing market barriers to the point where ratepayer funding is no longer needed for many technologies and practices;
- Working to upgrade building code and appliance efficiency standards so that energy efficiency becomes standard practice; and
- Modifying the type and extent of intervention by the Company as market conditions change.

Technical Assistance, Information and Outreach

In an effort to create an “energy efficiency ethic” in Connecticut, UI proposes to institute a broad-based, coordinated advertising and marketing campaign that will raise customer awareness of the value of energy efficiency. Pursuant to directives from the Department, UI will coordinate its efforts for general advertising with CL&P. Within specific C&LM programs, the Company will provide customers with the technical and financial information necessary to make informed decisions on selecting energy efficiency measures, acquiring energy efficient equipment and services, and incorporating energy efficiency as a value-added component of equipment selection, new construction practices, and substantial retrofit activities. UI's current programs incorporate technical assistance, information and outreach; these efforts will be continued and in some instances expanded to be consistent with the increased programmatic expenditures and the market transformation objective.

Strategies to provide technical assistance, information and outreach include the following:

- Providing up-to-date technical and financial information to customers on an ongoing basis so that when they are ready to build, remodel, renovate, or purchase new equipment they factor energy efficiency as a primary criterion into their decision-making process;
- Provide a clear source of communication, including such items as phone line and website;
- Conducting outreach efforts and provide energy-efficiency information to trade allies, retailers, designers, architects, builders, and others to promote the sale and use of energy efficient goods and materials;

- “Cross marketing” all programs, including economic development packages, in order to increase cost-effectiveness and derive the maximum effect from each program; and
- Promoting greater Energy Star brand awareness and knowledge.

Special Needs Markets

While all customer classes, sectors, and geographic areas will receive substantial benefits as a result of UI’s various C&LM programs, some resources will be targeted toward energy-using sectors least likely to be served in a retail competitive market. These sectors include low-income customers, community-based constituencies, and K-12 students. Targeting resources to these sectors not only benefits them directly; it also provides real value to all consumers and 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 healthier, more comfortable home; and greater ability to pay their energy bills. By lowering energy bills for low-income customers, UI – and, therefore, all its customers – saves on the costs of arrearages, bill collection, disconnects, reconnects, lost contribution to utility-company costs, and administrative costs.

Strategies to serve special needs markets include the following:

- Expanding the services which provide outreach, education, coordination, budget planning and energy efficiency services to low-income customers through human services agencies;
- Working with public housing authorities and other developers on low-income new construction and rehabilitation for low-income residents;
- Providing weatherization and energy conservation measures for existing housing stock, and energy education to low-income consumers;
- Evaluating possibilities of efficiency improvements to emergency housing shelters; and
- Enhancing the programs that target state and municipal buildings to provide comprehensive energy efficiency services to those government sectors.

Economic and Competitive Market Development

A major focus of past UI 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 Company’s economic development packages for customers have included C&LM initiatives. These initiatives

educate customers on how to identify and modify existing facilities, systems, and processes to save energy while increasing competitiveness. Financial incentives help make investments in energy saving projects a good business decision.

Pursuant to Department directives, the Company has been working with the ECMB and its consultants to develop third-party C&LM provider initiatives and programs. While, UI's programs already stimulate the energy services industry by utilizing vendors to deliver C&LM programs, the Company continues to increase the opportunities for third-party providers to deliver programs and services.

The Company will also increase its emphasis on incorporating 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, UI enhances the competitive position of Connecticut's business community.

Strategies to promote economic and competitive market development include the following:

- Provide education and technical assistance to identify opportunities that save energy while increasing the economic viability of new, existing, and expanding businesses.
- Provide financial incentives to offset the costs associated with implementing energy efficiency improvements in new, existing, and expanding businesses.
- Foster programs that will utilize the expertise of existing and new third party C&LM providers in the state;
- Foster the development of third party C&LM provider industry through new and innovative initiatives in niche markets, custom projects, ongoing programs, RD&D, and market transformation efforts;
- Increase opportunities to promote new market entrants as third party C&LM providers to serve as integral participants in market transformation efforts and assisting them with opportunities to serve many of the C&LM needs of customers currently being met by distribution companies;
- Promote energy efficiency in all new design and construction projects through marketing, training, seminars, demonstrations, and incentives;
- Establish technical specifications and standards for eligible efficiency measures so that businesses have clear expectations; and
- Promote the concept of integrating efficient energy use into customers' decisions to purchase energy commodities.
- Reduce energy bills, which increase disposable income
- Create jobs resulting from an increased energy efficiency environment

Immediate and Substantial Reductions in Energy Use

As a policy, utilities throughout New England strive to create energy conservation markets that will become self-sustaining and transformed within acceptable timeframes. However, energy markets are not yet transformed, existing structures are aging, and much of the energy-consuming technologies in those structures are inefficient. Changing out functional but inefficient equipment (retrofitting) in addition to market transformation and new construction efforts assures that a balanced approach is obtained.

Energy retrofit programs seek to 1) exchange functioning but inefficient equipment with higher efficiency equipment; 2) improve building shell or facility performance; 3) improve energy use or management practices.

Strategies to achieve immediate and substantial reductions in energy use include the following:

- Provide technical and financial assistance to identify and implement energy efficiency improvements for business and residential customers
- Offer customers flexible CLM programs and participation options that can accommodate individual needs while maximizing savings potential
- Provide appropriate financial incentives to make energy efficiency a "wise investment"
- Develop relationships which support the energy service provider industry to implement new initiatives and realize increased energy savings for customers

Chapter 2
UI C&LM PROGRAMS

Joint Program Comments
Energy Blueprint
Energy Opportunities

Joint Program Comments

In the final decision regarding Docket 99-10-18 the Department stated “Based on the foregoing the Department will require that [the companies] develop identical residential and small commercial and industrial programs in conjunction with [each other] for 2001. In addition, the Department will establish a goal of having CL&P and UI submit a joint conservation filing for the year 2002 programs.” In response to the Department’s requirement, UI and CL&P (the companies) have worked diligently with the ECMB and the Board’s consultants to create identical programs. The results of this cooperative effort is presented to the Department under separate cover in a document titled The Connecticut Light and Power Company & The United Illuminating Company 2001 Joint Program Conservation and Load Management Plan. The Joint Program descriptions are not included in this document. Budgets and benefit/cost details for all programs are included in this document. The following program descriptions include only those that are unique to The United Illuminating Company.

Energy Blueprint

Objective: Energy Blueprint is designed to capture the energy efficiency opportunities at the time of a naturally occurring market event, such as new construction, expansion, renovation, remodeling, and equipment replacement. In addition this program supports market transformation objectives by reducing or eliminating market barriers to energy efficiency in a lasting manner.

Target Market: This program will be targeting commercial, industrial, and institutional customers, as well as small businesses planning new construction projects, major renovations, tenant fit-out, and equipment replacement. This program also targets customer segments with unique needs, such as municipalities, federal and state buildings and new customers to the service territory.

Program Description: UI's Energy Blueprint is a fully integrated program encouraging the design and construction of energy efficient building envelopes, lighting systems, HVAC systems, motors, renovations and tenant fit-outs and other energy components of commercial and industrial buildings. The program provides financial incentives to assist commercial and industrial customers realize long term energy savings, design grants to incorporate energy efficiency technologies prior to construction commencement and technical assistance to create custom energy measures specifically designed to meet a customer's business needs.

The program's other major objectives are to provide the building community with hands-on experience in energy efficiency design and construction and to foster relationships with architectural and construction trade organizations. The program offers one on one customer assistance for design, financing, and energy efficiency analysis. New construction projects tend to take time to complete so this type of program is a multi-year process.

Marketing: UI will tailor its marketing strategy to meet the needs of those individual groups who are looking for one specific energy efficiency opportunity or a wide range of opportunities all at once. Marketing approaches are designed to meet the needs of each unique customer group. With lost opportunity programs, timing can make the difference between a customer designing their facility with all the potential energy efficiency opportunities or none at all. Being there at the time of design, the time of equipment replacement or at the time of renovation is critical to long term

energy savings. Therefore, this program is marketed through a variety of channels that impact how and when energy related decisions are made in this marketplace.

Since this program is such an asset in the early planning stages of construction or renovation, UI must continually create awareness in the target markets that Energy Blueprint exists.

All C & I Customers

UI Energy Engineers, Marketing Representatives, and Account Managers continually solicit customers and their design professionals. Besides face to face contacts, additional marketing efforts include informational mailings, seminars, trade shows, vendor and energy services community programs and UI's Internet web page. UI also coordinates its marketing efforts with federal, state, and regional initiatives. UI personnel interface directly with facilities personnel to assemble implementation teams and determine the appropriate actions during the decision-making process.

Premium Motors Initiative

UI continues its support of this regional efficient motors rebate initiative, jointly marketing to distributors and suppliers via a common implementation vendor. This supply side marketing is crucial to program success. A variety of mediums are employed including mailers, brochures, trade shows, advertising and site visits by trained circuit riders.

Cool Choice Initiative

UI participates in the regional Cool Choice initiative, which works to affect the "upstream" efforts of market transformation. A common regional rebate among all participating utilities strengthens the marketing of this program. The program is also marketed directly to end-use customers through advertising campaigns that consist of direct mail, print, radio, and a variety of other media formats. Relationships with local distributors and contractors promote "downstream" support of the program and adoption of efficient equipment stocking practices.

Design Lights Consortium (DLC)

The DLC is another regional partnership supported by UI. The Consortium is coordinating its effort to influence commercial lighting design toward quality, comfort, and efficiency, during remodeling, renovation, and new constructions activities. To help inform the lighting market, the DLC continues to produce Lighting Design Guidelines (the know-how series) for small industrial markets. DLC targets the electrical contractors, electrical

equipment distributors, and lighting equipment manufacturer and property owners/managers. Marketing efforts include the following activities: training seminars, demonstration projects, and case studies for owners/managers, Internet access for all market players and promotional material for other agencies and organizations.

Incentive Strategy: Energy Blueprint promotes energy efficient construction by paying cash incentives of up to 90% of the incremental costs of the energy efficiency design upgrades. The total incentive package includes: Compliance Incentives for measures meeting the energy efficiency standards of the program, CompliancePlus Incentives for measures that exceed the program's efficiency standards, and Comprehensive Incentives which are bonus incentives to the customer of up to 20% of the compliance incentives for participating on a comprehensive level. In addition, the program offers Design grants and Engineering Grants based on calculated cents per sq. ft formula. Commissioning incentives are available and calculated on an individual basis.

Incentives for the Premium Motors and Cool Choice Initiatives utilize the current NEEP incentive structures.

Budget: See budget chapter 7

Measure of Success: Energy Savings

Energy Opportunities

- Objective:** The objective of the Energy Opportunities program is to capture energy efficiency opportunities by 1) exchanging functioning but inefficient equipment within the commercial or industrial environment with higher efficiency equipment; 2) improving a facility's building shell or facility's performance; 3) improving energy use or management practices; and 4) inducing efficiency where it was not previously present.
- Target Market:** Energy Opportunities targets all commercial, industrial, small business, and institutional customers planning projects to retrofit their facilities with UI approved energy efficiency measures. This program also targets customer segments with unique needs, such as municipalities, federal and state buildings.
- Program Description:** Energy Opportunities offers a comprehensive and highly flexible menu of energy consulting services to existing commercial and industrial customers in order to assist them in retrofitting their facilities with cost effective C&LM measures and technologies. The services provided by Energy Opportunities are varied and specifically designed to meet the needs of the individual customer. They include energy audits, single measure analyses, walk-through audits, energy and end-use analysis, product reviews, review of proposals submitted by contractors or vendors, cash incentives, project financing, and co-funded energy studies for advanced technologies. Additionally, UI will consider a program component targeted at an industrial process, designed to offer technical analysis of pollution prevention, productivity, and energy opportunities, and incentive and financing support to participating firms. The Company will also take advantage of existing organizations, such as ConnSTEP, to support the program.
- Marketing Strategy:** Energy Opportunities is marketed directly to customers through face to face meetings by its Energy Engineers, Marketing Representatives, and Account Managers. UI personnel use tools such as comprehensive information packets, case studies, direct mail, seminars, and trade shows. Its marketing programs are integrated with Federal, State and Regional initiatives. Active participation and involvement with the vendor community influences building trade organizations, vendors, contractors, and energy services companies to become an extension of UI staff by

delivering qualified leads for this program. In addition, UI has program information available on its web-site.

All C&I Customers in General

UI works with all commercial & industrial customers with an average 12-month peak demand of 100 kW or greater. Small customers (less than 100 kW) with specialized needs are also serviced via Energy Opportunities. Program managers work directly with energy service providers to help establish projects, as their efforts are an extension of the UI sales staff. Marketing tools include seminars, trade shows, as well as vendor and energy services community programs.

Sub-programs Delivered Via Energy Opportunities

There are several customer groups with unique characteristics that are served through sub-programs of Energy Opportunities. These include:

- Municipal
- State Buildings
- Economic Development

School Boards of Education

UI plans to contract with a nationally recognized professional educational service to work with teachers, curriculum leaders and key UI personnel to implement a student education program. The students identify potential energy saving retrofit opportunities at their school and present it to their Board of Education. Upon acceptance of the project, the project is managed by the Energy Opportunities program staff. UI offers a 100 % subsidy to the participating schools for the cost of the educational service. The energy efficiency improvements will be supported by the Energy Opportunities initiatives. Direct marketing materials include a comprehensive information packet.

Incentive Strategy: Qualifying Energy Conservation Measures (ECMs) or projects earn incentives up to a maximum of 50% of the total installed cost. The actual dollar amounts vary and are based on the simple payback and kWh savings.

Budget: See budget chapter 7

Measures of success: Energy Savings

Chapter 3 Monitoring and Evaluation

UI monitoring and evaluation (M&E) activities will determine whether or not the 2001 programs are producing the results intended. UI builds on its experience of conservation program M&E in the past and uses the considerable body of M&E knowledge that has been developed and peer-reviewed by professional evaluators over the last decade. By making use of transferable pertinent findings and conclusions drawn by others costs can be kept to reasonable levels while still producing credible results.

UI M&E activities will typically be characterized by having many of the following features:

- A computerized tracking system. Examples of events to be tracked range from individual Energy Conservation measures to large and complex energy systems.
- A baseline or benchmark assessment of current market conditions for the appropriate energy products and services. Some recent baseline studies done by others can be used by UI. In addition, there are some products and services for which UI will perform separate baseline studies.
- Process evaluations will investigate qualitatively how the market views a given program or sub-program.

Impact evaluations are 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. These are used to strengthen the measurement of the true effects of program offerings, with accepted statistical methods.

Each of these has its place and time in the life of a major program or subprogram. UI will work with the ECMB consultants to select the appropriate areas for engaging in studies and analyses to provide the information needed. Those results will then be incorporated into program design and delivery as appropriate.

One special M&E situation arises with regard to the NEEP regional market transformation (MT) activities. UI will collect the necessary information, such as units sold in its service area and its individual sub-program costs, in order to be able to calculate the annual cost/benefit values for its part in the regional effort. The determination of how effectively the regional market is being transformed will be done

through a series of studies to be commissioned by participating utilities, coordinated through the NEEP organization. The results will be used on a regional basis to determine the overall level of success of the initiatives. Thus, while UI will contribute its small share toward the cost of these efforts, it is the jointly funded evaluations that quantify the degree of success.

Industry accepted protocols for the measurement and verification (M&V) of savings resulting from actions taken in a specific building or industrial process will be utilized where applicable. These protocols spell out acceptable approaches to be followed and will form the basis for UI's savings values derived from similar situations found in the UI programs. These protocols give form and consistency to the historically random nature of M&V in the field of performance contracting, guaranteed savings etc. They include the 1997 International Performance Measurement and Verification Protocol (IPMVP), the 1996 Federal Energy Management Program's (FEMP) Measurement Verification Guidelines, and the draft ASHRAE 14-P Measurement of Energy and Demand Savings Guidelines. User groups of these protocols now include in an international setting - government entities, utilities, private companies, and energy service companies.

IMVP covers energy and water conservation and is being used with projects involving emission-reduction credits. It offers a series of options, which can be chosen to meet the needs in a given situation. In a very abbreviated form they include:

- Verification via on-site inspections, spot measurements, commissioning etc.
- Savings determined by measurements taken throughout the term of a contract
- Whole-building or facility level review using the utility meter, billing analysis
- Computer simulation of the process, building or building component operation

CHAPTER 4: 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 benefits greater than program costs.”

UI’s proposed methodology has been developed in recognition of the following general principles:

- There is no single criterion, which adequately reflects all relevant perspectives on the benefits and costs of energy efficiency programs. Therefore, it may be useful to present the results of more than one test in order to fully inform program implementation decisions and to provide the DPUC with the information it requires to advise the Company regarding these decisions.
- The primary focus of the efficiency program is electric end-use efficiency, but non-electric savings that result from the programs constitute legitimate economic benefits that should be included in the benefit/cost analysis. Even though restructured electric distribution companies will no longer be the suppliers of electric generation services, the principle benefits to efficiency program participants will be realized in the form of reductions in the commodity energy and capacity components of “unbundled” electric bills. It is therefore appropriate to include these benefits in the benefit/cost analysis.
- Even though restructured electric distribution companies will no longer be the suppliers of electric generation services, the principle benefits to efficiency program participants will be realized in the form of reductions in the commodity energy and capacity components of “unbundled” electric bills. It is therefore appropriate to include these benefits in the benefit-cost analysis.
- Now that the industry has been restructured, electric distribution companies no longer incur the cost of electric generation. The benefits of efficiency programs should be accounted for in terms of the projected “unbundled” market price of electric generation over the expected life of the efficiency investments.
- While not explicitly included in the present analysis, the long term effects of market transformation must be considered in an overall assessment of program benefits. As noted below, some market transformation initiatives may not appear cost-effective on the basis of a single-year analysis that does not capture such longer-term benefits.

Methodology

Two different tests are used to determine program effectiveness in Connecticut, the Electric System Test and the 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 *Societal Test* includes all identifiable economic costs and benefits of the programs. In addition to the utility 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, and oil and the cost of equipment replacement avoided through the installation of equipment with a longer than standard useful life.

The Societal Test also includes a category of benefits associated with environmental and economic impacts that are not accounted for in the avoided cost of electricity and other resource savings. These other benefits include the value of reductions in air emissions resulting from decreased electric generation and a net increase in jobs resulting from investment in end-use efficiency instead of electric generating capacity.

The components of the two tests are summarized as follows:

	Electric System Test	Societal Test
Costs		
Utility Costs	X	X
Participant Costs		X
Benefits		
Electric Generation Savings	X	X
Electric T&D Savings	X	X
Non-Electric Participant Savings		X
Other Savings		X
Low Income Program Benefits		X

Quantification of Costs and Benefits

Utility Costs

The Utility Costs consist of the direct implementation costs, including program administration, marketing, contractor services, customer incentives and program evaluation costs.

Participant Costs

The Participant Costs consist of the estimated investment in efficiency measures contributed by customers participating in the programs, net of any program incentives.

Electric Generation Savings

The Electric Generation Savings are the expected electric bill reductions associated with “unbundled” generation services. The savings are quantified by multiplying the projected future electric savings in kWh by the Department’s Market Price Forecast. The value of generating capacity was increased to \$6.71/MWh for years 2001 through 2004 to reflect market experience in 2000 as reported by ISO New England.

Electric T&D Savings

A factor of 5.4% has been added to generation savings to reflect the value of transmission and distribution losses. No savings have been attributed to a reduced need for transmission and distribution capacity.

Non-Electric Participant Savings

In some cases measures promoted by the programs produce other savings in addition to savings in the cost of electricity. Efficient washing machines save water and fossil fuels required to heat water for washing clothes. These savings have an economic value to participating customers based on the price of these resources, and are quantified by estimating the future savings of water and fossil fuels, and then multiplying the projected savings by the appropriate market prices.

The 2001 benefit/cost analysis bases non-electric savings on the cost of natural gas in the Energy Star Homes and Appliance programs. An estimate of \$11.50/MMBTU escalating at a rate of 2%/year was used to value the thermal savings in these programs. The value of the thermal savings is reflected in the Societal benefit/cost ratios for these programs, and not in the electric system benefit/cost ratios.

Other Savings

Electricity savings can generate indirect benefits that extend to society as a whole. Reductions in electric generation reduce air emissions from power plants and improve air quality. A generic adder of 15 percent of the value of electric energy savings can be imputed for the benefit of reduced emissions. This adder is based on economic values of emissions reductions developed by the California Board of Energy Efficiency as reported in Appendix A of proposed guidelines on cost-effectiveness filed with the Massachusetts Department of Telecommunications and Energy on April 14, 1999. The 15% environmental benefit adder is applied in the Societal Test to the value of both electric and thermal savings.

Efficiency investments also reduce the total cost of energy services and thereby increase disposable income. This additional income generates increased consumer spending which exerts an economic “multiplier” effect that can result in increased employment. A

generic adder of 10 percent of the value of electric energy savings was imputed for job creation. This adder is applied in the Societal Test to both electric and thermal savings.

Since a large percentage of low income customers live in cities where air quality is often a health concern, and because low income customers spend a relatively large portion of their incomes for electric service, an additional adder of 50% is applied to electric and thermal savings in the Societal Test for UI's low income program.

Interest Rates

A present worth analysis was used to compute the value of savings that accrue during the life of each conservation measure. The discount rate used in the electric system test is 7.55% and is unchanged from last year. The interest rate used in the societal test is 5.78% and is reflective of the 30 year Treasury Bill rate during the fall of 2000. Benefit/cost analysis input and output work papers are included in Appendix C.

Chapter 5 Research, Development and Demonstration

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. The RD&D component of UI's C&LM programs is strategically linked to each of the other program components, which focus on broader-scale initiatives using commercially available technologies and systems. As new technologies become available, they will be incorporated into the other C&LM programs. CL&P and United Illuminating are participating in a common RD&D program. 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, the Company has added an emphasis on distributed resources.

The RD&D program provides an opportunity for UI 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. Public benefits of the RD&D program will 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.

UI currently participates with CL&P in RD&D efforts. UI is a member of the CL&P RD&D Policy Working Group (see CL&P Plan for detailed description). This approach to RD&D allows UI to contribute to increasing the depth and scope of the CL&P program without increasing program overhead and administration costs, or duplicating efforts within the state. This benefits both UI and CL&P customers. UI plans to contribute \$1,000,000 to the CL&P RD&D program in 2001.

In addition to UI's participation in the CL&P RD&D Program mentioned above, UI also plans to continue to be a member of the Consortium for Energy Efficiency (CEE), E-Source, and The Electric Power Research Institute (EPRI) as it was in 2000.

Consortium for Energy Efficiency (CEE) - CEE is a non-profit, public benefit corporation that uses the power of mass markets to advance super energy-efficient technologies that benefit consumers and the environment. This is done by encouraging utilities and other partners across the country to pool their market influence by

voluntarily adopting common programs and efficiency specifications. CEE's national presence has influenced the adoption of energy efficient standards for refrigerators, clothes washers, HVAC equipment, lighting, motors and other appliances. UI will join utilities and other national organizations to support CEE's efforts for continued research and development of efficiency standards for various technologies.

ESource - ESource is an information service company that provides member organizations with independent analysis of retail energy markets, services, and technologies. Currently there are about 400 members including utility companies, other energy service providers, energy users, government agencies, engineering firms, universities, laboratories, research centers, public interest, trade and professional associations, and product manufacturers and suppliers. UI utilizes ESource materials and information to develop and refine CLM program services, and to better understand emerging industry trends.

The Electric Power Research Institute (EPRI) - EPRI is a large research organization with membership open to all that either generate or distribute electric power. EPRI demonstrates new technologies at member facilities to gain public awareness and acceptance of products prior to commercialization. UI plans to selectively fund specific EPRI energy conservation initiatives (Targets) that will advance leading edge energy conservation technologies for customers. UI plans to refocus its EPRI participation in 2001 to fund microturbine performance and durability studies, development of a distributed resource application database, development of a user applications guide for motors and variable speed drives, and development of software for assessment of customer energy savings from energy management systems.

Solar on Connecticut Schools. - The purpose of this program is to demonstrate to students and the public the benefits of renewable energy technology. Since photo-voltaic technology typically has a high capital cost (Small projects have been in the range of \$8-12,000/kW, as compared to \$500/kW for gas fired combined cycle plants), schools typically need corporate contributions to fund these projects. UI supports this activity and will participate in these projects to advance the commercialization of solar initiatives in schools.

Chapter 6 - Performance Indicators and Management Incentive Metrics

Connecticut General Statute 16-245m clearly sets the framework for the state distribution companies to provide energy consumers with access to high quality conservation services. As a regulated electric distribution company, UI has a proven record of experience, accountability, and capability to provide cost-effective conservation services to all segments of retail energy consumers.

Within this framework the Company's role is similar to that of a general contractor, responsible to customers and the Department for ultimate performance of all the services delivered through the plan. As a general contractor, the Company requests that the Department approve its incentive plan. This plan provides the Company with the opportunity to earn a performance incentive on the value of the services delivered under the plan.

A performance incentive is needed because companies and employees respond favorably to clearly defined goals and appropriate incentive opportunities. Financial incentives linked directly to performance create an environment conducive to creativity and teamwork. Effective teamwork leads to higher levels of achievement and produce greater value for all electric consumers. Creating an opportunity to provide direct and measurable benefits to shareowners as well as customers allows employees to be motivated to succeed. In turn, these employees will have the support of the entire organization due to aligned and valued incentives.

In 2000 UI demonstrated its ability to effectively carry out its role as a premier provider of conservation services to our customers. Our record of performance under the current incentive plan is a powerful example of the success achieved when the Department aligns the interests of shareholders and customers properly. Meaningful performance-based financial incentives are a catalyst that can guide a company to achieve superior results.

Recognizing that clear indicators and metrics of performance are helpful in delivering quality programs to Connecticut consumers, the ECMB and the ECMB Consultants have worked extensively with the Company to develop a new performance incentive structure for 2001. The proposed 2001 structure retains the performance index scale and incentive rate schedule that was approved by the Department in 2000. The changes for 2001 include the addition of key Performance Indicators and appropriately weighted Performance Incentive Metrics. This approach allows the Department, ECMB, and the Company to clearly gauge the many components that comprise an effective performance evaluation mechanism for the delivery of CLM programs and services to consumers.

Provided below is the proposed 2001 Performance Indicators and Incentive Metrics table. The weights applied to each of the individual and sector level metrics were developed in collaboration with ECMB consultants. The Utility Performance Incentive is \$1,268,198. This is calculated based on achieving 100% of all performance targets, and earning a Target incentive of 6% of C&LM budgets (not including ECMB costs or management incentive). The actual incentive earned will be determined from the performance achieved in each of the Incentive Metrics identified below based on the following Performance Index:

Performance %	Pretax Incentive
70-74	2%
75-79	3%
80-89	4%
90-99	5%
100-109	6%
110 - 119	7%
120 - above	8%

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
RESIDENTIAL					
All Residential Programs (Sector Level) Sector Budget \$5,728,486	Total electric kWh and kW savings from all residential programs. 16,443,455 annual kWh	Total electric kWh savings from all residential programs.	Annual kWh 16,443,455	.33	\$418,445
		Number of lighting products/sales rebated through all residential programs, with at least 44%	20,500 lighting products/sales, with 44% of	.04	\$50,721

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
	<p>Customer and market awareness and knowledge of Energy Star programs and opportunities</p> <p>Cost-efficiency relative to target cost/kWh saved. \$.351/annual kWh saved</p>	being recessed cans and fixtures, and portable lamps.	sales being recessed cans and fixtures, and portable lamps.		
Community-Based Program (CBP) (Multi-sector but listed in residential) \$401,527	Electric savings (savings included in the performance indicators of other programs) Special focus on savings in the community.	<p>Energy savings included in appropriate sector level metric</p> <p>Bonus of \$.01/annual kWh for all kWh saved in CBP. Available once residential & C&I sector savings metric thresholds are met (70%)</p>	Not able to estimate at this time; simple multiplier of kWh saved		
Residential New Construction \$536,080	<p>Electric savings. 207,532 annual kWh 64 kW</p> <p>Facilitate the quality implementation of and compliance with the code through training support, plan review, and ratings.</p>	<p>Energy savings included in appropriate sector level metric</p> <p>Market share of Energy Star homes completed and/or committed.</p>	12% market share	.02	\$25,360

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
Residential Appliances \$794,244	Electric savings. 2,332,367 annual kWh 946 kW Awareness, attitudes, and behavior of retailers. Customer awareness and knowledge of Energy Star appliances. NEEP regional indicators.	Energy savings included in appropriate sector level metric			
Residential Lighting \$1,527,665	Electric savings. 8,583,607 annual kWh 4,394 kW Customer and market actor awareness and knowledge of Energy Star lighting. NEEP indicators.	Energy savings included in appropriate sector level metric Number of products included in sector lighting metric			
Low Income \$1,519,172	Electric savings. 5,135,000 annual kWh Number of participants and broadened outreach. 225 refrigerator replacements.	Energy savings included in appropriate sector level metric Number of Low Income program participants.	6500 customers served	.02	\$25,360

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
All Other Residential Programs \$949,798	Electric savings. 184,949	Energy savings included in appropriate sector level metric			
COMMERCIAL & INDUSTRIAL (C/I)					
All C/I Programs (Sector Level) Sector Budget \$8,405,671	Total electric kWh and kW savings from all C/I programs. 44,285,625 annual kWh 11,075 kW Cost-efficiency relative to target cost/kWh saved. \$.217/annual kWh saved	Total electric kWh savings from all C/I programs.	Annual kWh saved 44,285,625	0.55	\$697,409
RFP Program \$1,000,680	Electric savings. 4,000,000 annual kWh 991 kW Number and diversity of third parties participating.	Energy savings included in appropriate sector level metric			
Small Business \$1,327,291	Electric savings. 5,761,000 annual kWh 1,750 kW	Energy savings included in appropriate sector level metric Number of small business participants	1224 customers served	.03	\$38,040

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
O&M RFP \$170,341	Electric savings (but no estimate of planned savings – pilot program). Effectiveness of selected proposals and program(s).	No savings metric but include costs in eligible funding for incentive basis.			
Design Lights Consortium (\$ included in RD&D budget)	Demonstration projects NEEP indicators.	Energy savings included in appropriate sector level metric Number of Design Lights demonstration projects.	Fund two Design Lights projects	.01	\$12,680
HVAC/Cool Choice \$76,837	Electric savings, with special focus on savings in the Cool Choice initiative. 85,392 annual kWh 83 kW NEEP indicators.	Energy savings included in appropriate sector level metric Once the annual kWh threshold is achieved a bonus of 1.5 x program kWh savings will be added	85,392 kWh savings		
All Other C/I Programs (C/I New Const, retrofit, RD \$5,830,522	Electric savings. 34,439,233 kWh savings 8,251 kW	Energy savings included in sector level metric			
RD&D					
RD&D Solicitation	Performance criteria developed by RD&D policy working group and/or ECMB.	No savings metric. Include costs in eligible funding for incentive basis			
UI DR Planning	Dedicated and effective	No savings metric. Include			

SECTOR Program	Performance Indicators	Incentive Metrics			
		Incentive Metric	Target Goal	Weight	Incentive
	planning effort.	costs in eligible funding for incentive basis.			

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