

Date: July 6, 1999

To: Chairman Douglas L. Patch
Commissioner Susan S. Geiger
Commissioner Nancy Brockway

From: Jonathan Raab, Facilitator NH Energy Efficiency Working Group

Re: Final Working Group Report

Attached please find the final report of the Energy Efficiency Working Group. It is the product of intensive study and deliberations by the entire Working Group over the last 14 months. This diverse Group of stakeholders worked diligently to respond to the issues raised by the Commission in its Rehearing Order dated March 20, 1998. In doing so, the Group began to take a "fresh look" at energy efficiency issues in light of the evolution of energy efficiency activities in product and service markets and the coming of electric utility restructuring. On every issue, the Group sought solutions appropriate specifically for New Hampshire.

In the end, as you will see in the Report, the Group reached a substantial degree of consensus on many recommendations including a modified cost-effectiveness test, program design objectives, a statewide coordinated low-income program design, the formation of an energy efficiency coordinating committee, and the design of a shareholder incentive mechanism for measures installed on a going-forward basis. On the few issues where consensus was not reached, the Group describes a limited number of options for the Commission's consideration, and describes different stakeholders' perspectives.

On a personal note, I thank the Commission for its patience and willingness to provide the Group with the time it needed to complete this challenging task. I also thank each and every Group member for working so hard and so creatively in crafting these proposals, and allowing me to be part of the process.

I am available to answer any questions the Commission may have after reviewing the Group's Report, as is each and every Group member. On behalf of the Group, I hope that the Report meets the Commission's needs and represents a positive first step forward for future ratepayer-funded energy efficiency activities in New Hampshire.

Report to the New Hampshire
Public Utilities Commission

On Ratepayer-Funded Energy Efficiency
Issues in New Hampshire

Docket No. DR 96-150

From the New Hampshire Energy Efficiency
Working Group

Submitted on July 6, 1999

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	i
1. INTRODUCTION AND OVERVIEW	1
2. BACKGROUND.....	1
3. PARTICIPANTS, MISSION, AND PROCESS	4
4. MARKET BARRIERS, UNDESIRABLE MARKET CONDITIONS, AND MARKETS ELIGIBLE FOR CONTINUED RATEPAYER FUNDING	6
5. PROGRAM DESIGN ISSUES	9
6. PROGRAM ADMINISTRATION.....	10
7. COST-EFFECTIVENESS TESTING.....	14
8. ENERGY EFFICIENCY FUNDING.....	18
9. DISTRIBUTION COMPANY REMUNERATION - SHAREHOLDER INCENTIVES AND LOST- FIXED COST RECOVERY	19
SIGNATURE PAGE	22

TABLES

TABLE 1: COMMISSION QUESTIONS FOR WORKING GROUP.....	2
TABLE 2: ORGANIZATIONS PARTICIPATING IN WORKING GROUP.....	4
TABLE 3: ENERGY EFFICIENCY PRODUCTS AND SERVICES	7
TABLE 4: PROPOSED NEW HAMPSHIRE COST-EFFECTIVENESS TEST.....	15

APPENDICES

APPENDIX 1: NEW HAMPSHIRE ENERGY EFFICIENCY WORKING GROUP GROUNDRULES.....	A3
APPENDIX 2: MARKET FRAMEWORK A.....	A5
APPENDIX 3: MARKET FRAMEWORK B.....	A10
APPENDIX 4: NORTHMARK FOCUS GROUP STUDY FINDINGS.....	A17
APPENDIX 5: PROPOSED LOW INCOME ENERGY EFFICIENCY PROGRAM.....	A34
APPENDIX 5A: REPORT OF THE LOW INCOME SUBCOMMITTEE, 4/20/99.....	A36
APPENDIX 5B: REPORT OF THE LOW INCOME SUBCOMMITTEE, 11/24/99	A41
APPENDIX 5C: REPORT OF THE LOW INCOME SUBCOMMITTEE.....	A52
APPENDIX 6: SHAREHOLDER INCENTIVE COMPONENT GRAPHS & CALCULATION EXAMPLE.....	A67

Executive Summary

In an Order issued on March 20, 1998, the New Hampshire Public Utilities Commission directed interested stakeholders to form a working group on energy efficiency issues.¹ The Commission's Order delineated a set of questions for the group to address.

The New Hampshire Energy Efficiency Working Group (the Group) was constituted in May 1998 with a diverse group of interested parties. In July 1998 the Group agreed on the following mission statement:

We will produce a comprehensive report related to energy efficiency programs and services funded by utility ratepayers that:

- 1) addresses the issues identified by the New Hampshire Public Utilities Commission in its Order No. 22,875 issued March 20, 1998 (pp. 75-86);
- 2) provides recommendations and the framework upon which such recommendations were developed;
- 3) takes a fresh look at utility sponsored programs and other energy efficiency programs and services in New Hampshire including the funding, design and implementation of such programs and services; and
- 4) assists the Commission in resolving the issues under consideration.

As a primary goal, the Group will seek consensus in developing its report and recommendations. Where consensus is not possible, the Group will report the alternate positions and identify the parties subscribing to each position.

In August 1998, the Group selected Dr. Jonathan Raab, Raab Associates, Ltd. to facilitate the Group's process.

The Group discussed and deliberated on the issues raised in the Commission's order for a little over a year. During that time the full Group met approximately 20 times and various subcommittees of the Group also met often. This report to the Commission constitutes the culmination of the Group's efforts to date.

The Group reached agreement on numerous recommendations to the Commission regarding the future of ratepayer-funded energy efficiency in New Hampshire, including the following highlights:

¹ Order No. 22,875 in DR 96-150: Electric Utility Restructuring on Requests for Rehearing, Reconsideration and Clarification.

1. Cost-Effectiveness Testing: The Commission should adopt a New Hampshire cost-effectiveness test that includes the following:
 - A. quantifiable benefits and costs associated with other resources in addition to electricity (e.g., water, gas, oil);
 - B. a 15% adder for additional non-quantified benefits (e.g., environmental);²
 - C. both the benefits and costs associated with market effects (e.g., spillover, post-program participants); and
 - D. the cost of utility shareholder incentives, but applied to all programs together rather than to individual programs.

The Group agrees that all programs including new market transformation initiatives should be screened using this new cost-effectiveness test, and that programs are expected to surpass a 1.0 benefit/cost ratio. Both low-income programs and educational programs could still be approved by the Commission even if they do not surpass a 1.0 benefit/cost ratio given their additional hard-to-quantify benefits. The Group also agreed on numerous other methodological issues and assumptions, but is deferring on a recommendation with respect to the appropriate avoided costs pending some forthcoming research being done in the region that members wish to review.

2. Formation of an Energy Efficiency Committee: The Group agrees that New Hampshire utilities could continue to be the primary program administrators, at least over the next few years (i.e., during the period when transition service is offered). However, the Group recommends the formation of a New Hampshire Energy Efficiency Committee to improve program consistency and reduce program administration and implementation costs through closer cooperation among utilities and other stakeholders. The mission of the Committee would be to develop a core set of consistent programs for New Hampshire ratepayers. The Group recommends broad stakeholder involvement in the Committee and the development of an annual report to the Commission. Recommended membership includes representatives from all of the jurisdictional electric utilities, key state agencies (ECS, DES, OCA), and other stakeholders groups (consumer, environmental, suppliers/energy service companies).
3. Energy Efficiency Budgets: The Group agrees that as is implicit in the restructuring legislation, after 70% of the State has gone to retail competition, each jurisdictional electric utility shall budget 1 mill in the first year and 1.5 mills in the second year for energy efficiency, with the option for an individual utility to exceed that level if the company, other parties, or both so choose and the Commission approves. The Group did not reach agreement on funding rates after the second year, with some members believing that it is premature to do so and others believing that funding rates in the range of 2.5-3.2 mills/kWh are appropriate. The Group also acknowledges and accepts the Commission's recent decision that low-income funding for energy efficiency should come directly from the energy efficiency fund rather than the low-income electric bill assistance portion of the system benefits charge (SBC). However, the Group agrees that once the electric assistance program (EAP) is fully operational, the Commission should review the EAP program to determine if

² The entire Group except for one utility supports this recommendation.

any EAP funds can be made available for low-income energy efficiency programs. The Group has not developed detailed budgets by distribution company, by rate class, or by program type. However, the Group did agree that energy efficiency program funds should be allocated to the residential and commercial and industrial (C/I) sectors in approximate proportion to their contributions to the fund. Additionally, the Group agreed that low-income programs should be funded by all customers. Also, the Group, with the exception of two utilities and Staff, agreed that under- and over-expenditures on energy efficiency programs should be carried into the subsequent year for purposes of calculating energy efficiency budgets.

4. Shareholder Incentives and Lost Fixed Cost Recovery: The Group recommends that utilities be entitled to earn shareholder incentives for post-Implementation Date installations, as defined in this report. The shareholder incentive approach agreed to by the Group is based on the performance of the programs measured in terms of their actual cost-effectiveness and energy savings relative to the projected cost-effectiveness and energy saving savings, respectively. Separate target incentives are proposed for the residential and C/I sectors set at 8% of the total program and evaluation budgets for each sector. Superior performance could be rewarded by up to 12% of the planned sector budgets. The Group, with the exception of two utility members, agreed that there should be no LFCR for measures installed post-Implementation Date. The two utilities who did not agree assert that they should be entitled to LFCR for future programs until ratemaking changes diminish the need for LFCR. The Group agreed that issues associated with historic LFCR should be dealt with on a utility-specific basis by the Commission.
5. Market Framework: The Group spent substantial time trying to forge a framework for determining when particular markets should be eligible for ratepayer funding. The Group wrestled with different perspectives among its members about the definition of a “market barrier” and whether particular market conditions justified consideration for targeted programs. For instance, Group members could not agree whether: 1.) lack of awareness about an energy efficient technology or practice; 2.) lack of availability; or 3.) lack of widespread utilization are indicative of market barriers or market failures; are normal for new products and services, or both. Despite its lack of consensus on definitions and thresholds, the Group worked hard to develop potential tools to use in assessing the eligibility of a given energy efficiency technology or practice for funding. These tools include a detailed framework in matrix form located in Appendix 2A and another narrative framework located in Appendix 2B. Some members prefer one over the other. Nevertheless, the entire Group agreed that these frameworks have many similarities, are not mutually exclusive and are not yet fully fleshed-out. Still, the Group recommends them to the Commission and the proposed Energy Efficiency Committee for potential refinement and use.

In the process of working on the frameworks, the Group analyzed in some detail the use of energy efficient technologies and practices in certain markets. The Group, with the exception of PUC Staff, concluded that there are sufficient undesirable market conditions for low-income customers, residential new construction, and comprehensive lighting design and

emerging new lighting technologies to attempt to design programs in these areas. The Group also sponsored a focus-group study on commercial lighting practices in New Hampshire (see Appendix 4), but has not made recommendations based on that study.

6. Program Design: The Group agreed that proposals for programs in markets eligible for ratepayer funding should identify the reasons for addressing the market, the type of intervention and intervention target, the evaluation and exit strategies, a budget, a program administration proposal, and a cost-effectiveness analysis. The Group also agreed to certain program design principles related to: market transformation, encouraging and not hindering private sector efficiency activities, efficient and effective program administration, and transition and exit strategies. Although the Group did not develop detailed program designs due to limited time and a desire to first have feedback from the Commission on the various recommendations in this Report, the Group did develop and propose a statewide, coordinated low-income program. This program could potentially serve 2,500 low-income ratepayers per year and save approximately 1,000 kWh per participant (see Appendix 5).

1. Introduction and Overview

In March 1998, the New Hampshire Public Utilities Commission directed stakeholders to form an Energy Efficiency Working Group to explore a wide range of issues pertaining to the future of ratepayer-funded energy efficiency activities in New Hampshire. This report is the culmination of that effort. It contains the Group's findings and recommendations on many subjects including: the development of a market framework, program design, cost-effectiveness testing, program administration, financial remuneration for utilities, and funding levels. The report includes a separate section on each of these subjects as well as sections describing the background and the process. In the instances where the Group did not reach a consensus, the Report delineates the differences of opinion. Following the body of the Report are a series of appendices which include the Group's groundrules and supporting information for many of the sections in the Report.

2. Background

The State's interest in energy efficiency is well established in law, as outlined in the RSA's listed in Appendix 3. On March 20, 1998, the New Hampshire Public Utilities Commission issued Order No. 22,875 in DR 96-150: Electric Utility Restructuring on Requests for Rehearing, Reconsideration and Clarification. A section of the Order focused on a range of energy efficiency issues raised by intervenors. In the energy efficiency section, the Commission recommended the formation of a working group for energy efficiency issues:

“We believe that the best way to proceed is to create a working group, as advocated by a number of parties, to help us develop standards for evaluating energy efficiency programs as outlined in more detail below and to assist us in designing an appropriate cost-effectiveness test that we will apply to future programs.” p.83.³

The Commission went on to emphasize that the Energy Efficiency Working Group needed to take a “fresh look” at utility-sponsored energy efficiency programs in light of the following principles laid out in the Commission's order:

- build in obsolescence wherever possible;
- transform markets;
- complement new energy markets, do not hinder their development;
- move as quickly as possible from the payment of lost revenues for DSM programs;
- undertake energy efficiency programs that avoid more costly distribution system alternatives; and
- work within any funding limitations set by the legislature for utilities with rates above the regional average.

³ This Order is available on the PUC's website at www.puc.state.nh.us.

The Commission then posed a number of specific questions for the Working Group to address. These are provided in Table 1 below, along with the relevant sections in this report where each question is addressed.

Table 1: Commission Questions for Working Group

1. What is the appropriate cost-effectiveness test for future program evaluation and whether there should be a different standard to evaluate cost-effectiveness of transformation programs? [*Section 7*]
2. What, if any, market barriers exist, and what are the alternatives to reduce or eliminate these barriers during the transition to market-based programs? We believe the Working Group and others should recognize the effect our public education program may have on reducing informational barriers. [*Section 4*]
3. How the Commission can quantitatively evaluate the effects of these alternatives during the transition? [*Sections 4 & 7*]
4. What market transformation initiatives are needed to stimulate market development of energy efficiency products and services? [*Section 5*]
5. For each market barrier identified, provide a measure(s) that the Commission can use to evaluate the significance of the market barrier as well as how the Commission will know when the barrier is no longer significant. [*Section 4*]
6. What level of funding is appropriate for low-income energy efficiency programs and does sufficient funding exist in the \$13.2 million low-income system benefits charge to use for energy efficiency programs for eligible low-income customers? We remind the Working Group and others that the \$13.2 million low-income fund was intended not only to make bills affordable but also to encourage conservation and energy efficiency to make bills manageable. [*Sections 5 & 8*]
7. What the effects are of utility-sponsored programs on rates and how will the costs of these programs be collected through rates? [*Section 8*]
8. Whether all large commercial and industrial customers should contribute to utility-sponsored DSM programs, even if they do not participate in the programs or receive transition service? [*Section 8*]

Finally, the Commission stated its belief that a working group comprised of a diverse group representing utilities, low-income assistance advocates, energy service providers, conservation and environmental groups, and representatives of affected public agencies such as the Governor's Office of Energy and Community Services (ECS), the NH Department of Environmental Services - Air Resources Division (DES), and the Office of the Consumer Advocate (OCA) would contribute significantly to resolving these issues.

3. Participants, Mission, and Process

In response to the Commission’s directive, the New Hampshire Energy Efficiency Working Group was constituted in May 1998 with a diverse group of interested parties. The list below identifies the organizations which have participated in one or more Group meetings. Participating organizations which have had representatives in attendance for at least half of the meetings are demarcated with an asterisk (*).

Table 2: Organizations Participating in Working Group
Business and Industry Association (BIA)
Campaign for Ratepayer Rights (CRR)
*Conservation Law Foundation (CLF)
*Connecticut Valley Electric Company (CVEC)
*New Hampshire Dept. of Environmental Services-Air Resources Division (DES)
ENRON Corporation (Enron)
*Province I Environmental Network, Episcopal Church (Environmental Network)
*Governor’s Office of Energy & Community Services (ECS)
*Granite State Electric Co. (GSE)
LighTec Inc. (LighTec)
*New Hampshire Legal Assistance (NHLA)
*New Hampshire Electric Cooperative (Coop)
*New Hampshire Public Utilities Commission, Staff (Staff)
New Hampshire State Representative MacGillivray
HNorthern Utilities (Northern)
*Northeast Utilities Services Company (NU)
Office of the Consumer Advocate (OCA)
*Northeast Energy Efficiency Council (NEEC)
*Public Service Company of New Hampshire (PSNH)
*Tri-County Community Action Program (Tri-County)
*Unitil Service Corporation (representing Concord Electric Company and Exeter & Hampton Electric Company) (Unitil)
* = attendance > 50% of Working Group meetings
H = joined Group in 1999

On July 14, 1998, the Group adopted the following Mission Statement:

<u>Mission Statement</u>

We will produce a comprehensive report related to energy efficiency programs and services funded by utility ratepayers that:

- 1) addresses the issues identified by the New Hampshire Public Utilities Commission in its Order No. 22,875 issued March 20, 1998 (pp. 75-86);
- 2) provides recommendations and the framework upon which such recommendations were developed;
- 3) takes a fresh look at utility sponsored programs and other energy efficiency programs and services in New Hampshire including the funding, design and implementation of such programs and services; and
- 4) assists the Commission in resolving the issues under consideration.

As a primary goal, the Working Group will seek consensus in developing its report and recommendations. Where consensus is not possible, the Working Group will report the alternate positions and identify the parties subscribing to each position.

On July 17, 1998, the Group issued a request for proposals to hire a facilitator to help run the Group process and to provide some limited technical assistance. The Group selected Dr. Jonathan Raab, President of Raab Associates, Ltd. as facilitator in August 1998.

Prior to Dr. Raab's commencement of work in September 1998, the full Group met six times, plus additional meetings for three standing committees (low-income, market barriers, and cost-effectiveness). Since September, there have been approximately 20 full-day meetings, plus many additional meetings and conference calls by various subcommittees and task forces established by the Group. In short, this was an extremely intensive process for Group members, with many difficult issues to process and resolve. One of the Group's first tasks with the facilitator was to develop a comprehensive set of groundrules to help govern the Group's interactions with each other, including Group decision making. These consensus groundrules can be found in Appendix 1.

4. Market Barriers, Undesirable Market Conditions, and Markets Eligible for Continued Ratepayer Funding

In its Rehearing Order, the Commission directed the Group to address several questions relating to the existence of market barriers. (The Commission's questions can be found on page 85 of its Rehearing Order and also in Table 1 of this Report.)

The Group pursued these questions within the context of its broader inquiry to determine which markets, if any, warrant ratepayer funding and what types of programs make the most sense in each of those markets. One stumbling block the Group encountered early-on was a lack of consensus among the members and in the literature regarding how to define the relevant market, the definition of a market barrier, whether market barriers exist, and if so, what those market barriers are. Staff asserted that the perceived market barriers often cited in the energy efficiency literature are not market failures, and that according to traditional economic theory only market failures result in an inefficient allocation of resources that may be improved with government intervention. Most other group members disagreed and asserted that market barriers do indeed exist, may be market failures, and may, in certain circumstances, be addressed by ratepayer-funded programs. This disagreement within the Group became apparent in discussions of newer energy efficient technologies and practices. Members could not agree whether lack of awareness about the technology or practice, lack of availability, or lack of widespread utilization are indicative of market barriers or market failures, are normal for new products and services, or both.

Unable to reach consensus on the definition of a "market barrier," the Group decided to explore potentially undesirable market conditions as they apply to energy efficiency markets. Under this approach, the Undesirable Market Conditions Task Force (Task Force) articulated a relatively broad set of market conditions to assess markets. These market conditions are listed under the second column in Appendix 2A. The Group agreed to compile available information on a given market, to identify any gaps in the data, and to fill in information gaps where feasible. When adequate information was available, the Group agreed to address the following questions:

1. Does the information reveal undesirable market conditions?
2. Are the undesirable market conditions changeable?
3. Can ratepayer funding be used to effectively change the undesirable market conditions?

If a particular market is found to have undesirable market conditions and those conditions can be changed effectively using ratepayer-funding and without hindering private sector efficiency activities, the Group agreed to evaluate possible programs for the market that would be subjected to further program design screenings.

The Task Force identified the following non-exhaustive table of energy efficiency products and services to examine in greater detail:

Table 3: Energy Efficiency Products and Services	
<u>Residential</u>	<u>Commercial & Industrial</u>
Lighting – bulbs*	Variable speed drives – replacement
Lighting – fixtures*	Variable speed drives – retrofit
Clothes washers*	Motors – replacement
New construction*	Motors – retrofit
Domestic hot water	Lighting*
Ground source heat pumps	Major renovation
Refrigeration	HVAC – central chiller
Stand-alone freezers	HVAC – unitary (package rooftop)
Air conditioning	Industrial process
Shell measures	Controls
Low Income*	Compressed air
	Refrigeration
	Cooking
	New Construction*

Realizing that time would not permit the thorough examination of every item on the above list, the Group focused on those markets above marked with an asterisk (*) in hope that such an analysis would allow the Group to draw conclusions that could be applied to the remaining markets.

After compiling and analyzing readily available information on the targeted markets, the Task Force reported back to the Group. The Group initially concluded the following:

1. Low-income customers appear to face sufficient “persistent undesirable market conditions” to warrant an exploration of program design targeted at this residential sub-sector. The two key undesirable conditions are lack of access to information and capital.
2. The residential new construction market also seems to face sufficient “persistent undesirable market conditions” that warrant an exploration of program design. These persistent undesirable market conditions include split decision making among multiple actors (e.g., builders vs. owners) and inadequate access to information on the latest energy efficient technologies and practices.
3. For commercial lighting, the Group accepted the Task Force's recommendation to move comprehensive lighting design and emerging new technologies to program design and budget screening. The Group decided that primary research was necessary to examine the extent to which the commercial lighting products and services in New Hampshire have already been transformed and to identify any gaps where on-going ratepayer support may be justified. Using several focus groups, consultants probed to learn what different market actors consider standard practice for lighting in commercial and industrial buildings throughout New

Hampshire, how that may have changed over time, how it may change in the future, and perceived reasons for the changes. The consultant's findings are located in Appendix 4.

Upon further research and consideration, Staff reexamined these conclusions reached by the Group and subsequently concludes the following which differs from the Group: regarding low-income customers, Staff agrees that it is appropriate to make targeted assistance available to low-income customers; however Staff reaches this conclusion for reasons relating to social policy; regarding the residential new construction market, Staff believes that it exhibits behavior typical of normal, healthy competitive markets and that government intervention, if any, should be addressed through the existing Residential Energy Code; regarding commercial lighting, Staff agreed that primary research was necessary to make an initial assessment of the market before deciding whether the Group should move comprehensive lighting design and emerging new technologies to program design and budget screening.

No decisions were initially made for the three other markets (i.e., C/I new construction, residential lighting, and clothes washers) examined by the Group. Although commercial new construction seems to suffer from comparable institutional conditions as residential new construction (e.g., many actors and split incentives), Staff was not comfortable making a recommendation due to the difficulty in compiling information at a comparable level of detail as for the other markets.

For residential lighting, the Group agreed to bifurcate this market into two markets - compact fluorescent lights (CFLs) and efficient fixtures. The Task Force completed tables for both sub-markets using a fairly recent regional baseline study. The numbers indicate that the market for CFLs may be more developed than the fixture market due to greater consumer awareness, greater availability of product, and more experience using the product. However, the Group could not agree on the market implications of the numbers presented, or whether or not to recommend moving this market to program design.

The debate over residential lighting highlighted the need to develop criteria identifying when it would be appropriate to enter and to exit a market. The Group agreed to step back from its market-by-market analysis to see if it could agree on the threshold issue of when a particular market may be eligible for consideration for ratepayer funding.

From these discussions, the Group developed a potential overall market framework located in Appendix 2B. The framework provides one way to segment markets, a set of indicators to look at when assessing whether to enter or exit a particular type of market (e.g., technology or practice), and a list of principles for applying the framework.

Appendices 2A and 2B were both developed during discussions and negotiations of the Group. The Group agrees that neither framework is fully fleshed-out yet. Both are in need of further theoretical and practical refinements. The Group also agrees that there are many similarities between the two (e.g., the researchable questions in Appendix 2B are in many cases virtually identical to the questions in Appendix 2A), and that they are not necessarily mutually exclusive.

The Group's original intent in developing Appendix 2B was to create a simpler framework to complement the matrix in 2A. While some members favor one over the other, the Group as a whole agrees that both merit further consideration. The Group also agrees that the Energy Efficiency Committee (which it proposes later in this report in Section 6) should continue to monitor the market(s) for undesirable market conditions and to track the effectiveness of ratepayer funded programs. The Group further believes that the Committee will need to use some framework. The Committee should look at such issues as consumer awareness, as well as the availability and comparability of energy efficiency products and services compared to less efficient substitutes.

5. Program Design Issues

The Group agrees that a proposal for a program in a market eligible for ratepayer funding should identify:

1. The reasons for addressing this market
2. The general approach or approaches that could best address those conditions
 - A. Type of intervention - education, financing, training, rebates, "pay-as-you-save," etc.
 - B. Intervention target - consumer, retailer, manufacturer, etc.
3. The evaluation metrics and exit strategy
4. Budget
5. Program administration
6. Cost-effectiveness

The Group further agrees that in designing programs, administrators and others should adhere to certain principles including, but not limited to:

1. Maximize opportunities for market transformation such that long-term impacts continue to occur after the program has concluded, thus creating permanent market changes.
2. Assure that ratepayer-funded efficiency programs are designed in a manner such that they complement and do not hinder the development of private sector efficiency products, services, and programs and that they encourage the development of private sector products, services, and programs whenever possible, with the ultimate goal of achieving energy efficiency markets that operate effectively without ratepayer funding;
3. Assure that existing program delivery mechanisms are continued where they provide benefits (e.g., from existing expertise, infrastructure, etc.), do not compete with private sector alternatives, and are cost effective. Consider and recommend to the Commission alternative delivery mechanisms where appropriate; and
4. Assure that there are well-constructed exit or market transitioning strategies for technologies

and practices. Implementation of these transitioning strategies should not wait until reaching exit thresholds, but should begin as you approach them -- i.e., as the market matures. Such strategies may include such things as increasing customer contributions of measure cost, using financing mechanisms over rebates, and retail-focused programs over utility catalogs.

It was not the intent of this Group to develop detailed program designs given the magnitude of its other tasks and the timeframe for reporting to the Commission. Moreover, the Group felt it would not be very productive to move to detailed program design prior to getting feedback from the Commission on the various recommendations included in this report. Nonetheless, the Group provides its basic program design recommendations for a low-income program for New Hampshire with supporting documentation in Appendices 5, 5A, 5B, and 5C. These recommendations are based on substantial work by the Group's Low-Income Subcommittee and numerous discussions with the full Group,⁴ and include:

- A statewide coordinated program.
- Comprehensive energy efficiency products, services, and education that could save 1,000/kWh per year per household on average.
- Funding and infrastructure to ultimately serve approximately 2,500 low-income customers per year.

6. Program Administration

In the course of its deliberations, the Group examined various administrative models including traditional utility administration and other alternatives. The Group examined alternatives either proposed or implemented in California, New York, Vermont and the Pacific Northwest. Under these models, program administration would be provided respectively by: winners of requests for proposals (RFPs),⁵ an existing state agency (NYSERDA); a new statewide entity; and a new regional organization (the Northwest Energy Efficiency Alliance) run by a board comprised of utilities and non-utility stakeholders. The Group also considered the decisions in Massachusetts, Connecticut and Rhode Island for the continuation of traditional utility administration. After careful consideration, the Group agreed that New Hampshire utilities could continue to be the primary program administrators, at least over the next few years (i.e., during the period when transition service is being offered).

⁴ The Energy Efficiency Working Group created a Low Income Subcommittee to study and report to the full Working Group on energy efficiency matters as they pertain to low-income customers. The Low Income Subcommittee was comprised of representatives from the utilities, state agencies, and low-income service providers. The Subcommittee reviewed literature, researched questions assigned to it by the full Group, and produced written reports and presentations for the full Group. The Subcommittee and other interested parties met with the Vermont Energy Investment Corporation ("VEIC") which has designed and implemented low-income energy efficiency programs in other states. The Subcommittee and the full Group also heard presentations by New England Electric System (NEES) and NU on their low-income efficiency programs in other states.

⁵ In California there were to be three RFPs for statewide administrators – one each for residential, commercial/industrial, and new construction programs. Utilities would have been allowed to bid. However, this approach is on hold for several years, as the Governor did not approve funding.

In making this decision, the Group noted that, at least in the short-term, the costs of designing and implementing an entirely new administrative structure probably outweigh the potential benefits, particularly given the uncertainty of long-term ratepayer-funded energy efficiency activities in New Hampshire. Instead, the Group felt that many of the benefits espoused by proponents of alternative administrative structures, such as greater program consistency and reduced costs, could be obtained through closer cooperation among utilities and other stakeholders and greater coordination of program designs, administration, implementation, and evaluations, at least for a core set of programs for New Hampshire ratepayers. As such, the Group agreed to recommend the formation of a New Hampshire Energy Efficiency Committee with the purpose, objectives, membership, governance and duties as described below. However, the Group agreed that this recommendation would be revisited in the future along with the broader issue of continued ratepayer funding for energy efficiency beyond the period when transition service is offered by one or more utilities.

A. Purpose:

The primary purpose of the New Hampshire Energy Efficiency Committee is to assist the New Hampshire Public Utilities Commission in carrying out its statutory authority regarding energy efficiency programs by facilitating collaboration and cooperation in the development of consistent, cost-effective ratepayer-funded energy efficiency programs for New Hampshire, including market transformation activities. The Committee will operate within the policy framework for energy efficiency programs established by the Legislature and the Commission.

B. Objectives:

The primary objective of the Committee is to facilitate collaboration and cooperation among key stakeholders in the development of a consistent set of statewide core programs that:

- are delivered in a manner that provides consumers with access to the programs irrespective of their geographic location within New Hampshire;
- have the same participation criteria, application process, incentives and name in those instances where such “seamlessness” across electric utilities’ service territories is determined important for program success, market transformation objectives, or both; and
- are planned and delivered with the lowest possible administrative costs.

C. Composition:

The Group recommends that the New Hampshire Energy Efficiency Committee be composed of representatives of regulated electric utilities, consumer and environmental advocates, government bodies, and other interested stakeholders. Initially, the Committee should consist of representatives from a broad group of key stakeholders including the following:

- One representative from each of the following utilities:
 - Public Service Company of New Hampshire
 - Granite State Electric
 - Connecticut Valley Electric Company
 - New Hampshire Electric Cooperative
 - Unitil⁶
- One representative from each of the following three State agencies:
 - NH Department of Environmental Services
 - Governor's Office of Energy and Community Services
 - Office of the Consumer Advocate
- Representatives from each of the following stakeholder groups:
 - Consumers' Groups:
 - NH Legal Assistance
 - Other Non-Low Income Residential (to be determined, TBD)
 - Small commercial/industrial representative (TBD)
 - Business and Industry Association of New Hampshire
 - Environmental Groups:⁷
 - Conservation Law Foundation
 - Environmental Network
 - ESCO/Supplier Groups:
 - Power Marketers (TBD)
 - Northeast Energy Efficiency Council
- NHPUC Staff as Ex Officio, Non-Voting Member

The Group also agrees that the Committee should consult with individuals and companies (e.g., ESCOs, customers, gas and water utilities) who may not be voting members of the committee but whose input may be invaluable on specific program design issues.

D. Governance:

The Committee will strive for consensus in its decision making. Where consensus is not possible, a 2/3 vote among all representatives present is required in order for a recommendation to pass. Divided votes will be represented as such in any work products (e.g., reports, recommendations, etc.) and minority reports are an option if any party so desires.

⁶ Unitil - representing both Concord Electric Company and Exeter & Hampton Electric Company

⁷ Staff maintains that there should be only one environmental interest group representative given the presence of DES and ECS.

The Committee will annually elect a Chairperson and a Vice-Chair. The responsibilities of the Chairperson will include, but may not be limited to:

- Chairing Committee meetings;
- Issuance of meeting minutes;
- Coordination of Committee work products (e.g., reports, recommendations);
- Any other responsibilities assigned by the Committee that are consistent with and appropriate to the furtherance of the Group's defined objectives and duties.

Once constituted, the Committee will develop groundrules for operating and making decisions (including adding members, defining a quorum). Group members suggested that the existing Working Group's groundrules (see Appendix 1) could be utilized as the starting text from which the Committee would formulate their own groundrules.

E. Funding:

The Group expects that the Committee will spend money as necessary to carry-out its joint market research, program design, and evaluation studies. The Group agreed that such funds, once approved by the Committee, should come from the SBC funds and be apportioned to the distribution companies. Hiring staff is not anticipated and would require prior Commission approval.

F. Duties:

Within a policy framework established by the Legislature and the Commission, the Committee will help guide the development of statewide energy efficiency programs to be administered by electric distribution companies or other administrators, subject to the Commission's final approval.

Within this framework, the Committee will:

1. Make recommendations for goals and implementation strategies for a core set of system benefits-funded energy efficiency programs for New Hampshire, including:
 - A. recommendations on the most appropriate program administration and delivery mechanisms, after assessing the benefits and cost-effectiveness of various models;
 - B. recommendations regarding proposed administrator implementation plans consistent with the recommended program objectives and strategies, after reviewing and discussing program criteria and structures for core programs in sufficient detail to guide development of full program implementation plans;
2. Coordinate evaluation of program implementation for cost-effectiveness, performance, and consistency with objectives, and recommend modifications as suggested by evaluation results or changed market circumstances;

3. Identify and select contracting and consulting services necessary to carry out the Committee's tasks;
4. Prepare an annual report to the Commission on the progress of the Committee's activities that will include a portfolio of recommended core programs.⁸ Periodically provide reports to various stakeholders; and
5. Any other duties requested or required by the Commission.

The Group also agrees that in the process of meeting the objectives and fulfilling the duties described herein, it may find it necessary or appropriate for the Committee to return to the Commission from time to time for additional clarification or with recommendations.

7. Cost-Effectiveness Testing

Cost-effectiveness tests are a means to evaluate the relative value of ratepayer-funded energy efficiency programs in the context of energy policy goals including, but not limited to, promoting market transformation, lowering energy bills, providing energy savings, capturing lost opportunities, maintaining equity among customer groups, and lessening environmental impacts. Cost-effectiveness testing is not the only consideration in evaluating and prioritizing plans and programs that together form a portfolio of initiatives designed to meet these and other important energy policy goals. (See Appendix 3)

The Group agrees that cost-effectiveness testing results should be reviewed prior to implementing a program to help inform decisions such as setting program priorities and evaluating alternative design strategies. It further agrees that test results should also be reviewed during and after program implementation to assess program progress, refine programs, and calculate utility incentives.

The Group spent time reviewing New Hampshire's current total resource cost (TRC) test, as well as examining tests used or proposed in other states including societal tests, utility tests, electric system tests, participant tests, and ratepayer impact tests. The tests differ in what they include and exclude as both benefits and costs. Often tests using the same name (e.g., electric system test) differ in how they are designed. It is also common for states to use hybrid tests that borrow some elements from one type of test and other elements from another test type (e.g., merging elements from societal and utility or electric system tests). Finally, some jurisdictions look at results from more than one test.

⁸ This report should be filed at least a couple of months before individual utility filings are due so the Commission can review the joint program designs and hold hearings or technical sessions if they deem it useful or necessary. Utility filing dates may need to be changed to better dovetail with the annual report.

In the end, the Group agreed to propose having one test, and that New Hampshire would be well served by making some important modifications to its existing cost-effectiveness test. This modified test compares the total resource costs for an energy efficiency program to the total resource benefits, including quantifiable costs and benefits associated with saving electricity and other resources (e.g., water, gas, or oil), market effects of energy efficiency programs (e.g., spillover and post program participation) and additional non-quantified benefits. The table below shows the components of the cost-effectiveness test recommended by the Group.

Table 4: Proposed New Hampshire Cost-effectiveness Test	
	Proposed New Hampshire Cost-effectiveness Test
Benefits:	
Avoided generation, transmission & distribution costs for:	
A. Program participants	Yes
B. Market effects (e.g., spillover, post-program adoptions)	Yes
Customer Benefits (including O&M)	Yes
Quantifiable avoided resource costs (e.g., water, natural gas)	Yes
Adder for other non-quantified benefits (e.g., environmental and other benefits)	15%
Costs:	
Program costs (e.g., incentives, admin, monitoring, evaluation) for:	
A. Program participants	Yes
B. Market effects (e.g., spillover, post-program adoptions)	Yes
Customer Costs (including O&M)	Yes
Quantifiable additional resource costs (e.g., water, natural gas)	Yes
Utility performance incentives	Yes ⁹

A description of each component of the modified cost-effectiveness test, along with consensus recommendations on methods, follows:

⁹ The target rate of utility performance incentives (e.g. 8% of program and evaluation budgets, see Section 9) will be considered at the program portfolio level but not at the individual program level.

- The Group agreed that standardized regional assumptions for avoided electric generation costs (short and long term) should be used in the calculation of cost-effectiveness, unless and until clearing prices in a maturing competitive retail power market offer more appropriate or representative values. It further agreed to hold off making recommendations on the avoided cost values until reviewing a study currently underway on the subject for Massachusetts utilities as well as conducting other research. The Group agreed that depending on the timing of the study and commencement of the New Hampshire Energy Efficiency Committee, either the Working Group or subsequent Committee would make recommendations to the Commission on this subject.
- For a statewide or regional program, avoided electric T&D costs should be based on a weighted average of such costs of electric utilities in New Hampshire. For a separate, stand-alone program implemented in a given utility service territory, avoided T&D costs should be utility-specific.
- Program participants will include all customers who participate in a ratepayer-funded program and save electricity whether or not the customer receives a financial incentive. Neither benefits nor costs associated with free-riders need to be netted out.¹⁰
- Both the benefits and costs associated with market effects (i.e., spillover and post-program adoptions), where documented, will be estimated and included in cost-effectiveness analyses.¹¹ The Group agrees that this addition to the existing test is particularly important for activities focused on transforming markets.
- Quantifiable resource savings and costs such as water, gas, and oil are typically included in TRC analyses but have not historically been included in New Hampshire. The Group agrees that non-electric resource avoided costs should be included to the extent that they are attributable to a program and can be reasonably quantified based on expected customer savings associated with such resources. Standardized values should be used wherever possible. With this change, for example, water savings from energy-efficient clothes washers would count as a program benefit, while increased gas, oil, or electric consumption for winter heating due to more efficient lighting would count as a program cost.
- The Group, agrees that even with the inclusion of non-electric resource benefits and costs in the proposed New Hampshire Cost-Effectiveness analysis, energy efficiency programs produce environmental and other benefits that are not otherwise captured in the direct avoided costs. The Group, with the exception of Northern, agrees that 15% should be added to avoided energy costs at this time as a proxy for the net benefits from energy efficiency-related savings, and believes that including this adder is consistent with New Hampshire law. (See State Law in Appendix 3)

¹⁰ Although Group members agree that program designs should attempt to minimize free-riders, the Group concluded that the methodological challenges and associated costs of accurately assessing free-riders no longer justifies the effort required to net these out of cost-effectiveness analyses.

¹¹ Market effects may be included as point estimates or in the form of break-even or sensitivity analyses.

While some Group members strongly believe that adequate market-based price proxies currently exist for some of these benefits (e.g., using the price of credits for valuing avoided NO_x and SO₂ emissions), uncertainty about the fuel source of marginal production in a restructured industry renders the application of these proxies difficult until some history has been established in this regard. These members further believe that use of these proxies should be considered once experience is gained with bid-based generation dispatch in the New England Power Pool, and that similar proxies for other benefits (e.g., avoided CO₂ and Mercury emissions) should also be considered as they become available. However, these members agree that, all else being equal, the 15% adder could be adjusted by an appropriate amount, if and when any pollutant-specific proxies are incorporated in the cost-effectiveness test. The Group agrees that as these proxies are developed, care should be taken to recognize that the value of the avoided emissions used to achieve existing regulatory thresholds may already be included in the avoided cost of generation.

- The Group also agrees that the cost to ratepayers for shareholder incentives should be applied at the "portfolio" level, i.e., after assessing the costs and benefits of all programs offered by a utility on an aggregate basis.

Using this revised test, proposed programs that screen with benefit/cost ratios equal to or greater than 1.0 may be approved by the Commission for implementation. Exceptions include low-income programs, where the Group believes that additional benefits unique to low-income programs exist that remain uncaptured even with the 15% adder (see Appendix 5C), and educational programs where the benefits often occur in the future and are difficult to estimate.¹² For both low-income and educational programs, cost-effectiveness analyses should still be run if feasible, and cost-effectiveness remains a concern. But the Group recommends that low-income and educational programs that fall below a benefit to cost ratio of 1.0 may still be approved by the Commission if the programs are otherwise well-designed.

The Group also agreed to the following methodological issues:

- Multi-year analyses should be conducted to judge the relative value of ratepayer-funded energy efficiency programs in the context of energy policy goals including, but not limited to, short and long-term energy savings, removing or reducing undesirable market conditions and transforming markets. Analyses should be conducted assuming programmatic activity over one and three years.
- Projected costs and benefits should be stated in present value terms. The Group agrees to use the Prime Rate adjusted annually (on or around June 1; i.e., 7.75% for the year 2000 programs). Program benefits should be calculated over the useful life of the program's energy efficiency measures. The costs and benefits of market effects should be treated consistently, and the estimates of such effects should be appropriate to the program design

¹² See also Order No. 23, 172, in DR 98-174, PSNH 1999 C&LM Pre-Approval Filing docket, March 25, 1999, pages 6-7.

and time horizon over which it is reasonable to predict such effects. The level of precision of estimates should reflect a reasonable balance between the cost of obtaining various levels of precision, and the importance of long-term market effects to a program's cost effectiveness and design.

- Coordinated evaluation and cost-effectiveness analysis is preferred but not required for programs that are implemented on a coordinated or joint basis or which use the same program designs, procedures and implementation strategies, so as to reduce evaluation costs and increase consistency. Cost-effectiveness analyses for a joint or coordinated utility effort may be joint, individual, or some combination of these options based on the structure and operation of the initiative.

8. Energy Efficiency Funding

The Group reached consensus on the following language with respect to the ratepayer-funded energy efficiency funding rates for the first two years under competition:

“As is implicit in the legislation, after 70% of the market has gone to competition, each jurisdictional utility shall budget 1 mill in the first year and 1.5 mills in the second year for energy efficiency, with the option for an individual utility to exceed that level if the company, other parties, or both so choose and the Commission approves.”

The Group also agreed that after the second year, energy efficiency funding rates should be generally consistent across distribution companies. Some Group members believe it is premature, at this time, to set budgets beyond the second year for a number of reasons (CVEC, Unutil, NHEC, and Staff). Others believe, also for a number of reasons, that beyond the second year, the energy efficiency funding rate should be in the range of 2.5 – 3.2 mills/kWh (ECS, DES, GSE, PSNH,¹³ CLF, Tri-County, Environmental Network, NEEC, and NHLA).

The Commission should consider numerous factors in setting program funding rates including, but by no means limited to, the overall rate reductions achieved in the context of restructuring and the relative level of a utility's rates.

The Group also acknowledges and accepts the Commission's recent decision that low-income funding for energy efficiency should come directly from the energy efficiency fund rather than the low-income electric bill assistance portion of the SBC.¹⁴ However, the Group agrees that

13 PSNH's support for these funding levels is contingent upon final Commission approval of the terms and conditions contained in the Memorandum Of Understanding dated June 14, 1999, by and between the Governor of the State of New Hampshire acting through her Office of Energy and Community Services, the Office of the Attorney General, Staff of the New Hampshire Public Utilities Commission, Public Service of New Hampshire and Northeast Utilities.

14 “There was a question as to whether Demand Side Management (DSM) programs for low-income customers ought to be part of the DSM portion of the system benefit charge or whether it should [be] a part of the low-income

once the electric assistance program ("EAP") is fully operational, the Commission should review the EAP program to determine if any EAP funds can be made available for low-income energy efficiency programs. Such a determination would depend on factors including, but not limited to, attainment of EAP goals, sufficient funding for the arrearage component, and the size of any waiting list. The determination could also be significantly impacted by the Commission's decision with respect to the source of funding for utility start-up costs and on-going utility administrative expenses for EAP.

Other than as described above, the Group has not developed detailed budgets by distribution company, by rate class, or by program type. However, the Group did agree that equity among customer groups is one of the many important factors to consider in the context of energy policy goals. The Group also agreed to stipulate that "as set forth in the statute, all customers should pay the SBC and be eligible for participating in programs." The Group also agreed that energy efficiency program funds should be allocated to the residential and C/I sectors in approximate proportion to their contributions to the fund. However, the Group agreed that low-income programs should be funded by all customers. Furthermore, the Group agreed that ratepayer funds collected for energy efficiency programs should be spent only on energy efficiency related expenses and not for other purposes. Therefore, the Group, with the exception of NHEC, CVEC, and Staff, agree that energy efficiency funding and spending shall be reconciled each year and any over- or under-collections shall be carried forward and added to or subtracted from, as appropriate, the subsequent year's budget.

9. Distribution Company Remuneration - Shareholder Incentives¹⁵ and Lost-Fixed Cost Recovery

In response to the Commission's directive to look at moving as quickly as possible from the payment of lost revenues for energy efficiency programs, the Group examined the entire issue of providing financial remuneration to utilities for implementing energy efficiency programs. The Group found that some utilities in New Hampshire have been remunerated through shareholder incentives (GSE), others through lost fixed cost recovery (PSNH, NHEC),¹⁶ and some through both mechanisms (Unitil, CVEC). Moreover, the Group found that there has existed a range of

portion of the system benefit charge. Chairman Patch moved that the Commission approve the proposal from the LIWG [Low Income Working Group] that the low-income DSM program be included as part of the DSM portion of the system benefit charge, not as a part of the low-income portion. Chairman Patch noted that he believes that the two are distinguishable programs and it would be more appropriate for the DSM related charges, to the extent that there are any, to be considered on a going-forward basis as part of any system benefit charge related DSM programs. Chairman Patch noted that the issue of such DSM-related charges will be addressed at a hearing in the future, after the Commission has reviewed the report from the Energy Efficiency Working Group (EEWG) and a hearing is held on the EEWG recommendations." (Minutes from the Commission Meeting on May 10, 1999)

15 It should be noted that not all distribution utilities are "shareholder" owned; the New Hampshire Electric Coop is "member" owned and has a different financial structure than the investor-owned utilities (IOUs). "Shareholder incentives" should be thought of as "performance incentives" in their case.

16 NHEC received LFCR from 1994 – 1996.

structures, levels, and assumptions in both the incentives and lost fixed cost-recovery (LFCR) mechanisms used by New Hampshire utilities.

The Group also examined the shareholder incentive and LFCR mechanisms either recently adopted or currently under consideration in several other states undergoing utility restructuring. After careful consideration, the Group has agreed that utilities should receive shareholder incentives for measures installed after the Implementation Date.¹⁷ The Group further agrees, with the exception of Unitil, CVEC, and Northern,¹⁸ that measures installed after Implementation Date would not be eligible for LFCR.¹⁹ For measures installed prior to the Implementation Date, the Group agrees that historic LFCR should be dealt with on a utility-specific basis by the Commission. The details of the Group's proposed shareholder incentive mechanisms are set forth below.

Shareholder Incentives:

The Group recommends that distribution utilities administering energy efficiency programs in a cost-effective manner receive a performance incentive for these activities. The purpose of the incentive is to motivate the utilities to aggressively pursue achievement of the performance goals of their energy efficiency programs. Shareholder performance incentives for a given utility shall be established annually in the following manner:

Design of the Shareholder Incentive:

- 1) The proposed shareholder incentive is a sliding scale incentive with two components. The first, *the cost-effectiveness component*, is based on the relationship between the projected New Hampshire Cost-Effectiveness test (NHCE) and the actual year-end NHCE. The second, *the energy savings component*, is based on the relationship between the projected lifetime kWh savings from installed measures (planned savings) and the lifetime kWh savings from actual installations (installed savings).
- 2) There will be two separately calculated incentives – one for the combined programs in the *residential sector* and one for the combined programs in the *commercial/industrial (C/I) sector*.
- 3) Target or Design Performance

17 Implementation Date is the date a distribution utility implements its new energy efficiency plan approved by the Commission, after the Commission reviews and rules on the Group's Report and recommendations.

18 CVEC, Unitil, and Northern assert that they should receive LFCR for future programs until ratemaking changes diminish the need for LFCR by decoupling mechanisms and/or other appropriate mechanisms to assure an opportunity to earn a return that is not diminished by revenue erosion from energy efficiency programs.

19 PSNH asserts that if the terms and conditions set forth in the June 14, 1999 Memorandum of Understanding (MOU) receive final approval by the Commission, it will not seek any further recovery of LFCR and will support the proposal for shareholder incentives. In the event that the terms and conditions set forth in the MOU are not approved, PSNH asserts that it may seek recovery of LFCR in accordance with its current methodology.

- a) In each sector, a utility that achieves an actual NHCE equal to the projected NHCE and installed savings equal to the planned savings earns a before tax incentive of 8.0% of its planned energy efficiency program budget for that sector.
- b) The proposed shareholder incentive will be calculated as follows:
 - i) Residential Sector Incentive = $[\text{actual NHCE} \div \text{projected NHCE}] * [4\% * \text{residential planned energy efficiency budget}]$, plus $[\text{installed savings} \div \text{planned savings}] * [4\% * \text{residential planned energy efficiency budget}]$
 - ii) C/I Sector Incentive = $[\text{actual NHCE} \div \text{projected NHCE}] * [4\% * \text{C/I planned energy efficiency budget}]$ plus $[\text{installed savings} \div \text{planned savings}] * [4\% * \text{C/I planned energy efficiency budget}]$
- c) A utility will not earn anything on the cost-effectiveness component of its incentive in a sector if the actual NHCE for the combined programs in that sector is less than 1.0
- d) A utility will not earn anything on the energy savings component of its incentive in a sector if the actual energy savings for the combined programs in that sector is less than 65% of its planned energy savings.
- e) A utility's incentive in a given sector will be capped at 12% (before tax) of its planned energy efficiency budget. There is no cap on either component of the incentive as long as the combined incentive for any sector does not exceed 12% of that sector's planned budget.
- f) "For incentive calculation purposes only, planned energy efficiency budget" is defined as the total program budget minus shareholder incentives and lost fixed cost recovery, if any.
- g) The avoided costs used in calculating the actual NHCE shall be those used to calculate the Commission-approved projected NHCE.
- h) This incentive mechanism shall remain in place through the end of the transition service period of the last utility to introduce retail choice. At that time, the incentive structure will be revisited, along with the over-riding review of energy efficiency programs.
- i) The percentage incentive rates provided for in this proposal may be adjusted in the event of an extended period of either significant inflation or deflation following the effective date of this proposal.
- j) Any variance in spending for any individual program of 20% under or over budget shall require Commission approval.
- k) Final annual shareholder incentives will be determined retrospectively.²⁰

An example of the Shareholder Incentive calculation and graphs are provided in Appendix 6.

²⁰ A number of the accounting issues related to shareholder incentives still need to be fleshed-out, for example, whether incentives should be budgeted for the program year or the year in which they are ultimately determined, and treatment of incentives from years prior to Implementation Date.

Signature Page

We the undersigned have participated in the New Hampshire Energy Efficiency Working Group process and endorse the findings and recommendations contained in this report:

David Marshall for
Conservation Law Foundation

Bruce Bentley for
Connecticut Valley Electric Company

Kenneth A. Colburn for
New Hampshire Dept. of Environmental
Services – Air Resources Division
Represented by
Katherine Hartnett and
Andrew M. Bodnarik

Jane Doherty for
Province I Environmental Network,
Episcopal Church

Heidi Kroll for
Governor's Office of Energy & Community
Services

Elizabeth Hicks (New England Power
Service Company) for
Granite State Electric Co.

Alan Linder for
New Hampshire Legal Assistance

Bill Gabler for
New Hampshire Electric Cooperative

Tom Frantz for the Staff of the
New Hampshire Public Utilities
Commission, Staff

Michael W. Townsley for
Northeast Utilities Service Company

John Manning for
Northeast Energy Efficiency Council

Paul Smith for
Northern Utilities

Gil Gelineau for
Public Service Company of New Hampshire

Lawrence Kelly for
Tri-County Community Action Program

Frederick Stewart, Unitil Service Corp. for
Concord Electric Company and Exeter &
Hampton Electric Company

Additional Signature Page

We the undersigned have participated in the New Hampshire Energy Efficiency Working Group process and endorse the findings and recommendations contained in this report:

Dennis A. Hebert for
Campaign for Ratepayer Rights

Appendices to the
Report to the New Hampshire PUC
On Ratepayer-Funded Energy Efficiency Issues in New Hampshire
From the New Hampshire Energy Efficiency Working Group
July 6, 1999

Appendix – Table of Contents

APPENDIX 1: NEW HAMPSHIRE ENERGY EFFICIENCY WORKING GROUP GROUNDRULES	A3
APPENDIX 2A: MARKET FRAMEWORK A.....	A5
APPENDIX 2B: MARKET FRAMEWORK B.....	A10
APPENDIX 3: NEW HAMPSHIRE REVISED STATUTES ANNOTATED (RSA).....	A15
APPENDIX 4: NORTHMARK FOCUS GROUP STUDY FINDINGS.....	A17
APPENDIX 5: PROPOSED LOW INCOME ENERGY EFFICIENCY PROGRAM	A34
APPENDIX 5A: REPORT OF THE LOW INCOME SUBCOMMITTEE, 4/20/99.....	A36
APPENDIX 5B: REPORT OF THE LOW INCOME SUBCOMMITTEE, JANUARY, 1999	A41
APPENDIX 5C: REPORT OF THE LOW INCOME SUBCOMMITTEE, 11/24/98.....	A52
APPENDIX 6: SHAREHOLDER INCENTIVE COMPONENT GRAPH & CALCULATION EXAMPLE..	A67

APPENDIX 1: New Hampshire Energy Efficiency Working Group Groundrules

[As revised and adopted on 10/14/98]

1. The Working Group will be open to new members until December 15th, and only by consensus¹ of the Group thereafter.
2. New members can only join the Working Group if they are willing to accept and abide by all the Group's groundrules and prior decisions.
3. Each member organization of the Working Group will designate a lead representative, and, at their discretion, an alternate or alternates.
4. Only the lead representative, or the alternate in the case of the representative's absence, will participate in formal decisionmaking.
5. The Working Group meetings are public meetings open to anyone interested in attending.
6. Meeting attendees from Working Group member organizations can participate in all discussions and deliberations. Other members of the public who are not from Working Group member organizations will also be given a chance to express their opinions and make suggestions at appropriate junctures, as determined by the Working Group and the facilitator.
7. Working Group members will make every attempt to attend the Working Group meetings and to be on-time. Members who can not make a meeting should let the facilitator know (by voice or e-mail until the night before the meeting, and by voice mail the morning of the meeting).²
8. Decisions will be made by consensus, where consensus shall mean that everyone is at least "willing to live with a decision".
9. If unable to consent, a representative will be expected to explain why and to try and offer a positive alternative.
10. Representatives are responsible for voicing their objections and concerns, and silence will be considered consent.
11. Parties absent from a particular Working Group meeting are assumed to consent to decisions made at that meeting (as described in the minutes) unless and until they register a dissent with the facilitator but no later than four days prior to the next meeting (e.g., the notification cut-off for a Tuesday meeting is the previous Friday at noon).³

¹ "Consensus" is defined in groundrule #8.

² This notification is not necessary if an alternate from the same organization plans to be in attendance.

³ This notification date assumes the Group continues to meet every other week, and that the minutes are circulated

12. The facilitator will flag when major decisions are expected to be made by the Group at the next meeting in the minutes, agenda, or both when known.
13. The Group's final product will include a description of all areas of consensus, and a description of the alternative approaches preferred by Group members in areas where consensus was not reached. For non-consensus items, if any, the final product will identify the parties subscribing to each of the alternatives described.
14. Working Group participants will be expected to participate in "good faith negotiations" including being truthful, communicative, and avoiding personal attacks.
15. Working Group participants will keep their organizations up to speed on developments in the Working Group process.
16. Neither the Working Group participants nor the facilitator will speak on behalf of the Working Group or its members without the Working Group's permission.
17. The facilitator will treat confidential discussions with parties confidentially.
18. The Working Group can change, add, or subtract groundrules at any time during the process by consent of the Group

within a week of each meeting.

APPENDIX 2A: Market Framework A

MARKET CHARACTERISTICS	MARKET CONDITIONS	TEST QUESTIONS	WHAT INFO IS NEEDED TO ANSWER TEST QUESTIONS	SOURCE(S) OF DATA/ INFO	ACTUAL RESEARCH RESULTS	DO WE NEED FURTHER RESEARCH?	FINAL RESEARCH RESULTS	DOES INFO REVEAL UNDESIRABLE CONDITION?	IS UNDESIRABLE CONDITION CHANGEABLE?	CAN RATEPAYER FUNDING BE USED EFFECTIVELY?	WHAT IS THE PROGRAM DESIGN?	WHAT IS THE EXIT STRATEGY?	WHAT WILL BE MONITORED AND EVALUATED?
INFORMATION	General Consumer Awareness of Product	Are consumers generally aware of product?	Consumer awareness										
	Key Feature Info Available to Consumers	Is info of comparable quality and quantity as readily available as it is for standard practice? (Search costs)	Dealer availability Stock in stores										
		Are consumers risk averse to this technology?	Info on customer reaction										
	General Supplier Awareness of Product	Are suppliers generally aware of product?	Info on dealers										
	Key Feature Info Available to Suppliers	Is info as readily available as it is for standard practice?	Info on dealers										

MARKET CHARACTERISTICS	MARKET CONDITIONS	TEST QUESTIONS	WHAT INFO IS NEEDED TO ANSWER TEST QUESTIONS	SOURCE(S) OF DATA/ INFO	ACTUAL RESEARCH RESULTS	DO WE NEED FURTHER RESEARCH?	FINAL RESEARCH RESULTS	DOES INFO REVEAL UNDESIRABLE CONDITION?	IS UNDESIRABLE CONDITION CHANGEABLE?	CAN RATEPAYER FUNDING BE USED EFFECTIVELY?	WHAT IS THE PROGRAM DESIGN?	WHAT IS THE EXIT STRATEGY?	WHAT WILL BE MONITORED AND EVALUATED?
PRODUCT HOMOGENEITY	Availability of Substitutes	What are the standard practice substitutes?											
		Are EE substitutes available?	Info on EE models										
PRODUCT HOMOGENEITY, continued	Degree of Substitutability	How does Price compare (equivalent life)	Price Info										
		How does quality compare?	Quality info										
BARRIERS TO ENTRY/EXIT	Access to Distribution	What are the channels of distribution?	Info on distribution channels										
		Are the channels of distribution different for EE products than for standard products?	Info on distribution channels										
		What is the level of market penetration?	Market penetration data										

MARKET CHARACTERISTICS	MARKET CONDITIONS	TEST QUESTIONS	WHAT INFO IS NEEDED TO ANSWER TEST QUESTIONS	SOURCE(S) OF DATA/ INFO	ACTUAL RESEARCH RESULTS	DO WE NEED FURTHER RESEARCH?	FINAL RESEARCH RESULTS	DOES INFO REVEAL UNDESIRABLE CONDITION?	IS UNDESIRABLE CONDITION CHANGEABLE?	CAN RATEPAYER FUNDING BE USED EFFECTIVELY?	WHAT IS THE PROGRAM DESIGN?	WHAT IS THE EXIT STRATEGY?	WHAT WILL BE MONITORED AND EVALUATED?
BARRIERS TO ENTRY/EXIT, continued	Access to Distribution, continued	How mature is the EE offering? (Life-cycle)	Info on maturity										
	Economies of Scale	Are there economies of scale?											
	Economies of Scope	Are there economies of scope?											
	Large Sunk Cost		Cost info										
	Government Intervention	What government programs exist?	Program info										
MANY BUYERS	Number of buyers	Is the number of buyers sufficiently large such that no single buyer can affect price?	Info on # of buyers										
	Independence of buyers	Do buyers act independently?											

MARKET CHARACTERISTICS	MARKET CONDITIONS	TEST QUESTIONS	WHAT INFO IS NEEDED TO ANSWER TEST QUESTIONS	SOURCE(S) OF DATA/ INFO	ACTUAL RESEARCH RESULTS	DO WE NEED FURTHER RESEARCH?	FINAL RESEARCH RESULTS	DOES INFO REVEAL UNDESIRABLE CONDITION?	IS UNDESIRABLE CONDITION CHANGEABLE?	CAN RATEPAYER FUNDING BE USED EFFECTIVELY?	WHAT IS THE PROGRAM DESIGN?	WHAT IS THE EXIT STRATEGY?	WHAT WILL BE MONITORED AND EVALUATED?
MANY SELLERS	Number sellers	Is the number of sellers sufficiently large such that no single seller can affect price?	Info on manufacturers distribution										
	Independence of Sellers	Do sellers act independently?											
OTHER	Other Market Actors	⇒ Need section on distribution											
	Consumer access to capital	What access to capital do consumers of industry standard products have?	Info on buying patterns										
		What access to capital do consumers of EE products have?	Info on buying patterns										
	Bounded rationality	What decision rules do consumers apply when purchasing products?											

MARKET CHARACTERISTICS	MARKET CONDITIONS	TEST QUESTIONS	WHAT INFO IS NEEDED TO ANSWER TEST QUESTIONS	SOURCE(S) OF DATA/ INFO	ACTUAL RESEARCH RESULTS	DO WE NEED FURTHER RESEARCH?	FINAL RESEARCH RESULTS	DOES INFO REVEAL UNDESIRABLE CONDITION?	IS UNDESIRABLE CONDITION CHANGEABLE?	CAN RATEPAYER FUNDING BE USED EFFECTIVELY?	WHAT IS THE PROGRAM DESIGN?	WHAT IS THE EXIT STRATEGY?	WHAT WILL BE MONITORED AND EVALUATED?
OTHER, continued	Split Incentives	Do lease policies internalize the energy costs of different owner-occupied arrangements?	Landlord tenant info										
	Externalities in product pricing or electricity pricing												

APPENDIX 2B: Market Framework B

I. Market Segmentation

Markets can usefully be segmented into the following three categories for examining energy efficiency opportunities and undesirable market conditions:

1. Customer Type/Class

This type of market is specifically focused on types of customers. For Customer Type/Class markets, programs would be considered where persistent institutional market barriers exist. The Group (with the exception of Staff; see Report Section 4 - *Market Barriers, Undesirable Market Conditions, and Markets Eligible for Continued Ratepayer Funding*) agreed that low-income customers fit this category, and that persistent barriers are also likely for rental housing, leased commercial space, and small commercial/industrial customers. The programs for addressing these types of markets, would probably consist of multiple technologies and practices because they would all generally face comparable institutional barriers related to the customers rather than the technologies or practices themselves.

2. Decision Nodes/Types

This type of market is characterized by the timing of a decision. For Decision Nodes/Types, again programs would be considered where persistent institutional market barriers exist. The Group (with the exception of Staff; see Report Section 4 - *Market Barriers, Undesirable Market Conditions, and Markets Eligible for Continued Ratepayer Funding*) identified new residential construction as such a market, and agrees that it is likely that new commercial construction and possibly other markets such as equipment purchased at the time of failure face comparable systemic problems. Again, the programs for addressing these types of markets could consist of multiple technologies and practices because they would all generally face comparable institutional barriers related to the decisionmaking timing and framework rather than the technologies or practices themselves.

3. Technologies and Practices

This type of market is characterized by specific energy efficient technologies (e.g., efficient clotheswashers) and practices (e.g., commissioning⁴). For Technologies and Practices, the Group discussed developing a set of principles to define when relatively new, cost-effective energy-saving technologies and practices should be considered eligible for program focus and when such support should be ended or phased-out. The notion here is that there is a role for ratepayer-funding to help "jump-start" and support promising energy efficient technologies and practices.

⁴ Commissioning is the practice of ensuring that new equipment installed in buildings is operating properly and therefore, operating at its optimal efficiency.

II. Designing Initiation and Phase-Out Strategies for Energy Efficient Technologies and Practices

What follows is an overall framework for deciding specifically when technologies and practices would be eligible for program design and funding consideration.⁵ The overall premise is that new or very underutilized energy efficient technologies or practices that appear to be cost-effective would be eligible for program design and funding consideration without definitive proof that the underutilization of the technology or practice was due to persistent market barriers or undesirable market conditions. However, technologies and practices would lose ratepayer-funded programmatic support when certain thresholds tied to important market indicators are surpassed. The exiting would take place even if all cost-effective savings had not been achieved and some market barriers or undesirable market conditions remained, as long as the market for that technology or practice had been reasonably transformed.

The following three indicators should be the central indicators to track progress in technology/practice markets and for use in designing exit or transitioning strategies:

Consumer Awareness: Consumers need to be tested for their level of knowledge (education) on costs and benefits of the technology or practice relative to standard practice (not just whether they have heard about it). For example, they should have some idea of the relative life-cycle cost, not just the first cost. They should also understand quality and performance issues. Finally, they should know where to get the product or service.

Stocked/Specified: These indicators should be tied to the availability of energy efficient products and services compared to standard practice, such as where products and services are available and both the quantity and quality of that availability.⁶

Installed/Used: For installed/used there should be two distinct types of indicators. The first is the market penetration of cost-effective products or services in a given year. For example, the percentage of new refrigerators purchased in a given year that was Energy Star labeled. The second is the overall or cumulative saturation.⁷

The following tables contain candidate questions that could be used to track progress with respect to the three indicators:

⁵ Technologies and practices would still need to be cost-effective, and pass through other program design screens such as whether ratepayer funding can be used effectively.

⁶ Issues for Further Discussion: Should availability be tied just to the ability to get it "from somewhere if you want it" or that it is "available where you normally buy the technology or turn for advice"? Should "specified" include the percentage of specifiers who specify, the frequency of specification, or both?

⁷ Issue for Further Discussion: Should saturation targets be set based on customers or products?

AWARENESS

Residential

- 1) Are consumers generally aware of the product?
- 2) Are consumers aware of the energy savings associated with the product?
- 3) Are consumers knowledgeable about where to purchase the product?
- 4) Are consumers knowledgeable about the price differential between the energy efficient alternatives and standard practice?
- 5) Are consumers willing to consider paying the price differential for the energy efficient alternative?
- 6) Do consumers view the energy efficient alternative as comparable or better to standard practice?

Commercial/Industrial

- 1) Who is the decision-maker within the firm for this type of purchase?
- 2) Is the decision-maker aware of the energy efficient alternative?
- 3) Is the decision-maker aware of the energy savings associated with the product?
- 4) Is the decision-maker knowledgeable about where to purchase the energy efficient alternative?
- 5) Is the decision-maker aware of the price differential?
- 6) Does the decision-maker consider the energy efficient alternative to be as reliable and tested as standard practice?
- 7) Is the decision-maker willing to pay the price differential?
- 8) Are the decision-maker's installers familiar with the energy efficient product?

AVAILABILITY

Residential

- 1) Where is the energy efficient alternative product sold?
- 2) Is the energy efficient product sold in the majority of places that the standard practice product is sold?
- 3) Are consumers knowledgeable about where to purchase the energy efficient alternative?
- 4) How much floorspace/shelf space (in percent) is devoted to the energy efficient alternative?
- 5) Are retailers able to purchase the energy efficient alternative from their suppliers?
- 6) Which is more profitable to the retailer - standard practice or the energy efficient alternative?
- 7) What are the lead times for the standard practice vs. the energy efficient alternative?

Commercial/Industrial

- 1) Is the energy efficient alternative available from regular distribution channels?
- 2) Does the decision-makers delivery standard supplier stock the energy efficient alternative?
- 3) What are lead times for the standard practice product vs. energy efficient alternatives?
- 4) Is the decision-maker knowledgeable about where to purchase the energy efficient alternatives?
- 5) What percentage of inventory is devoted to the energy efficient alternative?
- 6) What is more profitable to the distributor - standard practice or the energy efficient alternative?

IN USE/IN SERVICE

Residential

- 1) What is the regional market penetration in a given year of the energy efficient alternatives?
Market Penetration = # units energy efficient alternatives in a year ÷ all sales of the product category in a year
- 2) What is the regional market saturation of the energy efficient alternatives?
Market Saturation = # units energy efficient alternatives in use in total ÷ # units of the product category in use
- 3) What are recent regional sales trends of the product?
- 4) What are recent regional sales trends of the energy efficient alternatives?
- 5) What is the average lifetime of the product?

IN USE/IN SERVICE

Commercial/Industrial

- 1) What is the regional market penetration of the energy efficient alternatives?
Market Penetration = # units energy efficient alternatives in a year ÷ all sales of the product category in a year
- 2) What is the regional market saturation of the energy efficient alternatives?
Market Saturation = # units energy efficient alternatives in use in total ÷ # units of the product category in use
- 3) What are recent regional sales trends of the product category?
- 4) What are the recent regional sales trends of the energy efficient alternatives?
- 5) What is considered standard practice?
- 6) What is the average lifetime of the product?

III. Principles for Applying the Three Indicators

Most of the Group agreed that the following set of principles should be used for applying the three indicators⁸:

1. Each program should have a "plan" that includes such items as goals, projections, program-specific thresholds⁹ related to the three indicators, and strategies for reaching all of these and then ramping down the program.
2. Progress towards meeting the thresholds for the three indicators should be reviewed on a periodic basis appropriate to the program. If reasonable progress toward reaching the thresholds for the three indicators is not being made, then the program should be carefully examined and, if necessary or appropriate, refined, redesigned or phased-out.
3. As long as reasonable progress toward reaching the thresholds for the three indicators is being made, the program should be kept in place unless there are substantial reasons to do otherwise. The program should be carefully examined to ensure the progress is sustainable and likely to be lasting. As the thresholds for the three indicators are approached, the program should incorporate transition strategies, as appropriate.
4. If the thresholds for all three indicators are met, then the program should be ramped down and phased out unless there are substantial reasons (e.g., related to the framework's other two prongs: decision nodes and customer types) to do otherwise.
5. If only one or two of the thresholds for the three indicators are met, then the program should be carefully examined and, if necessary or appropriate, refined, redesigned, or phased-out.
6. If a new building code or appliance efficiency standard requirement goes into effect, or is about to go into effect, for technologies or practices covered in one or more programs, then those programs should be carefully examined and, if necessary or appropriate, refined,

⁸ Staff put forward its own set of principles. PSNH, Granite State Electric, CLF and NU believe that the framework is still being fleshed-out and it is therefore premature to finalize principles.

⁹ Several members of the Working Group have expressed some concern about using overly-simplified quantified thresholds, in large part due to the difficulty of accurately measuring progress toward the thresholds.

redesigned, or phased-out.

Staff supports the following set of principles:

1. Each program recommendation should include goals, projections, and strategies.
2. Market conditions should be reviewed on a periodic basis and, if necessary or appropriate, the program should be refined, redesigned or phased out.
3. If a new building code or appliance efficiency standard requirement goes into effect, or is about to go into effect, for products covered in one or more programs, then those programs should be carefully examined and, if necessary or appropriate, refined, redesigned, or phased out.

APPENDIX 3: New Hampshire Revised Statutes Annotated (RSA)

TITLE 34 Public Utilities

- **§ 374-F:1 Purpose.** – I. The most compelling reason to restructure the New Hampshire electric utility industry is to reduce costs for all consumers of electricity by harnessing the power of competitive markets. The overall public policy goal of restructuring is to develop a more efficient industry structure and regulatory framework that results in a more productive economy by reducing costs to consumers while maintaining safe and reliable electric service with minimum adverse impacts on the environment. Increased customer choice and the development of competitive markets for wholesale and retail electricity services are key elements in a restructured industry that will require unbundling of prices and services and at least functional separation of centralized generation services from transmission and distribution services.
- **§ 374-F:3 VIII Environmental Improvement.** Continued environmental protection and long term environmental sustainability should be encouraged. Increased competition in the electric industry should be implemented in a manner that supports and furthers the goals of environmental improvement. Over time, there should be more equitable treatment of old and new generation sources with regard to air pollution controls and costs. New Hampshire should encourage equitable and appropriate environmental regulation, based on comparable criteria, for all electricity generators, in and out of state, to reduce air pollution transported across state lines and to promote full, free, and fair competition. As generation becomes deregulated, innovative market-driven approaches are preferred to regulatory controls to reduce adverse environmental impacts. Such market approaches may include valuing the costs of pollution and using pollution offset credits.
- **§ 374-F:3 X Energy Efficiency.** Restructuring should be designed to reduce market barriers to investments in energy efficiency and provide incentives for appropriate demand-side management and not reduce cost-effective customer conservation. Utility sponsored energy efficiency programs should target cost-effective opportunities that may otherwise be lost due to market barriers.
- **§ 378:37 NH Energy Policy.** The general court declares that it shall be the energy policy of this state to meet the energy needs of the citizens and businesses of the state at the lowest reasonable cost while providing for the reliability and diversity of energy sources; the protection of the safety and health of the citizens, the physical environment of the state, and the future supplies of nonrenewable resources; and consideration of the financial stability of the state's utilities.

- **§ 378:38 Submission of Plans to the Commission.** Pursuant to the policy established under RSA 378:37, each electric utility shall file a least cost integrated resource plan with the commission at least biennially. Each such plan shall include, but not be limited to, the following:

- I. A forecast of future electrical demand for the utility's service area.
- II. An assessment of demand-side energy management programs, including conservation, efficiency improvement, and load management programs.
- III. An assessment of supply options.
- IV. An assessment of transmission requirements.
- V. Provision for diversity of supply sources.
- VI. Integration of demand-side and supply-side options.
- VII. An assessment of plan integration and impact on state compliance with the Clean Air Act Amendments of 1990.
- VIII. An assessment of plan integration and impact on state compliance with the National Energy Policy Act of 1992.
- IX. An assessment of the plan's long-and short-term environmental, economic and energy price and supply impact on the state.

- **§ 378:38-a Waiver by Commission.** The commission may waive any requirement to file least cost integrated resource plans by an electric utility under RSA 378:38, except for plans relating to transmission and distribution.

- **§ 378:39 Commission Evaluation of Plans.** The commission shall review proposals for integrated least-cost resource plans in order to evaluate the adequacy of each utility's planning process. In deciding whether or not the utility's planning process is adequate, the commission shall consider potential environmental, economic and health-related impacts of each proposed option. The commission is encouraged to consult with appropriate state and federal agencies, alternative and renewable fuel industries, and other organizations in evaluating such impacts. Where the commission determines the options have equivalent financial costs, equivalent reliability, and equivalent environmental, economic and health-related impacts, the following order of priorities shall guide the commission's evaluation:

- I. Demand-side management;
- II. Renewable energy sources;
- III. All other energy sources.

APPENDIX 4: Northmark Focus Group Study Findings

**THE COMMERCIAL & INDUSTRIAL
LIGHTING MARKET
IN NEW HAMPSHIRE**

Focus Group Research Conducted for:

New Hampshire Energy Efficiency Working Group

by:

The NorthMark Group
214 South Main Street
Concord, NH 03301

TABLE OF CONTENTS

	Page #
I. EXECUTIVE SUMMARY	
A. Background/Introduction.....	1
B. Methodology.....	1
C. Composition of Focus Groups.....	2
D. Moderator Notes.....	3
E. Major Research Findings.....	4
F. Conclusions/Implications.....	5
II. STANDARD PRACTICES	
A. Fluorescent Lights.....	7
B. HID Lighting.....	8
C. Exit Signs.....	9
D. Controls.....	9
III. DRIVING FORCES.....	10
IV. MARKET BARRIERS.....	11
V. ROLE OF ELECTRIC UTILITY COMPANIES.....	13
VI. ROLE OF ENERGY SERVICES COMPANIES.....	16
VII. TIMEFRAMES AND FUTURE TRENDS.....	17
VIII. APPENDIX	
A. Moderator Guide	
B. Focus Group Participants	

EXECUTIVE SUMMARY

Background/Introduction

The New Hampshire Energy Efficiency Working Group was interested in determining an unbiased estimate of what is considered standard practice for efficient lighting in commercial and industrial buildings in the State of New Hampshire. In that regard, there were several related objectives:

- Understanding the current market situation, how that may have changed over time, how it might change in the future, and reasons for the market structure changes.
- Understanding factors which could be considered "driving forces" as well as those considered "barriers" to the adoption of energy-efficient lighting products.
- Determining whether practices varied in different areas of New Hampshire and whether New Hampshire practices were different than those in other New England states.

Methodology

It was established by the Working Group that focus group research was to be conducted. A Moderator Guide was developed by NorthMark for review and approval by the Working Group (copy in Appendix). Four focus groups were conducted at different locations in New Hampshire as follows:

- Londonderry - April 8, 1999
- Portsmouth - April 12, 1999
- W. Lebanon - April 13, 1999
- Meredith - April 21, 1999
(Note: The original group to represent "the North Country" was to be held in Lincoln, but was rescheduled to Meredith due to lack of committed attendance.)

Composition of Focus Groups

The recruiting goal for each group was to have a balance of industry participants (market actors) in each group - those representing the design community (architects/engineers), those involved in the supply of products (dealers/distributors or lamp/fixture manufacturers), those involved in the installation of products (contractors), and those representative of independent energy service companies (ESCOs) or considered to be independent advisors on energy.

Names of potential participants were identified using two major sources:

- Each working group member was asked to submit names of people in the above categories.
- These names were supplemented using other published sources such as the Bell Atlantic Yellow Pages and SIC directories.

The composition of each group by type of company is summarized below, while the specific names of people attending each group and their company identification are included in the Appendix.

Market Actor Representation in Focus Groups

<u>Company Type</u>	<u>Londonderry</u>	<u>Portsmouth</u>	<u>W. Lebanon</u>	<u>Meredith</u>	<u>Total</u>
Lighting/Fixture Manufacturer	1	1	-	-	2
Dealer/Distributor	2	2	-	-	4
Contractor	1	4	5	3	13
Architect/Engineer	3	-	4	3	10
ESCO/Energy Advisor	2	1	2	-	5
Total	<u>9</u>	<u>8</u>	<u>11</u>	<u>6</u>	<u>34</u>

Moderator Notes

Readers of this report are advised to make a few notations regarding its interpretation:

- It represents the moderator's sense of the important points made and, unless otherwise noted, is felt to reflect the views of participants in all four groups. Readers interested in the verbatim comments made by specific participants are referred to the videotapes submitted with this report.
- The input received from participants represent their perceptions of the market and its players. No attempt has been made to verify the accuracy of these perceptions.
- Focus group research is qualitative rather than quantitative in nature. Readers are cautioned against attempts to extrapolate any findings in a quantitative manner. Broader-based research, including user surveys, is advised to provide the quantification necessary for sound decision-making.

Major Research Findings

A review of the focus group discussions leads to the following summary of major observations.

Each of these are covered in more detail later in the report.

- Standard practice for commercial and industrial lighting in New Hampshire is considered to be as follows: Fluorescent Lights (T8s with electronic ballasts), HID lighting (metal halide), and Exit Signs (LEDs).
- Use of controls, particularly occupancy sensors, is thought to be limited. Primary applications mentioned were bathrooms, private offices, classrooms, and some warehouses.
- There were numerous factors considered to be driving forces in the adoption of energy-efficient lighting: codes/regulations; educational/marketing efforts of manufacturers, distributors, and contractors; more affordable product costs; utility rebate programs; energy service companies (ESCOs); high electric rates.
- There have been numerous factors considered to be barriers to the adoption of energy-efficient lighting: product reliability/suitability; cost; decision-making process/factors; education; lack of interest/need; availability of reasonably-priced design services; uncertainty about de-regulation; stocking issues.

- While the availability of utility rebates has apparently had a direct effect on the sales of energy-efficient products, the overall impact of such programs in New Hampshire was thought to have been considerably less than in other states such as Massachusetts and Connecticut. Programs were thought to have been on the decline in recent years due to lack of funding.
- The major complaints about these rebate programs have been their "on again/off again" nature due to lack funding, their bureaucratic nature requiring considerable paperwork, and their limited application to certain products. Specific programs cited as examples of "best practices" included New Hampshire Electric Cooperatives' rebate program of 20% "across the board" and United Illuminating's program in Connecticut which provided "a level playing field for all technologies".
- The role of ESCOs received mixed reviews. While their overall presence has been viewed positively from the perspective of creating awareness of energy-efficient practices, some market participants had negative early experiences involving people not considered knowledgeable or professional in their business operations. Their collective impact was thought to have been diminished in recent years as the availability of utility rebates have lessened.
- The future of the commercial and industrial lighting market was seen as quite unclear. With regard to technology, most thought it likely that a different light source (perhaps photo-voltaic, sulphur, or fiber optics) would become standard before T5s would replace T8s on a wide spread basis. Most felt that while utility rebate programs would continue to decline, the exact role of electric utilities was uncertain due to de-regulation. Contractors voiced concern about utilities developing services that would compete with the private sector. ESCOs were thought to be declining in number, while becoming larger in size, and (some thought) less independent from utility companies.

Conclusions/Implications

It is the sense of the moderator, based on reviewing the focus group discussions, that while there are still selected opportunities in the marketplace, the majority of T12 to T8 conversions have already taken place and the sales curve has peaked. According to focus group participants, there remain a few barriers to overcome:

- Remaining prospects are considered to be very price conscious or more concerned about aesthetics than cost-savings. It will be a "tougher sell" without rebates and require continued product improvement efforts - for example better reliability and color rendering for compact fluorescents.

- Continued education and marketing efforts will be required by all market participants - focused on the general public as well as contractors to provide the details on benefits and cost-savings to be expected.
- Decision-making is being postponed due to uncertainty about de-regulation, future electric rates, and the role of the electric utility companies.

After reflecting on the focus group discussions, it is the feeling of the moderator that the energy-efficient lighting marketplace has perhaps also been impacted by another "barrier" - a perceived lack of cooperation among industry participants. There seemed (to the moderator) to be many "turf issues" as evidenced by numerous "war stories" heard from most all industry participants:

- ESCO representatives had problems dealing with the utility companies.
- Similar stories were heard from contractors about ESCOs.
- Some frustration was heard from contractors about lack of reasonably-priced design services or inadequate stocking levels on the part of dealers.
- Architects expressed feelings that aesthetic issues were often overlooked in the emphasis on energy-efficiency.

It is the opinion of the moderator that future success in further adoption of energy-efficient lighting in the commercial and industrial market in New Hampshire may well be dependent also on the development of a spirit of partnership among industry participants to find a way to work together so that all will benefit in a de-regulated marketplace.

STANDARD PRACTICES

Participants were asked what they considered to be current or standard practice (what's being specified, stocked, installed) with regard to several product types (fluorescent lights, HID lighting, Exit Signs, and Controls (Dimmers, Occupancy Sensors, etc.).

Fluorescent Lights

When asked about current practice for fluorescent lighting, the unanimous, immediate response from participants in all groups was - T8 lighting with electronic ballasts. Upon further discussion, this was felt to be true for all new construction, but there were some differences noted with regard to the retrofit market. They are listed below in no particular order of importance.

(1) *Quantity* - It was sometimes felt to be easier to replace a small quantity of T12s with T8s while harder for large quantities unless the cost had been budgeted.

(2) *Owners vs. Renters* - There were two issues here. One relates to length of time (and potential payback period). As one person commented, "If you're going to be in the space for 4-5 years, (installing T8s) is a no-brainer." The other issue relates to who's paying the electric bill. While owners might generally be more apt to listen to the cost savings issue, there was thought to be less incentive for the owner to save money if the total electric bill is being shared by tenants. However, if a tenant's space is metered, (s)he was thought more apt to be interested in energy efficient products.

(3) *Size of Company* - Large corporate customers, thought to have more financial resources, and be more concerned about "bottom line" issues (costs) were described as having been "sold on T8s", while many smaller and mid-size companies had not yet been convinced to do so.

(4) *Geography* - One of the best perspectives on differences by geography came from dealer/distributor participants in the Londonderry group who had experience in all New England states. The sense was that Massachusetts customers were generally less price sensitive and that market had been heavily influenced to install T8s by utility rebates over the years. By comparison, Northern Maine and Vermont were characterized as still heavily "T12 country". New Hampshire (particularly south of Concord/Manchester) was thought to have lagged Massachusetts but T8s were now considered standard practice.

Within New Hampshire, the sense of the moderator was that the "North Country" lagged somewhat behind other more populated areas of the state. This is based on statements that current stocking practices there left something to be desired, and that most rebate programs were targeted toward large companies which are less prominent there as well.

(5) *Level/Type of Decision-Making* - Somewhat related to the size of company issue, comments were heard that typically the higher the level of the decision-maker, the more apt(s) he is to make a business decision and invest in energy efficient technologies. The lower level decision-maker (for example a maintenance person) might view the "no maintenance" features as a threat to his/her job or be more apt to "do what's easiest" and therefore replace with T12s.

Most participants acknowledged that there "are still a lot of T12s out there" and where there is a tight budget, T12s may still be proposed. One person in the W. Lebanon group cited a statistic that "80% of the square footage of space built in the country still has T12s". He went on to acknowledge, however, that much of this space was thought to be "triple net lease" or government space and therefore less likely prospects to convert. The general sense from most participants, however, was that most of the likely prospects had already converted and those left were very resistant to change for either price or perceived quality of light issues.

HID Lighting

The general consensus among participants in all groups was that current practice for HID lighting involved Metal Halide technology. Compared to High Pressure Sodium, some consider it expensive, although users were thought to like the features such as a whiter light and the ability to start in colder weather. In particular, reference was made to "PulseStart" lamps which have a shorter/"hot" re-strike capability, good color rendering, and longer life (50,000 hours). High Pressure Sodium lamps were still thought to be used, however, in certain outdoor applications like parking lots and for security lighting. Some towns, for example, want to retain the yellow, "gas light"- look for street lights. Indoor applications mentioned included warehouses, gymnasiums, and hockey rinks.

Participants in the Meredith focus group questioned whether the use of Metal Halide in rural areas provided too much light (pollution). Some gas stations, for example, were thought to appear too bright and this apparently is an issue with a proposed WalMart store in Plymouth.

Exit Signs

Here again there was unanimous response - in this case that current practice involved LED technology. It was acknowledged, however, that this was often a "tough sell" although assisted by large (30%) rebates and improved design efforts by the manufacturers.

Controls

Discussion about controls indicated that they were seen as expensive with limited market acceptance. Stories were heard about dimmers requiring 100 hours burn-in and timing mechanisms for occupancy sensors often not being reliable. Some contractors had negative first experiences and have stopped installing them. Specific applications for occupancy sensors were mentioned as follows: schools (bathrooms, classrooms), large distribution centers/warehouses, large corporate offices (bathrooms, private offices). There were two mentions of experimenting with "daylight harvesting".

DRIVING FORCES

Participants were asked about factors they considered to be "driving forces" in the adoption of energy-efficient products - factors that had a positive effect, that perhaps increased the rate of adoption, or were supportive of increased sales of such products. Participants often made reference to these factors throughout the discussion without being asked directly about them. These factors are listed below in no particular order of importance.

- *Codes/Regulations* - State building/energy codes typically specify energy-efficient products for new construction, while Federal regulations such as EPA set standards for the manufacturers. Also cited were IES guidelines and recommendations.
- *Marketing Efforts* - The feeling was that the general public today is better informed about energy conservation issues and the cost savings related to use of energy-efficient products. Several contractors expressed the feeling that advertising directed at the general public has helped support their sales efforts (corporate decision-makers are consumers too). Marketing and education efforts by lamp manufacturers directed at the trade have also been helpful.
- *Affordability* - The cost of the new technology has come down considerably since its first introduction such that some have characterized T8s as costing

"not much more than T12s". There is still some resistance to the "first cost" issue, however.

- *Utility Rebates* - Most participants acknowledged that the availability of rebates had definitely stimulated sales of energy-efficient products. The overall impact of these programs has thought to have been greater in other states like Massachusetts and Connecticut than in New Hampshire, however, due to the amount of funding those states' utility companies provided.
- *Role of ESCOs* - While a few participants (ESCOs and contractors) felt that ESCOs have received a bad reputation due to early entrants who were not professional or well trained and saw an opportunity to "make a quick buck" at the time of utility company rebates, most admit their presence has raised the level of awareness of energy-saving products and services.
- *High electric rates* were thought to have been instrumental in customers seeking cost-saving alternatives.

MARKET BARRIERS

Participants were asked about factors they considered to be "barriers" to the adoption of energy-efficient products - factors that perhaps inhibited the rate of adoption or held back sales of such products. Participants often made reference to these factors throughout the discussion without being asked directly about them. These factors are listed below in no particular order of importance.

- *Product Reliability/Suitability* - Stories were told about early problems with electronic ballasts which have now been overcome. Some now feel that compact fluorescent lights today have some reliability problems in addition to poor color rendering. Most participants expressed a reluctance to endorse unproven technology. Some contractors indicated they personally install new product in their home to test them first.
- *Cost* - While the cost of T8s has dropped over time, the remaining customer prospects have been characterized as very price sensitive and for whom the "first-cost" issue is still an issue given the reduction of rebate programs.
- *Decision-Making Process/Factors* - Several participants described how slow the decision-making process can be and frustration over the fact that a project could have paid for itself within the time it took to make a decision. Some described possible job-security situations where no-maintenance features of

new technology may actually be viewed as a threat to a lower-level decision-maker (maintenance person).

- *Education* - Each group typically commented about the continuing need for education at two levels: (1) customer education - Suggestions involved preparing "case studies" of real companies who have adopted and the cost-savings and other benefits that have accrued. Some referred to this as the "show me" attitude where the customer is skeptical of a sales pitch and needs to be shown real examples of how others have benefitted. Another suggestion was to provide samples for customers to try. (2) contractor education - Several voiced a need for more knowledge which could be provided by distributors or manufacturers in the form of hard facts and details useful for contractors to assist in customer decision-making.
- *Lack of Interest/Need* - Not all prospects were considered receptive the "energy-efficient" message. For some, there are aesthetic issues that are more important. Retail stores, for example, may be more concerned about how their products look when displayed in showcases. All groups with the exception of Meredith felt that there was an inverse relationship between sales of energy-efficient products and the economy. The point was made that times are good today for most businesses. Since they are profitable, there is less concern about cost-savings measures compared to recessionary times.
- *Availability of Reasonably-Priced Design Services* - This was a particular issue with the W. Lebanon group. The feeling was that without design services, customers would be less apt to adopt new technology.
- *Uncertainty About De-Regulation* - The line of reasoning here was that people were postponing decisions until the future of electric rates was more clear.
- *Stocking Issues* - This was a particular issue that came up in the Meredith group and to a lesser extent among those in the W. Lebanon group. Contractors acknowledged difficulty obtaining certain products in small quantities. This was compounded by the tendency of dealers to hold orders until they had larger quantities before submitting them to their regional distributor.

ROLE OF ELECTRIC UTILITY COMPANIES

Participants provided numerous comments about the perceived role of electric utility companies in the adoption of energy-efficient products. The two areas receiving most comment were the rebate/incentive programs and participation in the "energy services" business (providing consultation, energy audits, and arranging for the installation of lighting products).

(1) *Rebate/Incentive Programs*

The general sense was that utility rebate programs have had a definite impact the sales of energy-efficient lighting products and were thought to have "driven" the retrofit business in past years - early '90s. (This impact, however, was downplayed by the two ESCO representatives in the Londonderry group and most of the Portsmouth group.) The overall impact, however, was acknowledged to have declined in recent years, to have been less than in other states such as Massachusetts, Connecticut, and Maine, and to have been greater had the major utility (PSNH) not "run out of money" for these programs.

A major complaint heard about these incentive programs was their disruptive, "start/stop" nature related to the availability of funding. Other complaints were heard about the "bureaucratic" nature of the programs which often required considerable paperwork and were felt to be confusing to customers. Some mentioned a dislike of the fact that these programs are generally rate-payer funded. One engineer in the Londonderry group felt that the rebate money would have been better spent reducing electric rates or used for an advertising program promoting energy-efficient products. Engineers and dealers generally commented that they were not actively involved with rebate programs preferring to leave the decision and effort up to customer.

A couple of comments were heard about a perceived unfairness of these rebate programs not being open to all parties and not supportive of good lighting design since they focus only on products. An ESCO representative in the W. Lebanon group cited a program offered by United Illuminating in Connecticut that based its rebates on payback periods independent of the particular products involved thereby allowing a "level playing field" for all technologies. New Hampshire Electric Cooperative was also cited a few times in various groups as providing a good example since its program provided a 20% rebate across the board on total installed cost for any energy-efficient program.

References to other New Hampshire electric utility rebate programs were scattered throughout the discussions:

- Granite State Electric - "set artificial requirements for 85% efficiency"
- "bureaucratic, but tried to do the right thing"
- "successful for a while; lot of re-lamping"

- "2% surcharge to pay for rebates but still keep rates comparatively low; program now complicated"
- "good experience"

Connecticut Valley - "pulled funding at 11th hour"

(2) *Involvement in the Energy Services Business*

Some participants (Londonderry, W. Lebanon, and Meredith) were critical of the utility companies being involved in providing energy audits and providing or arranging for the installation of lighting products. Particular criticisms heard were:

- ESCO representatives in the Londonderry group were particularly critical of PSNH personnel who (they felt) were perceived as lighting experts by the customer but they characterized as unqualified to provide realistic estimates of energy savings. Participants in the Portsmouth group, however, generally felt that utility company personnel were knowledgeable to conduct audits.
- Contractors in the W. Lebanon and Meredith groups felt strongly that regulated utilities (NHEC, PSNH) should not be hiring contractors for installation services which compete with the private sector. They would prefer that utilities provide advisory-only services.

Regarding the future role to be played by utility companies in terms of the adoption of energy-efficient lighting, there were two schools of thought reflected in the discussions. Most people felt utilities would be less involved in providing financial incentives than in the past since their role is expected to be quite different in a de-regulated electric marketplace. The sense was that utility companies may well become distributors-only rather than producers and thus there would be less incentive for them to offer rebates or promote energy conservation. On the other hand, a few people cited examples like NHEC and PSNH that have developed Energy Services Divisions which are looking for new sources of revenue and thus might be competing with private sector firms for installations and services in a de-regulated environment.

ROLE OF ENERGY SERVICES COMPANIES

Participants had the opportunity to comment about the role of Energy Services Companies (ESCOs) in the market. While there was not much discussion on the subject in general, the comments typically reflected the view that many of these companies were established in the early 1990s seeking an opportunity to make money on retrofit work related to utility company rebates. Some of the early entrants were characterized as salespeople without the knowledge or expertise

to conduct audits and therefore often calculated false estimates of savings. This gave the industry a bad reputation with customers and contractors who may have been involved in installation of products.

One contractor in the Meredith group expressed strong feelings that ESCOs have had more of a negative than positive impact on the market for these same reasons. He felt they were apt to bid low to get jobs and then come back later with changes and add-ons which alienated customers and contractors who dealt with them.

Over the years, the number of these companies was thought to have declined, while those remaining were thought to be larger, more professional, and (some felt) more likely to be controlled by an electric utility company. While most felt the role played by ESCOs had declined over the years, some mentioned the importance of their role as educators continuing in the future. It was acknowledged by ESCO representatives themselves that they will undoubtedly need to diversify their services in the future.

TIMEFRAMES and FUTURE TRENDS

Participants were asked about timeframes regarding the rate of adoption of energy-efficient products and their expectations for the future.

Characterizing the product life of T8s proved elusive to the participants and there were inconsistent responses the timeframes involved. While some felt T8s have been around for 20 years, the more common response was that they were first introduced about 10 years ago. Early versions of the electronic ballasts, however, reportedly had significant reliability problems and therefore sales were stagnant for 3-4 years until these problems were resolved and the product received more widespread endorsement.

With regard to the future, most participants' "crystal ball" could best be described as "cloudy".

- Most felt T5s, for example, would not necessarily be the general replacement (next generation) for T8s. The sense was that T5s have had limited usage (niche markets involving smaller applications such as jewelry showcases) in the U.S. to date and that its future, more wide-spread adoption would be hindered by the fact that fixtures are just now being built and since it is metric, it wouldn't fit easily into ceiling tiles.
- Many felt that, since the rate of new technology development is so rapid, a completely new light source might replace fluorescents. Some of those mentioned included photo-voltaic, sulphur, and fiber optics.

- Compact Fluorescent Lights can be expected to improve with regard to color rendering and cost.
- Environmental issues were expected to become more apparent regarding the disposal or re-cycling of lead and mercury lamps.

APPENDIX

Focus Group Participants

<u>Location</u>	<u>Name</u>	<u>Company Name</u>	<u>Type of Company</u>
Londonderry	Karl Frank	Lee Berard & Consultants	Architect
	Christopher Miele	M & M Electrical Supply	Distributor
	Tammy Sportum	Ralph Pill Electrical Supply	Distributor
	Jay Taylor	Advanced Energy	ESCO
	Charles Ackroyd	A & K Engineering	Engineer
	Meghan Grady	LighTec	ESCO
	Mark Falardeau	M.H. Falardeau Electric	Contractor
	Heidi Connors	Charron, Inc.	Lighting Mfg Rep
Portsmouth	Rick Jennings	Kohlhase Electric	Contractor
	David Lane	CED/Gilman Electric Supply	Distributor
	Neil Vilders	Vilders Electric	Contractor
	Mike Oian	Mike Oian Company	ESCO/Advisor
	Scott Peters	Ralph Pill Electric Supply	Distributor
	Lis Wilson	Osram Sylvania	Lighting Mfg.
	Kenny Adair	Power Pro Electric	Contractor
	Jeffrey Jacobs	Carroll Jacobs Electric	Contractor
W. Lebanon	Doug Heaton	ESCO, Inc.	ESCO
	Peter Schaal	Schaal Electric	Contractor
	Jeffery Brown	EnvironTech Industries	ESCO
	Bob Crino	LTD, Ltd.	Contractor
	Kevin Hurley	Hurley Electric	Contractor
	David Dow	Double D Electric	Contractor
	Brian Bennett	T & M Associates	Engineer
	Bernard Benn	B.L. Benn Architects	Architect
	Steven Richard	Richard Electric	Contractor
	Chris Hebb	Dynamic Integration	Engineer
	Victor Reno	Reno Engr. & Lighting	Engineer/Design.
Meredith	Lee Carroll	L.F. Carroll, P.E.	Engineer
	Jim Puglisi	A-Phase Electric	Contractor
	Ernest Fredette	Oak Hill Electric	Contractor
	Keith Hemingway	Keith Hemingway	Architect
	Kim Frase	Frase Electric	Contractor
	Norman Larson	Christopher Williams	Architect

APPENDIX 5: Proposed Low Income Energy Efficiency Program

The following description of a low-income energy efficiency program for New Hampshire was recommended by the Group's Low Income Subcommittee and approved by the Working Group.

1) Program Design

The proposed low-income program for New Hampshire could annually serve 2,500 low income households statewide once operational maturity is achieved. The program would need to ramp-up over several years to ensure a logical development of the necessary infrastructure. Eligibility is based on income at or below 150% of the Federal Poverty Guidelines. The eligibility levels would thus be the same as the New Hampshire Electric Assistance Program. Eligibility would not be based on electric consumption.

The delivery of products and services would reflect the best elements of regional program activities for education, weatherization, and other energy efficiency measures including appliance replacement. The program objective is to treat each household as a custom job in order to optimize energy savings potential based on individual circumstances.

Consistent with the experiences of other low income programs, electric savings of at least 1,000 kWh per program participant per year is projected. The projected electric savings estimate is an average and reflects savings from weatherization and appliance replacement.

The proposed program design integrates important programmatic components, such as customer education and active customer participation, into the process of delivering cost-effective weatherization and other energy efficiency measures. As part of the customer education component, technically-trained weatherization providers and auditors would also be trained to educate low income customers about effective energy consumption decision-making.

In light of both the significant undesirable market conditions that exist and are expected to persist for low income customers and the fact that at 2,500 participants per year only half of the estimated eligible households could be reached in a decade, the Group does not recommend that a market exit strategy be developed for the low income residential subsector at this time. [see report of the Low Income Subcommittee dated April 20, 1999 - Appendix 5A, and the Subcommittee's Low Income Market Barriers Presentation of November 24, 1998 - Appendix 5B.]

2) Program Administration and Implementation.

The proposal provides for program administration through integrated program coordination of planning, training, service delivery and evaluation. This coordinated approach is more fully described in the April 20, 1999 report of the Low Income Subcommittee entitled "Administration and Funding for a Low Income Energy Efficiency Program." [See Appendix 5A]

The recommended administrative model provides for a coordinated, integrated approach while maintaining the option for utility-specific implementation. A utility could thus retain administrative oversight of a low income program in its service territory but still access the benefits of a coordinated statewide administrative system, such as planning functions, bulk purchasing, technical training, and program evaluation. The recommended approach would ensure adherence to uniform program standards, as well as access for all low income customers. Significant economies of scale could thus be achieved through this hybrid administrative model.

3) Budget and Funding

The program cost is estimated to be \$2.5 million per year when serving 2,500 customers. Per household expenditure is expected to be in the range of \$900 per baseload customer and \$1,500 per electric space heat customer.

The Commission determined in its May 10, 1999 oral deliberations that funding for low income energy efficiency programs should not come from the Electric Assistance Program ("EAP") fund. In addition, the April 20, 1999 report of the Low Income Subcommittee demonstrated that it is unlikely that significant EAP funds would be available in the near term for low income energy efficiency programs based on the current planning assumptions and projections for the Electric Assistance Program.

Nevertheless, once the EAP is fully operational, the Group agrees that the Commission should review the EAP program to determine if any EAP funds can be made available for low income energy efficiency programs. Such a determination would depend on factors including, but not limited to, attainment of EAP goals, sufficient funding for the arrearage component, and the size of any waiting list. The determination could also be significantly impacted by the Commission's decision with respect to the source of funding for utility start-up costs and on-going utility administrative expenses for EAP.

Finally, the Group further recognizes that it may be necessary to consider some modifications to the proposed design for the statewide low income program, such as budget size, target population penetration rate, and ramp-up, once energy efficiency programs are proposed and designed for other subsectors. The ultimate goal is to integrate the program designs of the proposed low income energy efficiency program and the Electric Assistance Program recently approved by the Commission. The EEWG recommends that further work on program design include the exploration of opportunities that will allow for the leveraging of other resources, such as the state's Weatherization Assistance Program.

APPENDIX 5A: Report of the Low Income Subcommittee, 4/20/99

Memorandum

To: PUC Energy Efficiency Working Group
From: Low Income Energy Efficiency Subcommittee Members
Date: 4/20/99
Re: ADMINISTRATION & FUNDING FOR A LOW INCOME ENERGY
EFFICIENCY PROGRAM

The queries in the Public Utilities Commission's (PUC) March 20, 1998 DR 96-150 Rehearing Order include "what level of funding is appropriate for low-income energy efficiency programs and does sufficient funding exist in the \$13.2 million low-income systems benefit charge to use for energy efficiency programs for the eligible low-income customers"? (pg. 85).

Recommendations Summarized:

The recommendations summarized below are from members of the Low Income Energy Efficiency Subcommittee (LIEES). Please refer to the specific sections for a more detailed review:

Program Funding Level: \$1.5 million funding level in the first year and \$2.5 million funding level by program year three.

Funding Source: Under the assumptions set forth herein, LIEES does not believe sufficient funding exists in the low-income systems benefit charge to sustain both low-income affordability and energy efficiency activities at this time. Please refer to Section I for further details.

Program Administration: LIEES recommends adopting a hybrid program delivery which would provide for a centralized integrated approach while maintaining the option for utility specific programs. See Section II for further details.

Market Exit Strategy: LIEES believes a market exit strategy should not be instituted for the low-income residential subsector at this time. Please refer to Section III for details.

I. Funding Level & Calculations:

In deciding whether sufficient funds exist from the approved low income assistance systems benefit charge: (PUC February 28, 1997 DR 96-150 Final Plan, pg. 95, 96 and in accordance RSA 374 F: 4:VIII), LIEES performed the following calculations:

Projected First Year Costs:

- \$13,200,000.00 = available funding
- \$1,500,000.00 = Costs for LI Energy Efficiency Program¹⁰
- \$2,098,475.00 = CAA EAP Admin & Start-up Costs¹¹
- \$55,652.00 = ECS Admin & Start-up Costs¹²
- \$1,800,000.00 = Pre-program Arrearage Fund Match¹³
- \$7,875,000.00 = EAP Credits using only 15,000 households x \$525.00 average credit¹⁴

\$129,127.00 balance

However, LIEES is also aware of the following outstanding issues that would seriously impact the available funding:

- The PUC Economics and Finance Staff recommended that all EAP-related costs should come from the low-income SBC. This includes expenses for the six utilities. This could add \$2,100,000.00 to the EAP budget.
- If the number of EAP participants were increased to the minimum equivalent of the statewide Fuel Assistance Program than funds for the EAP credit would be based on 17,000 households. First year EAP credits would be projected at \$8,925,000.00.
- If EAP ramped-up to full participation rate of 25,000 households as recognized in the Commission's Final Plan, EAP \$525.00 credits would amount to \$13,125,000.00.
- Computations of EAP credits showed that PSNH general use customers' annual credit ranged from \$349.00 to \$841.00. The annual average credit could increase to \$595.00. Using the \$595.00 credit would increase the budget by \$1,050,000.00.

Consequently, any deviation in the projected numbers would seriously curtail the availability of

10 3/2/99 LIEES presentation to the Energy Efficiency Working Group. In the first year, the program expects to serve only 1500 low-income households. By year three, the program should serve 2500 households at an annual cost of \$2.5 million.

11 See projected budgets submitted by the Community Action Agencies (8/18/98 EAP Policy Recommendations, Attachment B).

12 See projected budgets submitted by ECS (8/18/98 EAP Policy Recommendations Attachments C).

13 Since data is not available as to the current number of low-income customers who are in arrears with their electric company, assumptions were all EAP participants would begin with pre-program arrears greater than \$240.00. Hence would require the \$10.00 EAP fund match.

14 Since EAP will not achieve full participation in year one, calculations were projected at 15,000 households as opposed to the maximum of 25,000 households. Serving 15,000 households in the first year appeared conservative since the statewide Fuel Assistance Program can ramp-up to at least 17,000 households in less than six months. The \$525.00 credit amount is a conservative estimate based upon averaging the statewide total cost calculations submitted by The Electric Utility Restructuring Collaborative January 27, 1997 Final Comments to the NH Public Utilities Commission.

funds from the low-income assistance SBC. LIEES believes that energy efficiency programs for low-income customers need to continue and that a low-income energy efficiency program should not be sacrificed due to an affordability program. Nor should the affordability program be jeopardized due to a low-income energy efficiency program. Both programs should be available to deal with the issues of affordability, manageability and short-term savings, which ultimately affects not only low-income customers but all ratepayers. Finally, LIEES is sensitive to the fact that RSA 374 F: 4:VIII stipulates the low-income systems benefit charge sunsets in the year 2003.

Recommendation: In the first year, plans to support funding a LI Energy Efficiency Program initially should not come from the \$13.2 million low income assistance systems benefit charge. If the assumptions for EAP calculations are incorrect and if the EAP funds are not fully utilized in the first year, then the group recommends the Commissioners utilize the low-income SBC to offset the costs of a low-income energy efficiency program. In the second year of the affordability program, the Commissioners should again assess if monies are available from the \$13.2 million fund to offset the costs of a low-income energy efficiency program.

II. Integrated Coordination of Low Income Energy Efficiency Programs:

A hybrid type of administration for a coordinated delivery of low-income energy efficiency programs would ensure uniformity in program standards and access for all low-income customers. Utilities would be expected to adhere to an established level of program quality and geographic distribution. However, a utility that wishes to retain administrative oversight of its particular low-income energy efficiency programs may do so while still accessing the benefits of a coordinated statewide administration system. Bulk purchasing, technical training, and energy savings and program evaluation are just a few examples.

LIEES proposes that coordinated administration include establishment of three year contracts with status reports due annually. Utilities would then only be required to submit for PUC approval the low-income residential program in their C&LM filings every three years. Utilities would be required to submit yearly status reports to the PUC. This should reduce the time and expense of yearly C&LM filings and would not disrupt the continuity of a low-income energy efficiency program to eligible residential customers.

Other benefits include:

- Economies of scale, bulk purchasing, efficiency
- Planning, uniformity, consistency, training opportunities
- Data collection, shared database
- Record-keeping, monitoring, evaluation of overall program
- Enhanced leveraging of funding (with federal weatherization dollars, other private and public sources)
- Promotes uniformity in energy savings

Administrator Criteria:

The advantages of a third party fund administrator include "economies by the elimination of duplicative tasks and cumbersome decision-making, ensuring the funds are administered in a cost-effective and competitively neutral manner" (NYSERDA). LIEES recommends the administrator

could be a non-profit organization, for-profit business, or state agency, and thus has no preconceived notion as to the type of organization that should provide the centrally coordinated services. An Advisory Board is envisioned to assist in program implementation and operations but ultimate authority would reside with the Commissioners. The selection process could be put out to bid, with an independent bid process for the implementers.

LIEES recommends the following criteria be included in the considerations when choosing an administrator:

- Experience with and knowledge of other low income programs
- Familiarity with and sensitivity to the low income community
- Ability to succeed in marketing and outreach to the low income community
- Budgetary and record-keeping capacities
- Ability to access other funding sources to leverage additional program dollars.

Other Models:

LIEES is currently aware of two centralized energy efficiency administrators as models for successful programs: NYSERDA and Wisconsin Energy Conservation Corporation (WECC).

Key aspects of NYSERDA's program include:

- Using a competitive process to select projects.
- An open, stakeholder-based planning process.
- Leveraging system benefits funds with weatherization and other resources.
- An Advisory Group to help set direction of NYSERDA's administrative role
- Administering SBC-funded activities taking into account the programs of utilities providing interim services, and facilitating transition from interim programs to NYSERDA-administered programs.

III. Low Income Residential Market Strategy:

LIEES recommends that in light of persistent undesirable market conditions it is not realistic to try and devise a market exit strategy for the low income residential subsector at this time. The rationale for this recommendation is set forth below.

Undesirable Market Conditions:

Low-income customers appear to face "sufficiently significant undesirable market conditions" to warrant an exploration of program design targeted at this residential subsector. (See Minutes of Meeting of the EEWG, 11/24/98.)

Undesirable conditions include (Low Income Market Barriers Presentation, 11/24/98):

- high initial capital costs
- lack of access to capital
- high implicit discount rates/payback periods
- high proportion of low income renters

- split incentives between landlord and tenant
- high mobility rate of low income renters
- low education levels
- language barriers

Poverty in New Hampshire:

- Thousands of low-income households are recipients of state and federal welfare programs and food stamps
- 50,000 households have incomes below 150% of the federal poverty level (See PUC Final Plan, 2/28/97; Low Income Market Barriers Presentation, 11/24/98)

Fuel Assistance & Weatherization Programs (11/24/98 ECS Presentation):

- 17,500 Fuel Assistance households in 1998 program year
- 4,800 applicants for Weatherization services in 1997 with no program marketing
- 660 units weatherized in 1997 program year
- US DOE regulations prohibit re-weatherizing homes weatherized after 1985

Housing Stock (NH Office of State Planning; LI Market Barriers Presentation, 11/24/98):

- 503,000 housing units in NH
- 40% of homes built prior to 1960

Proposed NH Low Income Energy Efficiency Program:

- Proposed program design to service 2,500 low income units per year effective with the 3rd program year (See NH Concept Presentation, 3/2/99)
- 15 year projected weatherization measures life cycle
- Comprehensive education and weatherization component
- Under the proposed program design, it would take 10 years to serve one-half of the low-income subsector.

Benefits of Energy Efficiency Improvements

Low-Income Subcommittee
of the
Energy Efficiency Working Group

January, 1999

Note:

*Appendix 5B and 5C
should be reversed*

BENEFITS OF ENERGY EFFICIENCY IMPROVEMENTS

1. Reduces electric bills; increases bill affordability ✓
2. Promotes efficient use of electricity; discourages wasteful use; promotes energy savings ✓
3. Reduces need for future electricity generation ✓
4. Improvement in living conditions and housing stock
5. Contributes to economic stability and growth
6. Promotes growth in jobs
7. Reduces environmental stress; reduced air emissions
8. Increases health and safety by reducing reliance on unsafe alternative heating sources and equipment
9. Helps attain minimum temperature comfort level in the home
10. Reduces public health costs
11. Promotes more affordable housing
12. Less housing abandonment, forced mobility, and homelessness
13. Increases end-use amenities through modern, efficient end-uses
14. Moderates price increases through reduced demand growth ✓
15. Customer payment benefits ✓
 - a) Improvements in low income customer payment patterns
 - b) More regular payments
 - c) More frequent payments
16. Beneficial effect on credit and collection costs ✓
 - a) Reduces credit and collection expenses
 - b) Reduces uncollectables; reduces write-offs of bad debt
 - c) Fewer disconnections for non-payment; reduction of disconnection expenses
 - d) Reduction in arrears
 - e) Reduces need for use of legal system for collections
17. Promotes positive customer relations with utility ✓
18. Promotes self-esteem of low income customers through regular bill payment ✓
19. Reduced working capital requirements
20. Reduction in scope and complexity of regulatory rate cases and attendant expenses
21. Increase in time value of arrears (collecting less now vs. more over a longer time period)
22. Increase in total revenues (collecting most of a reduced bill vs. less of a higher bill) ✓
23. Redirects dollars from out-of-state energy suppliers to in-state energy firms
24. DSM "spillover" and market transformation
 - a) Participants adopt non-program measures
 - b) Non-participants adopt program measures and non-program measures

- c) Encourages market transformation measures
25. Reduced demand on local property tax revenues for electric crisis assistance

BIBLIOGRAPHY

- I. A Guide to Low-Income Energy Efficiency, NCLC, 1996.
- II. A Regulatory Response to Low-Income Energy Needs in Colorado: A Proposal. R. Colton, September 27, 1990.
- III. An Integrated Approach to Low-Income Energy Affordability for a Restructured World, 1998, New Jersey. E-Team Partners Program.
- IV. Direct Testimony of Roger Colton, presented to the Philadelphia Gas Commission on behalf of Philadelphia Public Advocate, November, 1992.
- V. Energy Efficiency Investments Targetted to Low-Income Households, Comments of Nancy Brockway, DR96-150, NHPUC, December 6, 1996, pp. 2, 3.
- VI. Electric Utility Restructuring Collaborative Final Comments, dated January 27, 1997, DR96-150, Chapter 12, Energy Efficiency, page 4.
- VII. Final Plan: Restructuring New Hampshire's Electric Utility Industry, NHPUC, DR96-150, February 28, 1997, pages 95-97.
- VIII. Identifying Savings Arising From Low-Income Programs, R. Colton, NCLC, April 2, 1993, pp. 16, 17.
- IX. New England Power Service Company. Final Report. Process and Impact Evaluation of NEPSC. Appliance Management Program, Volume 1, July 10, 1998.
- X. Niagra Mohawk Power Company. "A Customer Service Solution to Low-Income Inability to Pay."
- XI. Non-Price Factors of Boston Edison's DSM Programs: A Review of the Societal Benefits of Energy Efficiency. Vol. 2: Technical Report. Selected Chapters. Tellus Institute, August 1, 1995.
- XII. PA PUC Final Rulemaking Order, Docket No. L-00960118, Regulations Regarding Low-Income Usage Reduction Programs, August 28, 1997.
- XIII. Partnerships for Energy Efficiency. NEES. September 1, 1998.
- XIV. Utility Financed Low-Income Energy Conservation, R. Colton, NCLC, April, 1991.

Benefits of Energy Efficiency Improvements

I. A Guide to Low-Income Energy Efficiency, NCLC, 1996.

1. Chapter 6. Expanded "Avoided Costs" from Low-Income DSM, pages 29-33.
 - 1) Credit and collection costs. Includes: shut-off notice; personal contact via telephone and premises visit; disconnection; and, reconnection of service.
 - 2) Bad debt.
 - 3) Regulatory expenses, including: rate case expenses; rulemaking on credit and collection matters; and, customer complaints regarding inability to pay.
 - 4) Payment plan negotiation.
 - 5) Credit agency fees.
 - 6) Lost time value of arrears.
 - 7) Forced mobility.
 - 8) Diversion of revenue from payment of current bills to payment of other fees, such as late payment charges and reconnection fees.
2. Chapter 7. Expanded "Avoided Costs" from Low-Income DSM: Working Capital, pages 35-38.
 - 1) Savings through reduction of working capital allowance including: interest on debt; return on equity; and tax on equity return.
 - 2) Avoided working capital can be one of the biggest sources of avoided costs in targeted low-income conservation programs.
3. Chapter 8. Expanded Avoided Costs: Inability to Pay Externalities, pages 39-42.
 - 1) Societal cost/savings not reflected in the utility's revenue requirement:
 - a) Health and safety.
 - b) Housing abandonment.
 - c) Homelessness.
 - d) Legal burdens.
 - e) Customer hostility.

II. A Regulatory Response to Low-Income Energy Needs in Colorado: A Proposal. R. Colton, September 27, 1990.

1. Improvement in payment patterns in R.I.
2. Increase in total revenues.
3. Increase in net revenue.

**III. An Integrated Approach to Low-Income Energy Affordability for a Restructured World. 1998
New Jersey
E-Team Partners Program**

1. Mean estimates of KWH savings are 19%.
Mean participant electric savings is \$123 year - (976 KWH)
2. Conclusion:
 - a) Deep energy savings and meaningful utility bill savings
 - b) There may be significant value to the utility in
 - i) reduced collections
 - ii) and uncollectables costs
 - c) Significant numbers of customers can be moved from chronic payment problems to some minimum level of sustainable energy affordability.

IV. Direct Testimony of Roger Colton, presented to the Philadelphia Gas Commission on behalf of Philadelphia Public Advocate, November, 1992.

1. Pages 7, 8, 9. Wisconsin Arrears Savings, W.G.Co., (April, 1988)
 - 1) Reduced collection costs and disconnection costs
 - 2) Reduced working capital requirements by reduction of the "lag" in collecting bills
 - 3) Reduction of revenues foregone through delinquent payments
 - 4) Reduced consumption

- 5) Reduction in arrears
2. Pages 12-13. Washington State Energy Office.
 - 1) Lower bills
 - 2) More affordable bills
 - 3) Fewer unpaid utility bills
 - 4) Reduced arrearages.
 - 5) Lower utility write-offs from uncollectable debts
 3. Pages 14-18. Externalities costs that can be avoided by targetting DSM to low-income households:
 - 1) Threat to health and safety as a result of disconnect
 - 2) Housing abandonment due to loss of utility service
 - 3) Homelessness as a result of utility disconnections
 - 4) Hostility between low-income customers and utilities.
 - 5) Health and safety as result of a move to alternative sources of primary heat, such as kerosene heaters
 - 6) Use of the legal system for collection of arrears.

V. Energy Efficiency Investments Targetted to Low-Income Households, Comments of Nancy Brockway, DR96-150, NHPUC, December 6, 1996, pp. 2, 3.

1. Usage reduction benefits:
 - 1) Prevents waste of electricity.
 - 2) Increase in end-use amenities through modern, efficient end-uses.
 - 3) Reduction in annual outlay required to support affordable rates.
 - 4) Improvement in living conditions and housing stock that produces better neighborhoods and related spin-off effects on economic stability and growth.
 - 5) Reduces environmental stresses due to generation of electricity.
 - 6) Improvement in payment patterns and household experience and dignity that come with the ability to pay the bill:
 - a. Customers make regular payments.

- b. Customers develop a positive relationship with utility.
- c. Less expense for credit and collection activity.
- d. Fewer disconnections for non-payment.

7) Reduction in arrears.

VI. Electric Utility Restructuring Collaborative Final Comments, dated January 27, 1997, DR96-150, Chapter 12, Energy Efficiency, page 4.

1. Benefits of Energy Efficiency.

- 1) Moderates market electricity price increases by moderating demand growth.
- 2) Reduces environmental impacts by reducing air emissions and demand for new plants.
- 3) Strengthens the economy and creates local jobs by reducing costs for large and small businesses.
- 4) Redirects dollars from out-of-state energy suppliers to in-state energy efficiency firms.

VII. Final Plan: Restructuring New Hampshire's Electric Utility Industry, NHPUC, DR96-150, February 28, 1997, pages 95-97.

- 1. Page 96. Less demand for local property tax revenues to provide crisis assistance.
- 2. Page 97. Positive tax impacts of a low-income assistance program.

VIII. Identifying Savings Arising From Low-Income Programs, R. Colton, NCLC, April 2, 1993, pp. 16, 17.

- 1. Credit and collection savings.
- 2. Bad debt.
- 3. Time Value of arrears (collecting less now is less expensive than trying to collect more over a longer period).
- 4. Regulatory expenses.

5. Diverted revenue (reconnect fees).
6. Diverted revenue (forced mobility).
7. Repeated payment plans.
8. Targeted conservation.

**IX. New England Power Service Company
Final Report
Process and Impact Evaluation of NEPSC
Appliance Management Program, Volume 1, July 10, 1998.**

1. Overall program savings per participant of 1386.5 KWH/yr.
2. The program is a means to reduce electrical consumption.
3. Customers felt that the program helped them to pay their bill on time and lower the bill.

**X. Niagra Mohawk Power Company
“A Customer Service Solution to Low-Income Inability to Pay.”**

1. Affordability and Energy Services Components.
 - 1) Usage reduction.
 - 2) Increased customer cash payments.
 - 3) Reduced uncollectables.

**XI. Non-Price Factors of Boston Edison's DSM Programs: A Review
of the Societal Benefits of Energy Efficiency. Vol. 2: Technical
Report. Selected Chapters. Tellus Institute, August 1, 1995.**

1. Page 149.
Chapter 13.1. Benefits to Low-Income Customers.
 - 1) Health, safety and comfort:
 - a. unsafe alternative heating sources.
 - b. unsafe and inefficient primary heating equipment.

- c. enable use of funds for health needs and better nutrition.
- 2) Affordable housing.
- 3) Low-income housing developers.
- 4) Other impacts:
 - a. Reduction of outside noise.
 - b. Credit counseling and referrals for other low-income services.
 - c. Improved good will between electric company and the low-income customer.
 - d. Improved self-esteem of low-income households.

2. Page 162.

Chapter 14.1. The Costs Associated with Outstanding Bills.

- 1) By reducing the cost of electricity service, DSM programs can increase some customers' ability to make payments on their monthly bills.

3. Page 175.

Chapter 15.1. DSM Spillover and Market Transformation Impacts that tend to extend beyond the original estimates of program savings.

- 1) Participants adopt non-program measures.
- 2) Non-participants adopt program measures.
- 3) Non-participants adopt non-program measures.
- 4) Market transformation.

XII. PA PUC Final Rulemaking Order, Docket No. L-00960118, Regulations Regarding Low-Income Usage Reduction Programs, August 28, 1997.

- 1. Increase in customer bill payment frequency.
- 2. Reduction of utility bills and arrears.
- 3. Reduction in usage.
- 4. Load management.
- 5. Energy conservation.
- 6. Avoided cost of future generation.
- 7. Diminished environment impacts related to energy production and transmission.

8. Increased comfort levels for recipients, safer living conditions, more moderate and manageable utility bills.
9. Improved community relations for utilities.
10. Economic development benefits.

**XIII. Partnerships for Energy Efficiency
NEES
September 1, 1998**

1. 1997 MECO average KWH savings:
 - 1) 1386 KWH
 - 2) \$100/yr.
 - 3) 12% savings

**XIV. Utility Financed Low-Income Energy Conservation, R. Colton,
NCLC, April, 1991.**

Benefits to utility and its ratepayers generally of avoiding credit and collection costs by reducing low-income customers' bills to a more affordable level via DSM.

APPENDIX 5C: Report of the Low Income Subcommittee, 11/24/98

LOW INCOME MARKET BARRIERS

Low Income Subcommittee
of the
Energy Efficiency Working Group

November 24, 1998

CONTENTS

Table of Potential Market Barriers and Supporting Data

Energy Burden: The Cost of Electricity in New Hampshire as a Percentage of Income

Census Data: Poverty in New Hampshire

1998 Federal Poverty Guidelines

State and Federal Public Assistance in New Hampshire

State and Federal Public Assistance Grant Levels As A Percentage of the FPL

Cost of Living in New Hampshire

Lack of Affordability of Shelter

New Hampshire Housing Stock: Statistics

Bibliography: Materials on Market Barriers and Other Issues Related to Low Income Energy Efficiency

TABLE OF POTENTIAL MARKET BARRIERS AND SUPPORTING DATA

Potential Residential Market Barriers	Supporting Data
Information access	
Uncertain technologies	
Consumer credit	
Lack of Knowledge	
Unfavorable pay-back periods	
High initial capital cost	
Difficult installation	

Additional Potential Market Barriers for Low Income Households	Supporting Data
High initial capital cost*	Census Data: Poverty in NH Cost of Living in NH Energy Burden Data
Low liquidity-little cash or ability to raise cash	Census Data: Poverty in NH Cost of Living in NH Energy Burden Data NH WAP/FAP Data State & Federal Public Assistance Grant Levels
Very High implicit discount rates/pay-back periods	Census Data: Poverty in NH Cost of Living in NH Energy Burden Data
Consumer credit*	Census Data: Poverty in NH Cost of Living in NH
Difficult installation*	NHWAP/FAP Data
Tenancy (see three sub-categories below):	
-low-income households commonly live in rental dwellings	Lack of Affordability of Shelter NH Housing Stock Statistics
-split incentives between landlord & tenant	National Data - see Bibliography, e.g., Colton
-high mobility rate of low income renters	National Data - see Bibliography, e.g., Colton
Language barriers - faced by disproportionate number of low-income households	

Additional Potential Market Barriers for Low Income Households	Supporting Data
Lower educational levels - faced by disproportionate number of low-income households	1990 Census Data
Mistrust of utilities - due to threat of shut-off	

*Note that these three potential market barriers are from the "Potential Residential Market Barriers" list.

ENERGY BURDEN: THE COST OF ELECTRICITY IN NEW HAMPSHIRE AS A PERCENTAGE OF INCOME

The typical monthly electric bill for a PSNH general use customer who uses 500 kWh per month is approximately \$74.¹⁵ The electric bill for a customer with electric space heat who uses a total of 1000 kWh per month for both general usage and space heat¹⁶ is approximately \$146 per month.¹⁷

A median income PSNH customer with an annual income of \$40,000 and an annual electric bill of \$900 (\$74/mo.) for general usage pays 2.3% of household income for electricity ($900 / 40,000 = .023$). In contrast, a low income PSNH customer whose sole source of income is \$6,000 per year in SSI disability benefits and whose annual electric bill is \$900 (\$74/mo) for general usage pays 15% of household income for electricity ($900 / 6,000 = .15$).

Similarly, a median income PSNH customer with an annual electric bill of \$ 1750 (\$ 146 mo. x 12) for both space heat and general usage would pay 4.4% of household income for electricity ($1750 / 40,000 = .0437$). In contrast, a low income PSNH customer whose annual electric bill is \$1750 (\$146/mo.) for both space heat and general usage would pay 29.2% of household income for electricity ($1750 / 6,000 = .2916$).

If the above example is applied to a low income household of four whose annual income is at 100% of the federal poverty level (\$16,500 in 1998) that family will pay 10.6 percent of household income for electric space heat and general usage ($1750 / 16,500 = .106$) as compared to the 4.4% of income paid by the median income customer.

¹⁵ Source: PSNH Standard Rate D, Tariff NHPUC 38 (June 2, 1998)

¹⁶ For purposes of this example and for ease of computations the usage figures have been made the same for all residential customers regardless of income level. However, usage data shows that on average, usage for low income electric space heat and general use is lower than for higher income residential customers.

¹⁷ Electric water heating is not included

In a 1992 study it was found that nationally low income households spent an average of \$105 per month in energy costs. The study pointed out that this represents over 20% of income for a family of 3 on AFDC with a total AFDC grant of \$516 per month. (Source: Energy and the Poor: The Crisis Continues, Margot Freeman Saunders and Maggie Spade, NCLC, Tables 11, 12, 15, January 1995).

CENSUS DATA: POVERTY IN NEW HAMPSHIRE

An estimated 8.6 percent of persons in New Hampshire were below the federal poverty level in 1993. This contrasts with 6.4 percent in 1990. The following information is from U.S. Census data.

1990

(for 1989)	Number of persons below poverty level	Percent below poverty
• Total number of persons (1)	69,104	6.4
• Persons 65 and over (1)	11,900	10.2
• Children under 5 (2)	7,106	8.5
• Number of households with income under \$5000 (3)	13,747 households	

1993

1993 Census Update Estimates:
Poverty in NH (1992)

• Total number of persons (4)	97,373	8.6
• Persons under 18 (5)	34,116	11.5
• Children ages 5 to 17 (6)	20,745	9.8
• Children under 5 (7)	11,747	14.4

Source: U.S. Census Bureau

- (1) Table 33A; Table P118
- (2) Table 33B
- (3) Tables P80, P107, P110
- (4) Table A 93-33

- (5) Table D 93-33
- (6) Table B 93-33
- (7) Table E 93-00

The Center on Budget and Policy Priorities reports that an analysis of 1996 Census data shows that the number and percentage of persons living in poverty failed to go down in 1996 despite the growth in the economy and a drop in the unemployment rate. The census figures show that the poverty level remains above 13 percent nationally. (Source: Center on Budget and Policy Priorities, October 14, 1997).

1998 FEDERAL POVERTY GUIDELINES

The federal poverty guidelines are the federal government's statistical poverty thresholds. They are also used by the Bureau of the Census to prepare its statistical estimates of the number of persons and families in poverty. The poverty guidelines are also used to determine financial eligibility for assistance or services under various federal public benefits programs. The federal poverty guidelines are set annually by the U.S. Department of Health and Human Services. The 1998 federal poverty guidelines are displayed in the chart below.

Household size	Poverty Guideline amount
1	\$ 8,050
2	10,850
3	13,650
4	16,450
5	19,250
6	22,050
7	24,850
8	27,650

Source: Federal Register, Vol. 63, No. 36, Feb. 24, 1998.

Attached is a chart which shows poverty levels by family size at 50%, 75%, 100%, 125%, and 150% of the federal poverty level. (Source: 1996 Annual Report of the Community Action Program Executive Director's Association, page 39.)

What income defines poverty?

Federal Poverty Income Standards
1996-1997

% of Poverty (By Family Size) -1998

100% FPL	Family Size	50%	75%	100%	125%	150%
\$ 8,050=\$671 per mo.	1	\$ 3,870	\$ 5,805	\$ 7,740	\$ 9,675	\$11,610
\$10,850	2	\$ 5,180	\$ 7,770	\$10,360	\$12,950	\$15,540
\$13,650	3	\$ 6,490	\$ 9,735	\$12,980	\$16,225	\$19,470
\$16,450	4	\$ 7,800	\$11,700	\$15,600	\$19,500	\$23,400
\$19,250	5	\$ 9,110	\$13,665	\$18,220	\$22,775	\$27,330
\$22,050	6	\$10,420	\$15,630	\$20,840	\$26,050	\$31,260
\$24,850	7	\$11,730	\$17,595	\$23,460	\$29,325	\$35,190
\$27,650	8	\$13,040	\$19,560	\$26,080	\$32,600	\$39,120
Add \$2,800	For each additional family member, add:	\$1,310	\$1,965	\$2,620	\$3,275	\$3,930

Source: Office of Management and Budget

Note: Historically, the majority of the poor were "the helpless", those unable to participate in the workforce -- children, elderly, and disabled. Families were larger as well.

In the 1980's a new profile emerged of poverty in New Hampshire:

- The poor in New Hampshire are: 1. The elderly living on inadequate fixed incomes; 2. Families thrown into short-term poverty by dissolution of the household; and 3. People who work as often and as hard as possible yet never get sustaining wages adequate to lift them to a state of consistent independence.
- The size of poor families is no greater than non-poor families.

A New Hampshire family of 4 with one member working 40 hours a week needs a wage of \$7.50 per hour to be at 100% of the Federal Poverty Guidelines (FPG).

STATE AND FEDERAL ASSISTANCE IN NEW HAMPSHIRE

Over 28,000 poor households receive public assistance in New Hampshire. Approximately, 17,000 households receive food stamps. The following chart lists the state and federal public assistance programs in New Hampshire and the number of recipient households in 1998.

Program: 1998	Households	Persons
Temporary Assistance to Needy Families (TANF)	6,000	
Aid to the Permanently and Totally Disabled (APTD)	7,800	
Old Age Assistance (OAA)	3,300	
Aid to the Needy Blind (ANB)	300	
Supplemental Security Income (SSI)	11,000 (as of 12/96)	
Food Stamps	17,000	36,000

Sources:
 N.H. Division of Human Services
 Social Security Administration

Maximum monthly grant levels for state and federal public assistance programs are significantly lower than the federal poverty levels. For example, the grant level for Supplemental Security Income for the aged, blind and disabled is only 74% of the federal poverty level (FPL). The attached chart shows the state and federal public assistance grant levels as a percentage of the FPL.

STATE AND FEDERAL PUBLIC ASSISTANCE GRANT LEVELS
AS A PERCENTAGE OF THE FPL

Program	Household Size	Monthly Grant	100% FPL (monthly)	100% FPL (annual)	Percent of FPL
TANF	1	\$414	\$ 671	\$ 8,050	62%
	2	\$481	\$ 904	\$10,850	53%
	3	\$550	\$1,137	\$13,650	48%
	4	\$613	\$1,371	\$16,450	45%
	5	\$673	\$1,604	\$19,250	42%
Adult Programs:					
• APTD					
• OAA					
• ANB					
	1	\$508	\$671	\$ 8,050	76%
	2	\$742	\$904	\$10,850	82%
• SSI	1	\$494	\$671	\$ 8,050	74%
	2	\$741	\$904	\$10,850	82%

COST OF LIVING IN NEW HAMPSHIRE

A study conducted for the New Hampshire legislature in 1991 found what many low income families already knew first hand -- it costs a working family of four at least \$26,000 a year to live in New Hampshire at a minimum level of adequacy.

In 1991 the legislature commissioned a study as part of Senate Bill 153 to determine the amount of money it would take to bring up children in a poor family to a level that would allow them to subsist at a minimum level of adequacy, or in the words of the legislation, "compatibly with decency and health." (Source: Report On Cost Of Living And AFDC Need And Payment Standard Options, July 1991, page 2).

Attached is a chart from the Cost Of Living Study showing the results of the research. The chart sets out a minimally adequate monthly budget for a four person family in New Hampshire by budget component. The 1991 minimum budgets range from an average of \$1,600 per month for a family of four with no employed adult in the home to almost \$2,400 per month for a family of four with a full time employed adult in the household. The shelter/utilities expense component of the budget ranges from \$626 to \$715 per month. (Source: Cost Of Living Study, July 1991, page 11, Exhibit 2-2.)

Appendix 5C – Part II

**REPORT ON COST OF LIVING AND AFDC NEED AND
PAYMENT STANDARD OPTIONS**

(July 1991)

Prepared for:

The State of New Hampshire
Committee for SB 153

Prepared by:

Lawrence Neil Bailis, PhD
Center for Human Resources
Heller Graduate School
Brandeis University
Waltham, Massachusetts

and

Lynn Burbridge, PhD
Center for Research on Women
Wellesley College
Wellesley, Massachusetts

A62

Exhibit 2-2

MINIMALLY ADEQUATE MONTHLY BUDGET
FOR A FOUR-PERSON FAMILY IN NEW HAMPSHIRE BY COMPONENT

<u>ITEM</u>	<u>NOT EMPLOYED</u>		<u>EMPLOYED PARTTIME</u>		<u>EMPLOYED FULLTIME</u>	
	Low	High	Low	High	Low	High
Food	\$ 372	\$ 372	\$ 372	\$ 372	\$ 372	\$ 372
Housing/Utilities	\$ 626	\$ 715	\$ 626	\$ 715	\$ 626	\$ 715
Telephone	\$ 21	\$ 21	\$ 21	\$ 21	\$ 21	\$ 21
Clothing	\$ 113	\$ 152	\$ 113	\$ 152	\$ 113	\$ 152
Medical	\$ 141	\$ 215	\$ 141	\$ 215	\$ 141	\$ 215
Transportation	\$ 62	\$ 62	\$ 124	\$ 124	\$ 165	\$ 165
Child Care	---	---	\$ 134	\$ 335	\$ 200	\$ 500
Other Expenses	\$ 160	\$ 160	\$ 192	\$ 192	\$ 192	\$ 192
Subtotal	\$ 1,495	\$ 1,697	\$ 1,723	\$ 2,126	\$ 1,830	\$ 2,332
Retirement/ Taxes	---	---	\$ 314	\$ 387	\$ 333	\$ 425
Total Monthly	\$ 1,495	\$ 1,697	\$ 2,037	\$ 2,513	\$ 2,163	\$ 2,757
Annual Amount	\$17,940	\$20,364	\$24,444	\$30,156	\$25,956	\$33,084
Hourly Wage Equivalent	\$ 8.97	\$ 10.18	\$ 12.22	\$ 15.08	\$12.98	\$ 16.54

LACK OF AFFORDABILITY OF SHELTER

In 1997 the median rent in New Hampshire was \$606 per month, including utilities. (Source: New Hampshire Housing Finance Authority 1997 Residential Rental Cost Survey, page 1). According to the 1998 Residential Rental Cost Survey the median rent for a two bedroom unit in Concord is over \$750 per month. By contrast, the entire TANF grant for a family of four is \$613 per month. The shelter component of the TANF grant is only \$243. (Source: New Hampshire Division of Human Services Family Assistance Manual, SR 97-03 (2/97) Table B).

According to the National Low Income Housing Coalition families with the lowest incomes face the most critical affordability problems. More than half (54%) of extremely low income households paid more than 50% of income for housing costs (as did 44% of very low income home owners). (Source: Out Of Reach: Rental Housing At What Cost?, National Low Income Housing Coalition, October, 1998, page 1). Nationally, 38% of renters are unable to afford the Fair Market Rents, including utilities, set by the U.S. Department of Housing and Urban Development for a two bedroom unit. In New Hampshire the figure is 39%. (Source: Out Of Reach: Rental Housing At What Cost?, pages 6,7).

NEW HAMPSHIRE HOUSING STOCK: STATISTICS

Structural Characteristics: 1990

Tenure and Vacancy Status (all counties)

• All housing units		503,904
• Owner occupied	280,415	
• Renter occupied	130,771	
• Other	92,718	
• Vacant total		92,718
• Vacant for rent	17,589	
• Condominium housing units		24,015
• Owner occupied	14,306	
• Renter occupied	9,709	
• Mobile homes: owner occupied		25,275

Year Structure Built: All Units

• 1989 - March 1990	12,471
• 1985 - 88	75,194
• 1980 - 84	51,765
• 1970 - 79	103,476
• 1960 - 69	57,736
• 1950 - 59	41,061
• 1940 - 49	25,473
• 1939 or earlier	136,728
• Total	503,904

Source: Office of State Planning. Detailed Housing Characteristics. Table 66. Structural Characteristics: 1990. NH, page 90.

See also attached chart entitled Age of NH Housing Stock. 1996 Annual Report of Community Action Program Executive Director's Association, page 41. Source: 1990 Census.

Bibliography

Resource Materials on Market Barriers and Other Issues

Related to Low Income Energy Efficiency

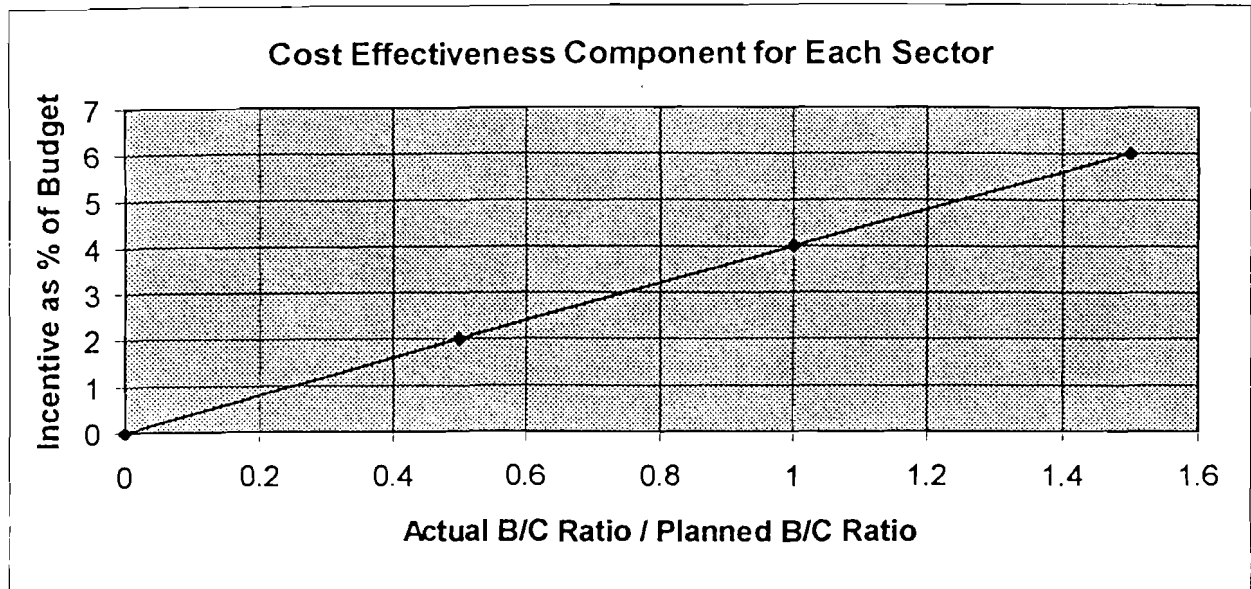
(in addition to Xenergy's bibliography)

1. *Utility Financed Low-Income Energy Conservation: Winning for Everyone*
Roger Colton
National consumer Law Center, April 1991
Market barriers: Section III.A., pages 30-41
2. Proposal for Decision: Investigation into the (Vermont) Department of Public Service's Proposed Energy Efficiency Plan (May 5, 1998)
3. *A Guide to Low Income Energy Efficiency*
Roger Colton and Nancy Brockway
National Consumer Law Center, 1996
Market barriers: Ch. 14: pages 65-69; Ch. 29: pages 166-167
4. *An Integrated Approach to Low-Income Energy Affordability For A Restructured World*

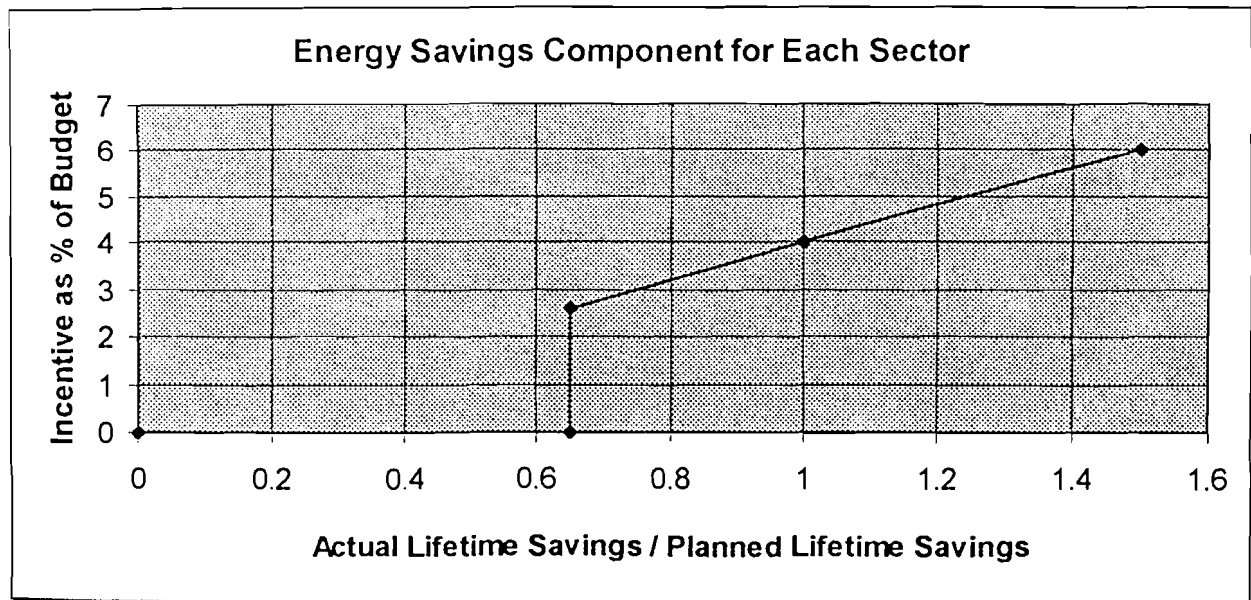
Blair Hamilton, David Carroll, Ben Adams, Susan Ringhof (DATE?)

5. *Low-Income Energy Policy in a Restructured Electric Industry: An Assessment of Federal Options*
Lester Baxter
Oak Ridge National Laboratory, July 1997.
6. *Process and Impact Evaluation of New England Power Service Company's Appliance Management Program. Volume I.*
Submitted to New England Power Service Company by Research Into Action and Essential Economics, Inc., July 10, 1998
7. *Perspectives on a Low Income Electricity Conservation Program for Rhode Island Ratepayers*
Presented by NEES at the RI PUC, July 29, 1997
8. *Partnerships for Energy Efficiency: The NEES Companies and Community Agencies in Three States*
Laura McNaughton
DOE Regional Electric Utility Restructuring Conference, September 1, 1998

APPENDIX 6: Shareholder Incentive Component Graph & Calculation Example



*Note: No incentive for this component if actual B/C for sector is < 1.0



*Note: No incentive for this sector if actual lifetime savings is < 65% of planned savings.

**General Note: A utility can earn more than 6 % on either the cost effectiveness or energy savings component of the incentive as long as the total incentive for each sector does not exceed 12% of that sector's planned budget.

