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# **The Cape Light Compact Energy Efficiency Plan**

**Providing Comprehensive Energy Efficiency Services  
to Cape Cod and Martha's Vineyard  
Through Municipal Aggregation**

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**November 29, 2000**

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The analysis, proposals and recommendations in this report are the sole responsibility of the authors.

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# 1. Introduction and Executive Summary

## The Cape Light Compact Energy Efficiency Plan

With the passage of the Massachusetts Electric Utility Restructuring Act of 1997, the electricity industry and energy efficiency market have entered a new era. Greater emphasis has been placed on market transformation and overcoming the market barriers that inhibit the delivery of efficiency services. The legislation included specific customer charges to fund concerted efforts to achieve these goals. The legislation also recognized the important role municipalities can play in aggregating customers to improve their ability to participate in the competitive generation market, and in designing and delivering energy efficiency programs.

The restructuring law allows municipalities that aggregate electricity customers to: (1) formulate an Energy Efficiency Plan, (2) submit the plan to town meetings for approval, (3) submit the plan to the Massachusetts Department of Telecommunications and Energy (the Department) for review and certification; and (4) recover the energy efficiency funds raised from consumers for use in implementing local energy efficiency programs. The Cape Light Compact, as the municipal aggregator of electricity customers for 21 towns on Cape Cod and Martha's Vineyard, has developed this Energy Efficiency Plan (EEP) in compliance with state law and consistent with state energy goals.

The Cape Light Compact was formed in 1997 following two years of study and votes of town meeting, boards of selectmen, and town council. It is organized through a formal intergovernmental agreement signed by the towns. The purpose of the Compact is to advance the interests of consumers in a competitive electric supply market, including the promotion of energy efficiency. Each participating municipality has a representative on the Compact Governing Board, which sets policy and works with technical and legal support to put the Compact programs in place.

The Compact is developing two programs: (1) the Community Choice Power Supply – which will provide competitively-price electricity to customers; and (2) the Compact's Energy Efficiency Program – which will use ratepayer funds in locally approved programs to promote efficient electricity use and reduce customer bills. In addition, the Compact is examining distributed generation options as part of an integrated distributed resources approach that would maximize long term benefits for consumers. Those benefits include premium power, peak-shaving, and improvements in reliability. Energy efficiency, of course, is a key piece of a distributed resources approach.

This Energy Efficiency Plan is the platform for the Compact's efficiency program. It outlines a program that builds upon the success and experience of energy efficiency providers in the region, and anticipates working closely with industry professionals and regional entities to advance state goals and provide many benefits to individuals and communities.

The programs included in this EEP are designed to advance consumer awareness and participation. The programs support regional efforts and streamlining of energy

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efficiency initiatives though work with the Northeast Energy Efficiency Partnership (NEEP), trade allies, efficiency vendors, and electric utilities. As described in the EEP, the Compact's extensive local networks and its structure provide increased opportunities for public education and market support. Through these extensive local networks the Energy Efficiency Plan also offers enhanced points-of-contact for consumers, especially for hard-to-reach consumers and trade allies. An example of this is how the Compact is currently utilizing parts of its network to increase awareness and participation in the low-income discount program.

The general goal of the EEP is to boost consumer awareness of and participation in energy efficiency activities – similar to what Cape and Vineyard communities have accomplished with their successful solid waste recycling initiative. To reach that goal, the Compact intends to develop one of the best packages of energy efficiency services and education in the Northeast. Energy efficiency initiatives at the community level present opportunities for extensive local involvement, and help develop an energy efficiency ethic that can support market transformation beyond the implementation of individual technologies or practices, resulting in long-term, sustained energy efficiency savings.

The Compact's Energy Efficiency Plan has two phases. Phase I, which is outlined in this document, builds upon approved programs currently in use in Massachusetts and the region. Phase I also includes the provision of education regarding peak-shaving opportunities. Phase II will examine the potential for new innovations based upon suggestions and review of proposals by efficiency experts, trade allies, energy service companies, consumer representatives, and local officials. It will include examination of programs that have proven successful for communities elsewhere in the nation. Phase II programs will be coupled with anticipated distributed generation pilot programs, as a part of the distributed resources approach used by the Compact. Phase II programs will also seek to obtain additional sources of funding – from communities, from energy service companies, from state and federal grants, and from participating customers – in order to enhance activities in the short-term and continue certain energy efficiency programs beyond 2002.

## **General Timeline**

The general timeline for approval and implementation of the Compact's Aggregation Plan and Energy Efficiency Plan is as follows:

- The Compact has received approval from the Department of Telecommunications and Energy (DTE) for its customer Aggregation Plan in August 2000.
- Nineteen of the 21 towns within the Compact have already approved this Energy Efficiency Plan at town meetings. The remaining two towns are expected to approve this EEP at upcoming town meetings in the spring of 2001.
- The Compact submits this Energy Efficiency Plan to the DTE in November 2000.
- The DTE reviews and certifies the EEP by the first quarter of 2001.

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- The Compact's Management Contractor is selected and contract finalized during the fourth quarter of 2000.
  - The Management Contractor develops the necessary administrative infrastructure and begins the marketing campaign in the first and second quarters of 2001.
  - The Compact works with Commonwealth Electric in the first and second quarters of 2001 and beyond to ensure a smooth transition of programs.
  - The Compact begins delivering energy efficiency services on July 1, 2001.
  - Programs continue at least through the end of 2002. If the Legislature approves additional ratepayer funding for energy efficiency programs, then the Compact programs will continue after 2002.

### **Administration and Management**

The Compact will work with professionals in the energy field to manage and deliver energy efficiency services. Section 2.2 includes a description of the organizational structure, and outlines the allocation of administration and management responsibilities. Consumers and town governments possess local authority over the program. Policy, contract, budget, and other oversight of the program are provided by town representatives on the Compact Governing Board. Fiscal management and administrative support are provided by Barnstable County. Day-to-day management of the program and vendors will be carried out by a Management Contractor, selected from experienced professionals in the energy efficiency field. Finally, vendors hired through a competitive bidding process will deliver energy efficiency products and services to customers.

### **Overview of Energy Efficiency Programs**

The Compact's programs are designed to comply with state energy efficiency goals and policies. In general, the programs are structured according to customer types, as well as the types of electricity end-uses utilized by customers. In this way, the marketing and delivery of the programs can address the unique interests and market barriers of each customer type, as well as the unique opportunities and challenges of each end-use type.

The programs are broadly divided into those for residential customers and those for commercial and industrial customers. In addition, there is a core Public Education and Marketing Program that underlies the delivery of each of these two main programs.

The Energy Efficiency Plan includes the following programs:

- The Residential New Construction Program, which provides home buyers, home builders, and construction trade allies with incentives to increase the home energy rating of homes that are newly built or undergo major renovations.
- The Residential Products and Services Program, which seeks to increase the availability and use of efficient lighting, clothes washers, water heaters, air

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conditioners, and refrigerators. This program is used to implement NEEP and other regional market transformation initiatives.

- The Residential High-Use Customers Program, which provides residential customers using electric space heating with incentives to improve the efficiency of their electric measures or to switch to efficient measures that use alternative fuels.
- The Low-Income Single Family Program, which provides low-income customers in single-family dwellings with assistance in purchasing and installing efficient lighting, appliances, and space heating measures.
- The Low-Income Multi-Family Program, which provides owners and managers of low-income multi-family dwellings with assistance in purchasing and installing efficient lighting, appliances and space heating measures.
- The Low-Income New Construction Program, which provides low-income housing development agencies, weatherization assistance program (WAP) providers, and residential construction trade allies with incentives to increase the home energy rating of new low-income housing.
- The Commercial and Industrial New Construction Program, which provides incentives to increase the efficiency in the construction, renovation, or remodeling of all commercial, industrial, government and multi-family housing facilities.
- The Medium and Large Commercial and Industrial Retrofit Program, which provides technical and financial assistance to medium and large C/I customers seeking to replace existing equipment and processes in their facilities with high-efficiency alternatives.
- The Small Commercial and Industrial Retrofit Program, which provides incentives to C/I customers whose peak demands are less than 100 kW to replace existing equipment with high-efficiency equipment.
- The Commercial and Industrial Products and Services Program, which seeks to increase the availability and use more efficient motors, lighting designs, and HVAC systems. This program is used to implement NEEP and other regional market transformation initiatives.
- The Government Agencies Program, which provides technical and financial energy efficiency assistance to all government facilities, including municipal, state and federal facilities.

The Public Education and Marketing Program is designed to utilize the extensive network and opportunities that the Compact has at the community and local government level. Public education and market support are designed to help overcome common barriers of awareness and knowledge and facilitate program participation. The energy efficiency public education program will be coordinated with a separate, but related education program on distributed generation, in order to assure integration of clear and consistent messages regarding demand-side and supply-side distributed resources.

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## **Summary**

The Compact's Energy Efficiency Plan offer advantages of a highly-informed, on-the-ground approach to energy production and use. It provides a well-balanced, comprehensive and cooperative approach to the development and implementation of energy efficiency. It builds upon successful programs developed in Massachusetts, and outlines new opportunities to enhance education, marketing and program participation in a broader distributed resources framework. It assures the active engagement of consumers in the program, and the return of consumer funds for use at the local level. It meets state energy goals and requirements, and it offers an important effort to build an ethic for energy efficiency that can be vital to market transformation.

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## 2. Summary of Key Plan Components

### 2.1 Background on the Cape Light Compact

The Cape Light Compact was formed in 1997 following two years of study and discussion. It is a consumer-based organization authorized by votes of town meeting, boards of selectmen, town council, and county commissioners. It consists of 21 towns in Barnstable and Dukes counties. This includes all of the towns on Cape Cod and Martha's Vineyard.

The Compact's articles of organization comprise a formal Intergovernmental Agreement signed by each participating town or county member. Membership provides voting rights and inclusion for planning, analysis, and participation in Compact programs. The organization relies on the existing structure of local and county government, cooperation between government agencies, and the professional expertise provided by contractors.

The purpose of the organization is to advance the interests of consumers in a competitive electric power supply market. This purpose includes development and implementation of plans for energy efficiency.

The Compact's goals stated in the Intergovernmental Agreement describe the organization's purpose:

- To provide the basis for aggregation of all consumers on a non-discriminatory basis;
- To acquire the best market rate for electricity supply and transparent pricing;
- To provide equal sharing of economic savings based on current electric rates and/or cost-of-service rate-making approved by the Department of Telecommunications and Energy;
- To provide and enhance consumer protection and options for service under contract provision and to allow those consumers who choose not to participate to opt-out;
- To improve quality of service and reliability;
- To encourage environmental protection through contract provisions;
- To utilize and encourage renewable energy development to the extent practicable through contract provisions, demonstration projects and state mandated system benefit charges for renewable energy;
- To utilize and encourage demand-side management and other forms of energy efficiency through contract provisions and state mandated system benefit charges for energy efficiency;
- To advance specific community goals that may be selected from time to time, such as placing utility wires underground;

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- To provide full public accountability to consumers; and
  - To utilize municipal and other powers and authorities that constitute basic consumer protection to achieve these goals.

In order to achieve its energy efficiency goals, the Compact has developed this Energy Efficiency Plan. It has also included provisions in its request for proposals (RFP) and power supply contract for its competitive power suppliers to participate and cooperate with the energy efficiency, demand-side management, and distributed resources efforts. The EEP also includes peak shaving efforts that would manage consumption and usage of electricity for individual customers participating in the programs, and improve the general load characteristics of the aggregated group – thus creating opportunities over the long term for better power supply prices, for increased reliability, and for premium power supply.

The Restructuring Act allows customers to “opt-out” of the generation program offered by municipal aggregators if they can find preferable generation services and prices from the competitive marketplace. Consequently, some customers may choose to opt-out of the Compact’s Community Choice Power Supply program. The Compact will continue to provide energy efficiency services to any such opt-out customers, and receive and utilize the energy efficiency revenues generated by such customers. This approach is consistent with how customers receiving competitive supply currently participate in energy efficiency programs operated by ComElectric. The opt-out customers will be treated the same as all of the customers that choose to remain with the Compact’s Power Supply program.

## **2.2 Energy Efficiency Program Administration**

Figure 2.1 depicts the organizational and decision-making structure that will be used to administer the Compact’s energy efficiency programs. There will be five components to this organizational structure, addressing (1) overall goals, (2) detailed policy issues, (3) administration, (4) program management, and (5) service delivery. Each of these components is described below.

### Consumers/Town Members: Overall Goals

The consumers in each Compact member town have the opportunity at town meeting, or through town council to approve the Energy Efficiency Plan and to work with Boards of Selectmen, Town Council and town departments to guide the Compact Governing Board on plan adjustments over time. As final recipients of service and in their oversight and responsive role, and as part of the Compact’s local network, consumers, town departments, and social, civic and religious organizations in the member towns play an important part in the overall development and implementation of the EEP.

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### Compact Governing Board: Policy, Contract, Budget Oversight

The Compact Governing Board includes one representative from each member town, and provides on-going policy, contract, and budget oversight for the energy efficiency program. Some members of the Board have extensive utility and energy efficiency program experience. The Governing Board decisions are informed by input from the towns and consumers, legal and technical advisors, the program administrators, and reports and recommendations of the Energy Efficiency Subcommittee. The Governing Board provides guidance and instructions to the Barnstable County administrative personnel and the Compact Management Contractors. The Governing Board will also oversee and review the work of the Monitoring and Evaluation Contractor.

### Barnstable County Administrative Personnel: Fiscal Management and Administration

Barnstable County provides fiscal and administrative support services for the Compact. For fiscal matters this includes: (1) receipt of energy efficiency funds on behalf of the Compact; (2) accounting and disbursement; and (3) financial reporting.

For administrative support this includes issuance of RFPs, contract formation with bidders recommended by the Compact (consistent with requirements of state law), and professional staff for oversight of the Compact Management Contractor. The administrative staff will provide monthly updates on the program to the Governing Board. The administrative staff may also address specific program issues with legal and technical support and the Compact's Energy Efficiency Subcommittee. An independent auditor will also be engaged to conduct an annual financial audit of all program funds and disbursements.

### Compact Management Contractor: Day-to-Day Program Management

The Compact Management Contractor will include a team of experienced professionals that conduct day-to-day management of the energy efficiency programs. The Management Contractor will have the primary responsibility for ensuring that the programs are delivered as planned, in an effective and efficient manner. The Management Contractor will assist the Compact in conducting competitive bidding processes to select vendors and review and recommend vendor claims for payment to the Compact. The Management Contractor will oversee the work of all the program vendors, provide guidance on program design, and ensure quality performance from each vendor.

The Management Contractor will provide a single point of contact for all entities involved in implementing the efficiency programs, including the customers, the trade allies, other utilities, NEEP and other energy efficiency organizations. Furthermore, the Management Contractor will be in regular contact with the Compact staff, provide monthly updates on the program, and quarterly presentations to the Compact Governing Board. The Management Contractor will also have the responsibility for ensuring that the budget for each efficiency program is adhered to.

The Management Contractor will be hired through a competitive bidding process. The Compact issued a request for proposals in March 1999, and received three responsive

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proposals from highly qualified companies. The Compact will finalize the Management Contractor selection process and implement a contract for the Management Contractor services during the fourth quarter of 2000.

The Vendors: Service Delivery

The vendors will deliver the energy efficiency services and products to participating customers, as outlined in the descriptions below for each energy efficiency program. These services will include marketing and outreach, providing energy audits and offering technical assistance, installing efficiency measures, customer education, working with trade allies to increase the availability of efficiency products and services, and other services that may be required of each program.

A separate contractor will be hired to conduct the monitoring and evaluation of the Compact's energy efficiency programs, because of the unique areas of expertise required for this purpose. This contractor's work will be overseen by the Compact Governing Board.

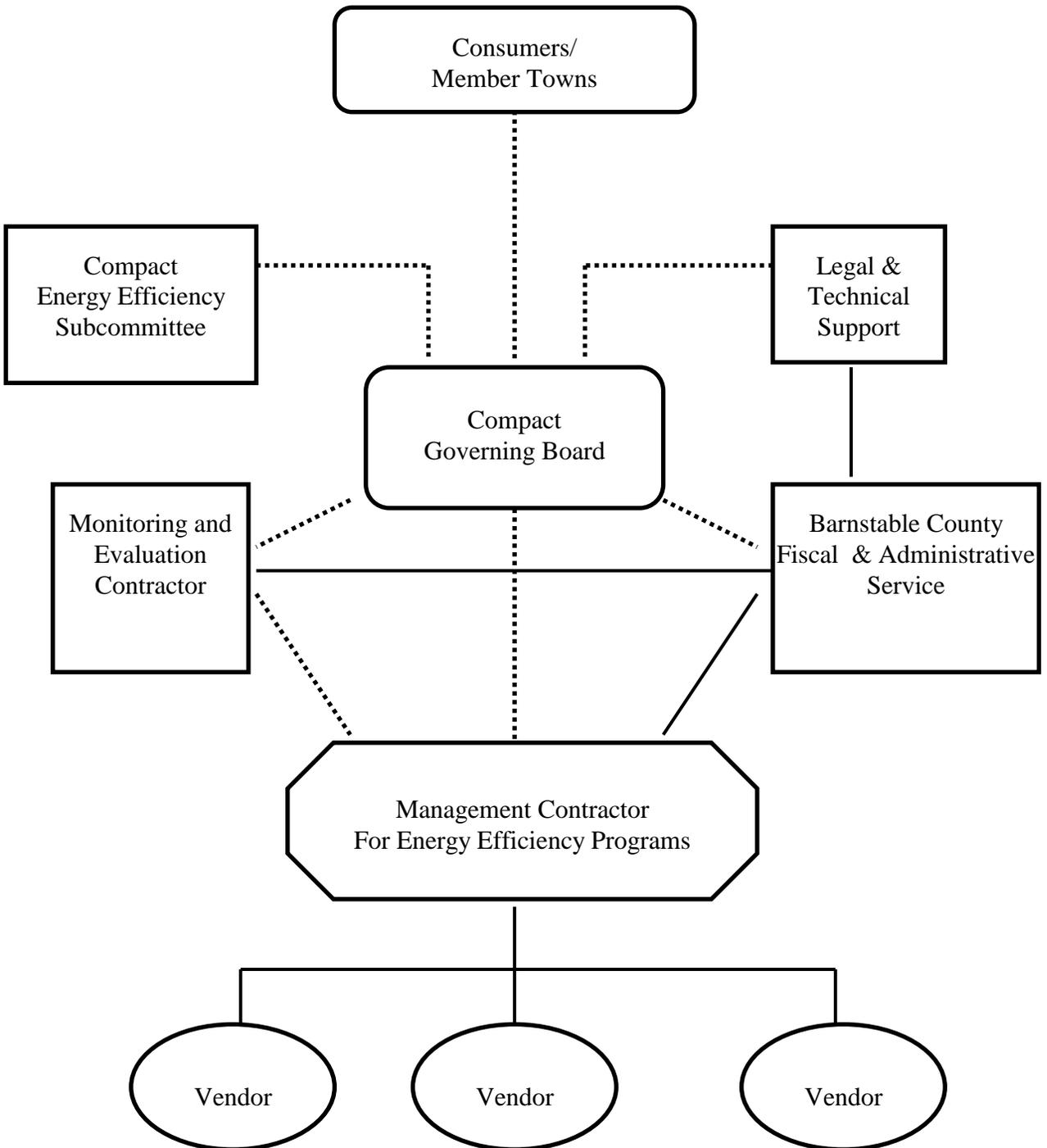
The efficiency service vendors will be hired, directed and managed by the Program Management Contractor, acting on instruction of the Compact Governing Board. The vendors will be hired through a competitive bidding process.

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**Figure 2.1 Structure of Energy Efficiency Program Administration**

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A dashed line indicates communication and policy guidance.  
A solid line indicates direct supervision and contract oversight.



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## **2.3 Overview of Energy Efficiency Programs**

### **Consistency With Other Programs Offered by Electric Utilities**

The Compact is committed to delivering energy efficiency programs that are consistent with the programs being provided by Massachusetts utilities. Consistency of program designs across service territories will minimize customer confusion, facilitate market transformation, and maximize the benefits available from energy efficiency initiatives.

The Compact's energy efficiency program designs are based upon the programs currently being offered by electric utilities in Massachusetts and the region. In this way, the Compact's programs enjoy the benefits of the experience gained and lessons learned by electric utilities in the past. In addition, since the Massachusetts utility programs have been designed with the assistance of many stakeholders through collaborative processes, the Compact programs indirectly enjoy the benefits of the input from these stakeholders.

The Compact will join the Northeast Energy Efficiency Partnership, and has included NEEP initiatives among its energy efficiency programs. The NEEP initiatives are sponsored by a number of utilities in the region. One of NEEP's primary objectives is to coordinate energy efficiency efforts across many utilities, trade allies and energy efficiency providers. This coordination is expected to reduce the costs of program delivery, provide consistent marketing materials and financial incentives, minimize customer and trade ally confusion and market barriers, and transform the market for energy efficiency products and services. The Compact looks forward to participating as a stakeholder in the NEEP process to stay abreast of and contribute to national and regional market transformation efforts.

The Compact plans to implement the Residential New Construction Program that has been developed by electric utilities in the region. To the extent appropriate, the Compact will coordinate program design and delivery efforts with those of other utilities in the region, including the efforts of Commonwealth Electric Company.

The Compact also plans to implement the Residential Low-Income programs that have been developed by the Massachusetts Low-Income Energy Affordability Network (LEAN), and are being implemented by distribution companies in Massachusetts. We intend to work closely with LEAN over time to ensure consistent program delivery and to maximize the benefits of the programs.

The Compact will also draw upon, and create alliances with, the various regional and national efforts to promote transformation in the energy efficiency market. For example, we will work with the various programs and initiatives sponsored by the Consortium for Energy Efficiency as well as the US Department of Energy's ENERGY STAR program.

### **Structure of Energy Efficiency Programs**

In general, the Compact's programs are designed to overcome the many market barriers that prevent customers from adopting cost-effective energy efficiency measures. The programs are structured according to customer types, such as residential, low-income,

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small commercial/industrial (C/I), large C/I, government agencies, etc. The programs are also structured according to the types of electricity end-uses utilized by customers, for example by addressing high-use residential customers separately from other residential customers. Furthermore, the programs are structured to take advantage of critical opportunities and decision points regarding electricity consumption, with programs targeted to addressing new construction in the residential and commercial sectors. By structuring the programs in this way, the marketing and delivery of the programs can be designed to take account of the unique interests and needs of each customer type, and can be most effective in overcoming market barriers to energy efficiency.

Residential customers face many market barriers to energy efficiency, including: high transaction costs, lack of awareness of efficiency measures, lack of awareness of efficiency benefits, limited access to financing, uncertainty about the performance of new and different measures, limited product or service availability, lack of financial incentive for landlords that do not pay electricity bills, and lack of ability of tenants to install efficiency measures in rented buildings.

Commercial and industrial customers face many of the same barriers as residential customers, and sometimes have additional barriers, including: lack of supply-chain and distribution support, spending budgets that limit up-front investments, budgeting systems that offer no incentive to reduce electricity bills, and lack of procedures, staff or funding to evaluate energy consumption and energy efficiency opportunities.

The Compact's programs are broadly divided into those for residential customers, low-income customers, and commercial and industrial customers. In addition, there is a core Public Education and Marketing Program that underlies the delivery of each of these three main program types.

The Public Education and Marketing Program is designed to utilize the extensive network and opportunities that the Compact has at the community and local government level to advance existing and emerging energy efficiency services, technologies, and practices. The general goal of the Compact will be to build an ethic for energy efficiency in the Cape and Vineyard communities similar to the ethic for recycling of solid waste. This efficiency ethic can serve as an important component to support market transformation beyond the implementation of specific technologies or practices.

The Compact's local network provides new and enhanced points of contact and opportunities for access to the general population or target groups, including hard-to-reach segments of the community. It also offers the credibility and trust of a regional non-profit effort and increased opportunities for feedback from consumers that can inform adjustments or revisions to programs on a timely basis.

The Compact will carry out its public education and marketing efforts through two interrelated programs. The Public Education Program will carry on a multi-layered activity to provide broad awareness of the benefits of efficient energy use. The Marketing Program will support and enhance traditional marketing efforts engaged in by vendors and trade allies.

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The Compact will track the energy efficiency expenditures that are made in each town, and will seek to achieve an equitable distribution of the efficiency funds over time. In this way, the electric customers in each town will have the opportunity to receive benefits that are comparable to its contribution to the Compact's energy efficiency funds.

### **Introduction of the Compact's Programs**

The Compact will begin delivering energy efficiency services on July 1, 2001. Consequently, we have developed a budget that assumes a half-year program implementation in 2001. The budget is based on the assumption that the Compact will receive all of the energy efficiency funds generated by customers within its towns for one-half of 2001, and all of the funds in the following years.

Given the lead time necessary to begin program implementation, as well as the need to make a smooth transition from programs currently being delivered by Commonwealth Electric, we intend to begin marketing the programs and developing our administrative infrastructure during the first half of 2001. This approach will require utilizing a portion of the marketing and administrative budgets for 2001 during the first half of 2001.

The Compact will begin discussions with representatives of Commonwealth Electric to discuss the steps necessary to make the transition from their programs to ours. We intend to continue and expand upon our efforts to coordinate with Commonwealth Electric on transition issues, particularly once we receive approval from the DTE on our Energy Efficiency Plan. We will also continue with efforts to coordinate with the non-utility parties in the Commonwealth Electric energy efficiency collaborative process.

The Compact is currently in the process of evaluating candidates for a Management Contractor. We expect to make a decision on the Management Contractor soon, and to establish a conditional contract with the Management Contractor by the end of 2000. The Compact will also hire one full-time staff member to work with the Management Contractor and to coordinate the responsibilities of the Compact and the Management Contractor. Our goal is to have the administrative and staffing needs addressed as much as possible by the time we receive DTE approval of the EEP, so that we can immediately begin to receive funding, develop the administrative infrastructure, and ramp up the program marketing.

### **Equitable Distribution of Program Funds Across Towns**

The Compact plans to maintain an equitable distribution of program funds across each of its member towns. To the extent possible, each town will be encouraged to utilize the energy efficient funds that are generated by the electricity customers within its borders. A tracking system will be established to estimate the amount of funds generated by each town, as well as the amount of funds spent by each town over time. Those towns that are under-spending their budgets will be informed about the opportunities for increased efficiency spending, while those towns that attempt to overspend their budgets may be asked to postpone some efficiency investments until the other towns have had full opportunity to access their funds. For funds which are underutilized, the Compact

Governing Board has developed an equitable policy for fund transfer to uses in other towns, consistent with the EEP and cost effectiveness analysis. Provisions will be made to account for the unique conditions in each town, such as the number of low-income customers, the number of commercial or industrial customers, and the opportunities for energy efficiency investments in general.

## 2.4 Program Budgets

The program budgets were developed using both a "top-down" and a "bottom-up" approach. The top-down approach begins by determining the total amount of energy efficiency funds available, and allocating them to various programs based on the energy consumption of different customer classes. The bottom-up approach assumes a desired level of participation rates and customer incentive costs for each efficiency measure, adds in the marketing, administration, and implementation costs for each program, and then adds up all the costs of the programs. Iterations between the two approaches were used to reach a budget that includes an appropriate allocation of costs across customer classes.

Table 2.1 presents a summary of how the energy efficiency budgets were determined and allocated across customer classes. The forecast of electricity sales to Compact customers is applied to the energy efficiency charge to determine the amount of efficiency funds to be collected.<sup>1</sup> For 2001, the forecasted energy sales and budgets are for one-half year. For the second half of 2001 the total amount of efficiency funds collected from Compact customers will be \$2.5 million.

**Table 2.1 Compact Budget Summary**

<b>Forecasted Sales (MWh)</b>	<b>2001</b>	<b>2002</b>
Residential	500,483	1,019,892
<u>Commercial</u>	<u>433,254</u>	<u>882,891</u>
Total	933,737	1,902,783
Efficiency Charge (mills/kWh)	2.70	2.50
<b>Efficiency Collections (\$)</b>		
Residential	1,351,304	2,549,729
<u>Commercial</u>	<u>1,169,786</u>	<u>2,207,228</u>
Total	2,521,090	4,756,958
<b>Efficiency Allocations (\$)</b>		
Low-Income	233,434	475,696
Residential	873,033	1,915,608
Commercial	811,416	1,762,447
<u>IRM Set-Aside</u>	<u>603,207</u>	<u>603,207</u>
Total	2,521,090	4,756,958

A portion of the Compact's efficiency funds will be used to pay for the Compact customers' share of the Commonwealth Electric Company's committed Integrated Resource Management (IRM) payments. These payments equal roughly \$0.6 million for

<sup>1</sup> If the actual sales to Compact customers in 2001 are different than those estimated, the program budgets will be modified accordingly.

one-half of 2001, leaving a total of roughly \$1.9 million for the Compact's efficiency programs in the second half of 2001.

The budget for the low-income programs was determined by multiplying the 2001 electricity sales to Compact customers by 0.25 \$/MWh, according to the requirements of the Massachusetts restructuring law. We then allocated the remaining funds to the Compact's residential programs and commercial/industrial programs, based on these customer classes' share of electricity sales in 1999. The costs associated with the low-income programs were allocated to the residential and commercial/industrial classes according to the method prescribed by the DOER in its energy efficiency guidelines (DOER 1999). This allocation is detailed in Table 2.2, which includes data for one-half of the year 2001.

**Table 2.2 Contributions of Customer Classes to the Low-Income Budget in 2001**

<b>2001 Budget Items</b>	<b>Residential</b>	<b>Low-Income</b>	<b>C&amp;I</b>	<b>Total</b>
2001 MWh Sales	474,958	25,525	433,254	933,737
Percent of Total Sales	50.9%	2.7%	46.4%	100.0%
Total EE Budget	933,737,163 kWh, times	2.70	mills/kWh	2,521,090
Low-Income Budget	933,737,163 kWh, times	0.25	mills/kWh	233,434
EE Budget	1,196,352	233,434	1,091,304	2,521,090
Percent of Total Budget	47.5%	9.3%	43.3%	100.0%
<b>Contribution by Residential and C&amp;I Classes to Low-Income Class:</b>				
MWh Sales	474,958	0	433,254	908,213
Percent of Total Sales	52.3%	0.0%	47.7%	100.0%
<b>Low-Income Budget Above Propotional Allocation:</b>				
233,434	less	2.70	25,524,639	164,518
<b>Contribution by Class:</b>				
Residential	52.3%	times	164,518	86,036
Commercial & Industrial	47.7%	times	164,518	78,482

Table 2.3 presents the details of the Compact's efficiency budget, by program. The program costs are broken out by planning and administration, marketing, financial incentives to customers, program implementation, and evaluation and market research. The Compact does not require shareholder performance incentives, hence these are not included in the budget. The Compact does not have to true up any fund balances remaining from previous years, because 2001 will be the first year of program operation.

The Compact has set aside a maximum of \$250,000 to fund all of the Management Contractor's activities in 2001. These costs are included in the table above, and are categorized as program administration, program marketing and program implementation costs. The Management Contractor will be supported by one full-time Compact staff member dedicated to implementing the efficiency program. The Management Contractor will also be supported by the facilities and services (e.g., fiscal services) of the Compact and Barnstable County.

The budget for the low-income programs includes a fee to support LEAN in its on-going program design efforts. The budgets for programs including NEEP initiatives include the NEEP membership costs.

**Table 2.3 Detailed Program Budgets for 2001**

	Program Planning & Admin.	Program Marketing	Customer Incentives	Program Implement- ation	Evaluation & Market Research	Total
<b>Low-Income Programs</b>						
Low-Income Single Family	6,541	1,635	119,364	32,703	3,270	163,513
Low-Income Multi-Family	1,881	470	34,320	9,403	940	47,013
Low-Income New Construction	911	228	16,630	4,556	456	22,781
<b>Total Low-Income</b>	<b>9,332</b>	<b>2,333</b>	<b>170,314</b>	<b>46,661</b>	<b>4,666</b>	<b>233,307</b>
<b>Residential Programs</b>						
New Construction	8,370	14,648	138,108	41,851	6,278	209,254
Products and Services	13,143	23,001	216,862	65,716	9,857	328,579
High Use	7,565	13,238	226,018	37,824	5,674	290,318
<b>Total Residential</b>	<b>29,078</b>	<b>50,887</b>	<b>580,987</b>	<b>145,390</b>	<b>21,809</b>	<b>828,151</b>
Residential Plus Low-Income	38,410	53,220	751,301	192,051	26,475	1,061,457
<b>Commercial &amp; Industrial Programs</b>						
New Construction	9,287	2,322	178,776	34,827	6,965	232,177
Medium and Large Customers	5,013	1,253	96,496	18,798	3,760	125,320
Small Customers	10,676	2,669	205,511	40,035	8,007	266,897
Government Agencies	3,465	866	66,699	12,993	2,599	86,622
Products and Services	2,512	628	48,349	9,419	1,884	62,790
<b>Total Commercial &amp; Industrial</b>	<b>30,952</b>	<b>7,738</b>	<b>595,831</b>	<b>116,071</b>	<b>23,214</b>	<b>773,806</b>
<b>Total Program Costs</b>	<b>69,363</b>	<b>60,958</b>	<b>1,347,132</b>	<b>308,122</b>	<b>49,689</b>	<b>1,835,263</b>
Public Education & Marketing Campaign	0	57,500	0	0	0	57,500
Compact Technical Support	25,000	0	0	0	0	25,000
<b>Total Costs of Efficiency Plan</b>	<b>94,363</b>	<b>118,458</b>	<b>1,347,132</b>	<b>308,122</b>	<b>49,689</b>	<b>1,917,763</b>
<b>Set Aside for Com/Elec IRM</b>	----	----	----	----	----	603,207
<b>Total Efficiency Funds Collected</b>	----	----	----	----	----	<b>2,520,970</b>

Our budgets are designed to dedicate as much of the funding as possible toward the delivery of efficiency measures, the achievement of efficiency savings, and the transformation of the efficiency market – while also providing sufficient administrative support are to ensure efficient program operation and quality control. As the Compact gains experience with the marketing, delivery and administration of the energy efficiency programs, it may modify these budget assumptions slightly to achieve the best balance between the delivery of efficiency savings and the administration of the programs.

The 2002 program budget details will be developed once the Compact has gained some experience in delivering the programs in the year 2001. The budget details for 2002 will be very similar to those for 2001. The primary difference is that less funding will be available overall, because the energy efficiency charge to customers will be reduced to \$2.5/MWh. This reduction will be offset slightly by increased sales, leading to total efficiency funds of nearly \$4.8 million.

## 2.5 Program Cost-Effectiveness Analysis

### Cost-Effectiveness Methodology and Assumptions

The cost-effectiveness of the Compact's programs is demonstrated using two tests, the Total Resource Cost (TRC) test, and the Energy System test. The Energy System test includes benefits and costs associated with producing energy (primarily electricity), and is designed to indicate the costs and benefits of energy efficiency programs from the perspective of electricity customers as a group. The TRC test includes benefits and costs associated with program participants as well as those associated with the energy system. The main components of the two tests are summarized in Table 2.4 below.

**Table 2.4 Components of the Energy System and Societal Cost Tests.**

	Total Resource Cost Test	Energy System Test
<b>Energy Efficiency Program Benefits:</b>		
Avoided Generation Costs	X	X
Avoided Transmission and Distribution Costs	X	X
Avoided Environmental Compliance Costs	X	X
Avoided Costs of Serving Low-Income Customers	X	X
Participating Customer Resource Benefits (e.g. oil, gas, water)	X	---
Participating Customer Non-Resource Benefits (e.g. O&M savings)	X	---
Environmental Benefits	---	---
Economic Benefits	---	---
<b>Energy Efficiency Program Costs:</b>		
Program Administrator Costs	X	X
Program Administrator Incentives (if applicable)	X	X
Participating Customer Costs	X	---

In DTE 98-100 the Department required energy efficiency program administrators to use the TRC test for determining energy efficiency program cost-effectiveness. Here we present the results of both tests, because they both provide important information regarding the benefits of these programs.

In fact, the Compact believes that both the TRC test and the Energy System test understate the true value of energy efficiency programs. The Societal test is the best standard for determining the cost-effectiveness of energy efficiency programs. This test includes impacts on society in general, in addition to the impacts on participating customers and the energy system. The Societal test accounts for the environmental and economic benefits of energy efficiency programs. As a municipal aggregator, representing the citizen's of 21 towns, the Compact places a high value on environmental preservation and economic development. We believe that the environmental and economic benefits of energy efficiency programs are significant, and that the Compact's energy efficiency programs are substantially more cost-effective than is indicated by either the Total Resource test or the Energy System test. Furthermore, to the extent that

energy efficiency programs can improve the Compact customers' load factor, there will be additional long-term benefits as a result of reduced power supply costs.

The assumptions used in our cost-effectiveness analysis are consistent with those used in the NSTAR 2000 energy efficiency plan. In many cases, the assumptions of savings and costs of efficiency measures are taken from the NSTAR program screening analysis. The avoided costs are taken from the study prepared for the Massachusetts utilities in July 1999, entitled *Avoided Energy-Supply Costs for Demand-Side Management Screening in Massachusetts*.

Market transformation programs create new challenges in measuring program cost-effectiveness. It is difficult to estimate the extent to which energy efficiency measures will be adopted beyond the program participants but as a consequence of the program. Market transformation programs can also have impacts that go beyond the Compact's service territory, or that take many years to achieve but create long-term effects. The estimates above do not include the benefits of these "market effects." Consequently, our analysis is likely to understate the full amount of energy savings associated with these programs. Our market effect assumptions will be updated in the future as regional and national efforts to implement and measure market transformation programs improve.

## Cost-Effectiveness Results

The results of our cost-effectiveness analyses are summarized in Tables 2.5 and 2.6. The costs and benefits are presented as 1998 present value dollars. Program costs include the first one and one-half years of operation, while program benefits include the energy savings that occur over the lifetime of the efficiency measures.

**Table 2.5 Cost-Effectiveness Results: Total Resource Cost Test.**

	Cumulative Program Costs (\$1000)	Cumulative Program Benefits (\$1000)	Net Benefits (\$1000)	Benefit- Cost Ratio
<b>Low-Income Programs</b>				
Single Family	425	1,390	965	3.3
Multi-Family	122	423	300	3.5
New Construction	59	100	41	1.7
<u>Total Low-Income</u>	<u>606</u>	<u>1,913</u>	<u>1,306</u>	<u>3.2</u>
<b>Residential Programs</b>				
New Construction	691	1,432	741	2.1
Products and Services	2,739	3,790	1,052	1.4
High Use	975	1,016	41	1.0
<u>Total Residential</u>	<u>4,405</u>	<u>6,238</u>	<u>1,834</u>	<u>1.4</u>
<b>Commercial &amp; Industrial Programs</b>				
New Construction	657	793	135	1.2
Medium and Large Customers	576	991	415	1.7
Small Customers	773	2,008	1,235	2.6
Government Agencies	361	543	181	1.5
Products and Services	212	303	91	1.4
<u>Total Commercial &amp; Industrial</u>	<u>2,581</u>	<u>4,638</u>	<u>2,058</u>	<u>1.8</u>
<b>Total Programs</b>	<b>7,591</b>	<b>12,789</b>	<b>5,198</b>	<b>1.7</b>

As indicated in Table 2.5, all of the Compact's energy efficiency programs are cost-effective from the Total Resource Cost perspective. On average, all of the Compact's energy efficiency programs combined are estimated to have a benefit-cost ratio of 1.7 from the TRC perspective.

As indicated in Table 2.6, most of the Compact's energy efficiency programs are also cost-effective from the Electric System perspective. The Low-Income New Construction and the Residential New Construction Programs have benefit-cost ratios of less than one, when only electricity savings are included. However, these programs provide low-income benefits and customer resource benefits that make them highly cost-effective from the TRC perspective. On average, all of the Compact's energy efficiency programs combined are estimated to have a benefit cost ratio of 2.2 from the energy system perspective – slightly higher than when viewed from the TRC perspective.

**Table 2.6 Cost Effectiveness Results: Electric System Test.**

	Cumulative Program Costs (\$1000)	Cumulative Program Benefits (\$1000)	Net Benefits (\$1000)	Benefit- Cost Ratio
<b>Low-Income Programs</b>				
Single Family	425	658	233	1.5
Multi-Family	122	200	78	1.6
New Construction	25	16	-9	0.7
<u>Total Low-Income</u>	<u>572</u>	<u>874</u>	<u>302</u>	<u>1.5</u>
<b>Residential Programs</b>				
New Construction	544	237	-307	0.4
Products and Services	854	3,175	2,321	3.7
High Use	519	892	373	1.7
<u>Total Residential</u>	<u>1,917</u>	<u>4,303</u>	<u>2,387</u>	<u>2.2</u>
<b>Commercial &amp; Industrial Programs</b>				
New Construction	603	793	189	1.3
Medium and Large Customers	326	991	666	3.0
Small Customers	694	2,008	1,315	2.9
Government Agencies	226	543	317	2.4
Products and Services	163	303	140	1.9
<u>Total Commercial &amp; Industrial</u>	<u>2,011</u>	<u>4,638</u>	<u>2,627</u>	<u>2.3</u>
<b>Total Programs</b>	<b>4,500</b>	<b>9,816</b>	<b>5,316</b>	<b>2.2</b>

## 2.6 Consistency With The Overall State Energy Efficiency Goal

The Restructuring Act requires that a municipal aggregator must demonstrate that its energy plan is consistent with state energy efficiency goals in order to obtain ratepayer funding. As described in Section 8, the Compact's EEP is not only consistent with the state energy efficiency goals, it is likely to achieve each of the goals to a high degree.

The *overall* statewide energy efficiency goal is to protect the environment and strengthen the economy by increasing the efficiency of energy use. The efficiency measures installed by the Compact in a single year are expected to save roughly 13,883 MWh per year, and 221,650 MWh over the lifetimes of the measures (see Section 8). These

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savings will result in lower electricity costs for the residents and businesses on Cape Cod and Martha's Vineyard, and will directly reduce the emissions produced by New England power plants.

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## 3. Residential Programs

### 3.1 Overview of Residential Programs

There were approximately 163,400 residential electricity customers in the Compact's territory in 1999. These customers consumed approximately 954 GWh of electricity throughout the year. Residential customers represent 87 percent of all Compact electricity customers, but their electricity consumption represents only 54 percent of total electricity consumption, due to the lower amount of electricity consumed per customer.

The Compact's residential energy efficiency programs are designed to address all of the main residential electricity end-uses, including space heating, water heating, refrigeration, lighting and major appliances. They are also structured to be available to all of the various customer types, including low-income, new customers, high-use customers, and moderate-use customers. In addition, the programs are linked together, so that customers participating in one residential program will be informed of, and encouraged to participate in, other residential programs.

Our residential programs also offer some customers with a choice of switching to alternative fuel sources, where it is efficient and cost-effective to do so. Customers with electric space heating systems will be provided financial and technical support for switching to efficient gas, propane or oil heating systems. Customers with electric water heating systems will be provided financial and technical support for switching to efficient gas, propane or oil water heaters. These efforts will be coordinated with Colonial Gas Company's Energy Management Programs, which offer rebates to customers installing high-efficiency gas boilers and water heaters.

The Residential High-Use program includes a revolving loan fund to help finance the space heating systems. Customers will be offered a rebate plus a loan, which combined will equal the total cost of installing the efficiency measures. Participating customers will be required to repay the loan over a five-year period, but no interest payments will be required.

The Compact will implement the Residential Conservation Service (RCS) as a part of its residential programs. This statewide service is mandated by legislation and is designed to provide residential customers with education and technical assistance regarding home energy use, regardless of the type of fuel used to heat the home. The program is overseen by the DOER, and is currently being redesigned in order to make it more cost-effective and more likely to achieve significant efficiency savings. The goal of the RCS is to provide a single source for "in-home" energy services to non-low-income customers. It will provide customers with a home energy audit and follow-up efficiency services. The Compact's High-Use program will be integrated into the RCS program, because they both have the same structure and the same goal of providing energy audits with in-home efficiency services.

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## 3.2 Residential New Construction and Rehabilitation

### Program Design

This program addresses all homes that are newly built or undergo major renovations. The program is targeted to home buyers, home builders and the residential construction trade allies, with the long-term goal of promoting efficient residential construction practices and increasing demand for efficiency in both construction design and heating and cooling systems. The program is available to all new homes, regardless of the type of heating fuel used.

This program is based on the ENERGY STAR Home Program, designed by the US EPA and DOE. The ENERGY STAR Home Program is a national, voluntary program that develops partnerships with home builders, home building contractors and related industries. It is being implemented by electric utilities in Massachusetts and other Northeast states, and is oriented toward market transformation.

In the Massachusetts region, the ENERGY STAR Home Program is administered by a Joint Management Committee (JMC), made up of representatives of the participating utilities. Conservation Services Group (CSG) is the program coordinator and is responsible for the overall implementation and marketing of the program.

The program offers home builders and buyers a free home energy certification, as long as the completed home meets the minimum standard of 86 on the Home Energy Rating Scale (HERS). The program also offers rebates for efficient heating systems, efficient lighting, and efficient appliances.

### Compact and Vendor Roles

The Compact plans to participate in the Joint Management Committee, and to coordinate its efforts with the utilities in the region delivering this program. CSG has the responsibility for the overall implementation and marketing of the program state-wide. The Compact Management Contractor will oversee the work of CSG, providing guidance on program design, processing the necessary payments, and overseeing the monitoring and evaluation of the program. The Compact will assist in the promotion of this program, by working closely with CSG, as well as homebuyers, homebuilders and construction trade allies.

### Marketing and Promotion

CSG has been contracted by the JMC to develop a new, comprehensive marketing plan, which includes outreach to builders, contractors, and other trade allies, to be coordinated across all of Massachusetts. Marketing strategies will include participating in trade shows, attending and participating in home builder and home buyer seminars, sponsoring building code training sessions, leveraging of trade allies, a web site and 800 number, the use of mass media, and direct outreach to builders.

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## Efficiency Measures

The home energy rating system addresses building shell measures, heating systems, lighting systems, and hot water heaters. Therefore, homebuilders and homebuyers have an incentive to purchase energy efficient measures and technologies in order to increase their home energy rating. In addition, the program offers rebates for the following measures in order to overcome market barriers.

- **Appliances.** A rebate is provided if three or more of the following ENERGY STAR appliances are purchased and installed in the home: refrigerator, dishwasher, room or central air conditioner, or clothes washer.
- **Lighting.** Qualifying homes are eligible for rebates for ENERGY STAR rated lighting fixtures. Efficient lighting products will also be available through the Residential Products and Services Program.
- **HVAC.** The program offers HVAC system commissioning, including load calculations, duct leakage testing, register air flow testing, and efficiency charge testing of central air conditioner installations.

## Program Participation Incentives

This program will provide incentives directly to the participating home builders and buyers. Incentives will be designed in conjunction with the utilities offering the ENERGY STAR Homes program in the region, in order to create consistency in the new construction marketplace. The following incentives are currently planned.

- **A free Home Energy Rating certification.** This certification will enable participants to take advantage of energy efficient mortgage products currently available through the EPA's ENERGY STAR program.
- **Appliances.** A rebate of \$500 will be provided if three or more ENERGY STAR appliances are purchased and installed in the home.
- **Lighting.** Qualifying homes are eligible for rebates of up to \$500 for ENERGY STAR rated lighting fixtures. Participants may also receive rebates that are offered through the Residential Lighting and Appliance Program.
- **Renovation projects.** Incentives for renovation participants will be available if the heating system is converted from electric heat to an efficient gas or oil system. Participants will receive a free Home Energy Rating certification, financial incentives to bring the existing building shell up to minimum program standards, and the same financial incentives described above for purchasing efficient appliances and lighting measures.<sup>2</sup>

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<sup>2</sup> We have not performed a cost-benefit test for this component of the program at this time, due to a lack of information on specific renovation projects that might be subject to this program. The vendor will be given the responsibility to ensure that renovation measures are cost-effective before offering them to participants.

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## **Eligible Customers and Program Goals**

Each year there are approximately 1,456 new homes constructed on the Cape, and 273 on Martha's Vineyard, for a total of 1,729. Of these, approximately 80 are low-income units, and will be served by the Low-Income New Construction Program. The participation goal for this program is to reach 26 percent of the new homes constructed in each year of the program.

## **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$209,254.

The benefit-cost ratio for this program is estimated to be 2.1, from the TRC perspective. This program will be included in a regional screening project that will be completed by the Joint Utility Working Group in the fall of 2000. The benefit-cost ratio may change as a result of that screening effort.

## **3.3 Residential Products and Services**

### **Program Design**

This program promotes the purchase and installation of energy efficient lighting measures and appliances at the time of initial purchase or replacement. All residential customers will be eligible to take advantage of the measures provided in this program. Customers that are eligible for any other residential program offered by the Compact would be served primarily through that program, but would also be offered lighting and appliance measures through this program.

This program will be used to implement the NEEP Lighting and Appliance Initiatives. It will also promote the purchase of efficient new water heaters, refrigerators, and air conditioners and provide customers with information about other appliances covered by the EPA ENERGY STAR appliance program.

The NEEP Lighting Initiative includes a catalog component and a retail sales component. The catalog component offers customers with a selection of energy efficient lighting products, and the costs of the efficiency items are subsidized by NEEP sponsors. The retail sales component provides customers with instant rebates toward the purchase of qualifying lighting products, with rebate coupons provided through the mail and at point of sale.

The NEEP Appliance Initiative promotes the purchase of high-efficiency appliances at the point of sale, by working with appliance distributors and offering promotional literature and rebates at retail appliance stores. The overall goal of the NEEP programs is to transform the markets for efficiency products by increasing the availability, consumer acceptance, and use of these products.

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The program will also provide information and labels for use by retailers and manufacturers to identify which appliances meet the ENERGY STAR energy efficiency guidelines. Appliances to be covered will include clothes washers, refrigerators, dishwashers and room air conditioners..

Customers that replace electric water heaters will be provided financial assistance for installing an efficient electric, gas or oil water heater. The specific type of water heater installed for any one customer will depend upon the unique characteristics of the home, the customer-specific cost-benefit analysis conducted by the program vendor, and the customer's preference.

### Compact Role

The Compact Management Contractor will conduct a competitive bidding process to identify the most appropriate vendors to implement the different components of this program. The Compact Management Contractor will oversee the work of the vendors in its entirety, including making the vendor selection, providing guidance on program design, processing the vendor payments, and overseeing the monitoring and evaluation of the program. The Compact will join NEEP, and work with the various NEEP stakeholders in the on-going development and design of these appliance initiatives. The Compact will assist with the marketing of this program through its local networks and contacts on the Cape and Vineyard.

### Vendor Role

Utilities participating in the NEEP Lighting and Appliance Initiatives hire contractors to implement the programs. Because of the municipalities' competitive bidding requirements, the Compact Management Contractor will conduct a competitive bidding process to identify the appropriate contractor to implement these programs on the Cape and Vineyard. The contractor hired by the NEEP utilities will be eligible to compete in this process against other interested contractors.

The vendors will be responsible for all aspects of delivering this program, including developing and implementing the marketing plan, identifying eligible participants, working with lighting and appliance distributors and retailers, providing educational materials, and processing rebates. The vendors responsible for the lighting and clothes washer initiatives will coordinate extensively with the program designs, materials and marketing efforts of NEEP.

### Marketing and Promotion

NEEP develops a common marketing theme throughout the region for its Lighting and Appliance Initiatives, while each NEEP sponsor implements the marketing effort in its own geographic territory. NEEP organizes joint marketing and education efforts that may include informative literature, television, newspaper, radio, point-of-sale material, and bill stuffers.

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The marketing materials from the NEEP Lighting and Appliance Initiatives will be used to promote the other components of this program. The Compact will also assist with the marketing of this program through its local networks and contacts on the Cape and Vineyard.

### Efficiency Measures

- **Lighting.** Participating customers will be eligible to receive rebates for up to six CFLs, and four efficient lighting fixtures per year. Participating customers will receive a \$5 rebate for each CFL, and a \$15 rebate for each efficient lighting fixture purchased.
- **Clothes washers.** Customers purchasing ENERGY STAR clothes washers will be provided a \$75 rebate, regardless of the type of fuel that is used for water heating.
- **Water Heaters.** Customers will be provided with financial assistance for replacing electric water heaters with an efficient electric, gas or oil water heater. Customers choosing to install new water heaters will be offered a \$100 rebate.
- **Other appliances.** Customers will be provided with information about purchasing ENERGY STAR appliances, and of electricity bill savings that can be gained from ENERGY STAR appliances.

### **Eligible Customers and Program Goals**

- **Lighting.** All of the residential customers within the Compact's territory will be eligible for lighting rebates. The participation goal for CFLs and fixtures is to reach five percent of customers in each year of the program.
- **Clothes washers.** We assume that 80 percent of residential customers have washing machines, and that each machine has a 12-year life on average, meaning that 8.3 percent of the machines are replaced each year. This translates into a target market of roughly five percent of all residential customers seeking new washers each year. The participation goal is to reach 12 percent of this target market in each year of the program.
- **Water heaters.** We assume that 25 percent of residential customers have electric water heaters, and that each existing water heater has a 14-year life on average, meaning that seven percent of the heaters are replaced each year. This translates into a target market of roughly two percent of residential customers seeking new water heaters. The participation goal is to provide twelve percent of this target market with efficient gas water heaters.
- **Refrigerators and air conditioners.** The participation goal is to reach 22 percent of the target refrigerator market and 18 percent of the target air conditioning market in each year of the program.

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## **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$328, 579.

The benefit-cost ratio for this program is estimated to be 1.4, from the TRC perspective.

## **3.4 Residential High-Use Customers**

### **Program Design**

This program addresses residential customers with high electricity demands, including single-family and multi-family dwellings, and including customers with electric space heat. Customers will only be allowed to participate in this program if their electricity usage is above a certain threshold (e.g., 10,000 kWh per year). Seasonal residents of the Cape and Vineyard will not be eligible for this program.

Participating customers will receive an energy audit that will include, among other things, a space heating replacement analysis and a water heating replacement analysis. Qualifying customers will be offered financial assistance to replace an electric space heating system with an efficient gas, propane, or oil heating system. This program will be coordinated with Colonial Gas Company's Energy Management Program, which offers incentives for customers purchasing efficient gas space heaters and water heaters.

In addition to the home energy audit, customers will receive energy efficiency education, direct installation of low-cost efficiency measures, and discounts on the installation of higher-cost measures. Participating customers will be offered measures to reduce space heating and cooling requirements, such as thermostats, insulation and air sealing measures. Customers will also be offered financial assistance to improve the efficiency of hot water heating systems, refrigerators, clothes washers and lighting systems, through the Residential Products and Services Program.

This program will be integrated into the Residential Conservation Service program, and will utilize the same "in-home" services approach. The RCS is a legislatively mandated program to provide home energy audits, efficiency information, and follow-up efficiency services to all interested residents of the state, regardless of the type of fuel used to heat their homes. The program is overseen by the DOER, and is currently being redesigned in order to make it more cost-effective and more likely to achieve significant efficiency savings. As a part of this redesign process, the Massachusetts Program Administrators are preparing a Coalition Action Plan to determine RCS program design and delivery issues. The Compact will integrate the components of the new RCS program into a similar program structure as the Residential High Use Program. The main differences between the two programs are (a) the RCS program will have to meet legislative requirements, (b) the RCS program will be available to all residents of the Cape and Vineyard, regardless of their fuel type or their electricity usage level, and (c) the RCS program will offer efficiency measures on a fuel-blind basis.

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### Compact Role

The Compact Management Contractor will conduct a competitive bidding process to identify the most appropriate vendor to implement this program. The Management Contractor will oversee the work of the vendor in its entirety, including making the vendor selection, providing guidance on program design, processing the vendor payments, and overseeing the monitoring and evaluation of the program. The Compact will also assist with the marketing of this program through its local networks and contacts on the Cape and Vineyard. The Compact Management Contractor will be responsible for administering the revolving loan fund used to support customers who choose to replace their electric heating system.

### Vendor Role

The vendor will be responsible for all aspects of delivering this program, including developing and implementing the marketing plan, identifying eligible participants, conducting the energy audits, installing low-cost measures during the audit, and installing additional measures as warranted. The vendor will have the option to hire contractors to install new measures, if necessary.

### Marketing and Promotion

The marketing strategy will be developed by the vendor, and may include informative literature, television, newspaper, or radio advertisements, point-of-sale material, and bill stuffers. The marketing of this program will be coordinated with the marketing of the Residential Products and Services Program.

### Efficiency Measures

- Space heating. Participating customers will be provided with an analysis of the costs and benefits of replacing the existing electric space heating system with efficient gas, oil or propane systems. In order to qualify for Compact funding, a gas furnace must have an AFUE rating of 90 percent or greater, and a gas boiler must have an AFUE rating of 85 percent or greater. Oil and propane systems will also be required to meet comparable efficiency ratings.

The program vendor will also conduct an economic analysis of supplementing the existing electric space heating system with a “partial” gas, oil or propane space heating system. A partial heating system would include room heaters in selected rooms in the house (as opposed to a central heating system), and would be backed-up by the electric space heating system when necessary.

The space heating analysis will take account of the specific characteristics of the customer’s home, e.g., the availability of natural gas or propane, whether there is existing ductwork in the home, whether there is an existing flue for the home, the remaining life of the existing system, and whether a partial space heating system would be appropriate. Space and water heating replacements will only be supported if (a) the customer-specific analysis indicates that the replacement is cost

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effective, (b) the customer chooses the replacement, and (c) the customer is willing to repay the no-interest loan.

Participating customers will be provided with the following space heating measures, as appropriate: insulation and air sealing, ENERGY STAR set-back thermostats, filter changes for HVAC systems, duct leakage mitigation measures, and equipment maintenance information.

- **Water heating.** Customers will be provided with a rebate for replacing electric water heaters with an efficient gas or oil water heater. These measures will be provided through the Residential Products and Services Program. Participating customers may also be provided with pipe insulation and water heater wraps.
- **Lighting and appliances.** Where appropriate, customers will be encouraged to replace existing refrigerators, clothes washers and lighting measures through the Residential Products and Services Program.

#### Program Participation Incentives

- **Space heating.** Customers choosing to install efficient gas space heaters will be offered a \$400 rebate plus a no-interest loan to cover the remaining incremental cost of the measure. The rebate is intended to be a relatively small portion of the total installation costs, to prevent inappropriate distortions in customer decision-making, and to prevent inequitable allocation of the energy efficiency funds across customers. Where appropriate, the \$400 rebate for an efficient gas system will be provided by Colonial Gas Company through its Energy Management Program.
- **Water heating.** Customers choosing to install new water heaters will be offered a \$100 rebate, through the Residential Products and Services program.
- **Lighting and Appliances.** Rebates for lighting and appliances will be provided through the Residential Products and Services Program.

#### **Eligible Customers and Program Goals**

There are roughly 19,500 residential customers within the Compact's territory using electric space heat, with an average use of 10,400 kWh per year.<sup>3</sup> On average, half of these customers will be eligible for this program. The participation goal for each year of the program is to provide 10 percent of the high-use customers with home energy audits, efficiency information, space heating efficiency measures, and references to the Products and Services Program. An additional goal is to provide efficient gas, oil or propane space heating systems to nine percent of eligible customers that qualify for these measures. We estimate this to be roughly 44 participants each year of the program.

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<sup>3</sup> This figure does not include the seasonal customers on the Cape and Vineyard that might use electric space heat for a portion of the year. The space heating component of this program will be limited to annual customers, in order to achieve the most amount of efficiency savings with the funding available.

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### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$290,318

The benefit-cost ratio for this program is estimated to be 1.0, from the TRC perspective.

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## 4. Low-Income Programs

### 4.1 Overview of Low-Income Programs

There are over 14,300 residential electricity customers on the Cape and Martha's Vineyard that qualify as low-income. While low-income customers account for roughly nine percent of the total number of residential customers, they are an important component of the residential energy efficiency programs because they tend to use more electricity than other residential customers. One reason for this is that they rely more heavily upon electricity for space heating. Roughly 20 percent of low-income customers rely upon electric space heating, while only 12 percent of other residential customers do. Low-income customers are also an important component of the Compact's Energy Efficiency Plan because their electricity bills tend to represent a larger portion of their total expenses, relative to other residential customers.

In recent years, the Massachusetts electric companies have begun coordinating their low-income efficiency programs through the Low-Income Energy Affordability Network. This network provides support in the design of low-income programs, and provides a connection to the local weatherization agencies that operate throughout Massachusetts. The Compact will also coordinate its low-income programs with the LEAN initiatives. The program designs in this EEP are based on the LEAN programs and measures, and the delivery of these programs will be coordinated with the local weatherization agencies on Cape Cod and Martha's Vineyard.

### 4.2 Low-Income Single-Family

#### Program Design

This program addresses all low-income customers living in single-family dwellings. The program will be made available to all customers that are presently billed on the Commonwealth Electric Company's Residential Assistance Rate. Other eligible households include those who receive assistance from government agencies such as Fuel Assistance, Weatherization Assistance Programs (WAP), Aid to Families With Dependent Children, Supplemental Social Security, Women Infants and Children programs, or customers whose household income levels fall below 200 percent of the federal poverty level. Those customers that have already been provided weatherization services may be eligible for this program, as long as there are sufficient additional efficiency measures available.

The program includes two components: an appliance maintenance program (AMP) and a space heating component. Eligible customers will receive an energy audit, including direct installation of low-cost measures addressing primarily the lighting and water heating end-uses. During the audit process, technicians will identify the need for additional services such as space heating measures or refrigerator replacements.

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Customers will also be provided with education materials providing advice on how to reduce electric bills through more efficient practices. Customers will not be required to incur any costs of program participation.

### Compact Role

This program will be delivered through local WAP agencies on the Cape and Vineyard. The Compact Management Contractor will oversee the work of the WAP agencies in its entirety, including providing guidance on program design, assisting with marketing, and overseeing the monitoring and evaluation of the program. The Compact will also help promote this program through local churches, social service agencies and town governments.

### Vendor Role

The local WAP agencies that are selected to deliver this program will be responsible for all aspects of delivering this program, including developing and implementing the marketing plan, identifying eligible customers, providing energy audits, installing low-cost efficiency measures, identifying the need for additional measures, obtaining and installing the additional measures, providing educational materials, and providing any follow-up services as necessary. At their discretion, the WAP agencies may contract with outside vendors for measure installation services. The WAP agencies will also be responsible for determining whether households that have previously been visited with weatherization services should be visited again in order to provide additional measures.

### Marketing and Promotion

Customers will be contacted directly by the WAP agencies. Promotional material and literature will also be distributed through the WAP agencies, local social service agencies, town governments, and other networks available to the Compact. Bill inserts and direct mailing will also be used.

### Efficiency Measures

The AMP component of this program offers participants a package including up to five compact fluorescent lightbulbs (CFL), hot water flow restrictors, pipe insulation and water heating tank wraps as applicable, replacement of existing refrigerators and freezers where applicable, and replacement of electrically-heated water beds with “flat” beds. Where applicable, customers (or their landlords) will also be informed about any additional efficiency measures offered to customers through the Residential Products and Services Program.

The space heating component of this program will provide weatherization measures such as air sealing, insulation, thermostat controls, interior storm windows, and pipe and hot water tank wraps. Where applicable, customers (or their landlords) will also be informed about the space heat replacement incentives offered to customers through the Residential High-Use Program.

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## **Eligible Customers and Program Goals**

According to the 1990 census, there are 14,328 households within the Compact's territory that are under 175 percent of the federal poverty level.<sup>4</sup> Roughly 80 percent of these are single family households. Roughly 20 percent of low-income households on the Cape and Vineyard use electricity for space heating. We estimate that roughly 80 percent of low-income households on the Cape and Vineyard use electricity for water heating. We also assume that 40 percent qualify for refrigerator replacements. The participation goal for this program is to reach five percent of eligible households in each year of the program.

## **Proposed Budget and Program Cost-Effectiveness**

The 2001 budget for this program is \$163,513.

The benefit-cost ratio for this program is estimated to be 3.3, from the TRC perspective.

## **4.3 Low-Income Multifamily**

### **Program Design**

This program addresses all low-income customers living in multi-family and public housing environments. The eligibility criteria for this program will be the same as for the low-income single-family program. Those customers that have already been provided weatherization services may be eligible for this program, as long as there are sufficient additional efficiency measures available.

The program includes two components: an appliance maintenance program (AMP) and a space heating component. Eligible customers will receive an energy audit, including direct installation of low-cost measures addressing primarily the lighting and water heating end-uses. During the audit process, technicians will identify the need for additional services such as space heating measures or refrigerator replacements. Customers will also be provided with education materials providing advice on how to reduce electric bills through more efficient practices. Customers will not be required to incur any costs of program participation.

### **Compact Role**

This program will be delivered through local WAP agencies on the Cape and Vineyard. The Compact Management Contractor will oversee the work of the WAP agencies in its entirety, including providing guidance on program design, assisting with marketing, and overseeing the monitoring and evaluation of the program. The Compact will also help promote this program through local churches, social service agencies and town governments.

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<sup>4</sup> The number of customers eligible for the low-income programs will be higher, now that the eligibility level has been increased to 200 percent of the federal poverty level.

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### Vendor Role

The local WAP agencies that are selected to deliver this program will be responsible for all aspects of delivery, including developing and implementing the marketing plan, identifying eligible customers, providing energy audits, installing low-cost efficiency measures, identifying the need for additional measures, obtaining and installing the additional measures, providing educational materials, and providing any follow-up services as necessary. At their discretion, the WAP agencies may contract with outside vendors for measure installation services. These agencies will be responsible for determining whether households that have previously been visited with weatherization services should be visited again in order to provide additional measures. The WAP agencies will be responsible for working in conjunction with Public Housing Authorities and private owners and managers of dwellings to facilitate program implementation.

### Marketing and Promotion

Marketing will be targeted to Public Housing Authorities and owners of multi-family low-income housing facilities. Public Housing Authorities and owners will be contacted directly by the vendor. Promotional material and literature will also be distributed through the WAP agencies, local social service agencies, town governments, and other networks available to the Compact.

### Efficiency Measures

The AMP component of this program offers participants site visit diagnostics, customer education, disaggregation of the customer's electricity bill, analysis of high-use appliances, and installation of efficiency measures. The package of measures also includes up to five compact fluorescent lightbulbs (CFL), hot water flow restrictors, pipe insulation and water heating tank wraps as applicable, replacement of existing refrigerators and freezers where applicable, and replacement of electrically-heated water beds with "flat" beds.

The space heating component of this program will provide weatherization measures such as air sealing, insulation, thermostat controls, interior storm windows, and pipe and hot water tank wraps. Where applicable, customers (or their landlords) will also be informed about the space heat replacement incentives offered to customers through the Residential High-Use Program.

Public Housing Authorities, building owners and managers will be provided with educational materials offering advice on how to improve electricity efficiency and reduce operating costs through energy management and maintenance practices. Where applicable, building owners (or tenants) will also be informed about any other relevant measures offered to customers through the Residential Products and Services Program.

### **Eligible Customers and Program Goals**

According to the 1990 census there are 14,328 households within the Compact's territory that are under 175 percent of the federal poverty level. We estimate that 20 percent of

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these are multi-family households, which means that roughly 2,866 customers are eligible for this program.

Out of all the households eligible for this program, we assume that 40 percent qualify for refrigerator replacements. This means that roughly 1,110 households are eligible for the refrigerator component of this program. The participation goal for this program is to reach roughly 6.5 percent of eligible households in each year of the program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$47,013.

The benefit-cost ratio for this program is estimated to be 3.5, from a TRC perspective.

## **4.4 Low-Income New Construction and Rehabilitation**

### **Program Design**

This program addresses all low-income housing units that are newly built or that undergo major renovations. The program is targeted to low-income housing development agencies, WAP agencies, home builders, and the residential construction trade allies. The program is available to all new low-income housing units, regardless of the type of heating fuel used.

This program will offer the same services that are provided by the Residential New Construction Program. The program offers home builders with a free home energy certification, as long as the completed home meets the minimum standard of 86 on the Home Energy Rating Scale (HERS). It also offers rebates for efficient lighting and appliances. Efficient lighting systems and appliances will also be promoted through the Residential Products and Services Program.

This program differs from the Residential New Construction Program in that it (a) will be focused on a few key housing projects, (b) will rely on a more targeted marketing effort, and (c) will include intensive coordination with low-income housing agencies.

Experience has shown that some low-income housing projects have such limited funding sources that the additional contribution for energy efficiency services can make the difference between a feasible and an unfeasible project. This program will seek to address those low-income housing projects most in need of energy efficiency services.

### **Compact Role**

This program will be delivered through local WAP agencies on the Cape and Vineyard. The Compact Management Contractor will oversee the work of the WAP agencies in its entirety, including providing guidance on program design, assisting with marketing, and overseeing the monitoring and evaluation of the program. The Compact will also help promote this program through local churches, social service agencies and town governments.

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### Vendor Role

The local WAP agencies that are selected to deliver this program will be responsible for all aspects of delivering this program, including identifying candidate participants, coordinating efforts with the low-income housing agency and builders, conducting the home energy rating, installing any appropriate efficiency measures, providing educational materials, and providing any follow-up services as necessary. At their discretion, the WAP agencies may contract with outside vendors for measure installation services. The WAP agencies will coordinate with the Residential New Construction Program vendor regarding the program designs, materials and measures used.

### Marketing and Promotion

This program will be marketed through direct mailing, telephone, and personal contacts with agencies building low-income housing projects on the Cape and Vineyard. Experience indicates that such agencies will be very receptive to proposals for the energy efficiency services offered. The marketing effort for this program will be coordinated with the marketing of the Residential New Construction Program.

### Efficiency Measures

The home energy rating system addresses building shell measures, heating systems, lighting systems, and hot water heaters. Therefore, homebuilders and homebuyers have an incentive to purchase energy efficient measures and technologies in order to increase their home energy rating. In addition, the program offers rebates for the following measures in order to overcome market barriers.

- Appliances. A rebate is provided if three or more of the following ENERGY STAR appliances are purchased and installed in the home: refrigerator, dishwasher, room or central air conditioner, or clothes washer.
- Lighting. Qualifying homes are eligible for rebates for ENERGY STAR rated lighting fixtures. Efficient lighting products will also be available through the Residential Products and Services Program.
- HVAC. The program offers HVAC system commissioning, including load calculations, duct leakage testing register air flow testing, and efficiency charge testing of central air conditioner installations.

### Program Participation Incentives

This program will provide incentives directly to the participating home builders or low-income housing agencies. Incentives will be designed in conjunction with the utilities offering the ENERGY STAR Homes program in the region, in order to create consistency in the new construction marketplace. The following incentives are currently planned.

- A free Home Energy Rating certification. This certification will enable participants to take advantage of energy efficient mortgage products currently available through the EPA's ENERGY STAR program.

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- Appliances. A rebate of \$500 will be provided if three or more ENERGY STAR appliances are purchased and installed in the home.
  - Lighting. Qualifying homes are eligible for rebates of up to \$500 for ENERGY STAR rated lighting fixtures. Participants may also receive rebates that are offered through the Residential Lighting and Appliance Program.
  - Renovation projects. Incentives for renovation participants will be available if the heating system is converted from electric heat to an efficient gas or oil system. Participants will receive a free Home Energy Rating certification, financial incentives to bring the existing building shell up to minimum program standards, and the same financial incentives described above for purchasing efficient appliances and lighting measures.<sup>5</sup>

### **Eligible Customers and Program Goals**

We estimate that roughly 80 low-income units per year will be constructed on the Cape and Vineyard annually, based on information provided by local WAP agencies. The participation goal is to serve 20 percent of eligible low-income units in each year of the program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$22,781.

The benefit-cost ratio for this program is estimated to be 1.7, from the TRC perspective.

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<sup>5</sup> We have not performed a cost-benefit test for this component of the program at this time, due to a lack of information on specific renovation projects that might be subject to this program. The vendor will be given the responsibility to ensure that renovation measures are cost-effective before offering them to participants.

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## 5. Commercial and Industrial Programs

### 5.1 Overview of Commercial and Industrial Programs

There were 23,762 commercial and industrial (C/I) electricity customer accounts within the Compact's territory in 1999. These customers consumed approximately 827 GWh of electricity throughout the year. Commercial and industrial customers represent only 13 percent of all electricity customers on the Cape and Vineyard, but their electricity consumption makes up 46 percent of total electricity consumption.

Small C/I customers (i.e., with peak demands of less than 100 kW) represent approximately 96 percent of the Compact's commercial and industrial customers, and their electricity consumption represents roughly 65 percent of the total C/I consumption. Consequently, these customers will play an important role in the Compact's energy efficiency programs. The Compact will also focus on providing energy efficiency services to government agencies, because of its ability to contact and work with these agencies easily. Government agencies represent roughly seven percent of C/I customers and 19 percent of C/I electricity consumption.

Some commercial and industrial programs differ from the residential programs in that they will be "vendor driven." The Compact will maintain a list of qualified vendors, and will keep all such vendors informed of the financing and services available through each program. Qualifying vendors and customers can then bring energy efficiency proposals to the Compact for approval. Each customer will be responsible for selecting a vendor to provide technical assistance and install efficiency measures. The Compact will rely upon its Management Contractor to oversee and administer the various vendors that propose projects within the C/I programs.

The C/I programs also differ from the residential programs in that they offer customers and vendors with both a prescriptive and custom approach to energy efficiency measures. Under the prescriptive approach, the Compact Management Contractor will inform vendors and customers of a large number of energy efficiency measures and services that are available, along with pre-determined levels of financial support for each. Under the custom approach, vendors and customers are free to propose efficiency improvements that are specifically tailored to the individual customer's needs and interests. The Compact Management Contractor would then review each proposal to ensure that it is cost-effective and meets relevant program guidelines. Under this approach, customers or vendors would be reimbursed for a certain percentage of the incremental cost of the proposed efficiency measures.

Commonwealth Electric Company has provided energy efficiency services to commercial and industrial customers in the past through its Green Saver IRM Program. The majority of the efficiency measures that have been installed through this program to date have been lighting retrofits of existing facilities, although some HVAC and process measures have also been addressed. The Compact's C/I programs will seek to reach all qualifying C/I

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customers. Those that have been served by the Green Saver program are likely to require less assistance with lighting efficiency improvements.

## 5.2 C/I New Construction and Rehabilitation

### Program Design

This program targets all time dependent energy efficiency opportunities in the commercial and industrial sector. It promotes energy efficiency in the design and construction of all new commercial, industrial, institutional, government, and multi-family facilities. It is also available to these customer types at the time of substantial reconstruction, renovation or major remodeling of existing buildings. This program also provides incentives for the installation of efficient equipment at the time of initial installation or when existing equipment reaches the end of its useful life. Eligible customers and vendors are encouraged to submit proposals for site-specific projects, i.e., the program is vendor-driven.

This program is primarily based the C/I new construction programs being offered by electric distribution companies in the region, in order to help eliminate customer confusion and achieve consistent approaches to C/I efficiency throughout the region. Participating customers will be offered financial assistance, education, project design and commissioning services. Customers will also be offered financial incentives to install high-efficiency motors, through the C/I Products and Services Program. In addition, the Compact will support the efforts of the Massachusetts utilities in improving the commercial and industrial building code, and educating and training C/I architects and builders.

### Compact Role

The Compact Management Contractor will be responsible for the activities listed below.

- Market and promote this program throughout the Cape and Vineyard.
- Establish the technical specifications and guidelines for measures that are eligible for this program. Many of these specifications and guidelines will be based upon those used by electric utilities in the region running similar programs.
- Review interested vendors to determine whether they qualify for the program. Again, this task will build off of the efforts of electric utilities in the region.
- Review applications from vendors and customers to determine if they qualify for the program.
- Process all payments to vendors and customers for work performed.
- Oversee the monitoring and evaluation of the program over time.

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### Vendor Role

All qualified vendors and customers will be encouraged to propose projects to be serviced by this program. Vendors and customers will have the full responsibility for identifying qualified customers, performing engineering studies as appropriate, identifying efficiency measures, documenting the incremental costs and savings of the measures, installing all qualifying measures, performing any on-going O&M services, and demonstrating the savings that are achieved over time.

### Marketing and Promotion

This program will be marketed using media advertisements, direct mail to customers and trade allies, customer site visits, and review of construction bulletins. The marketing of this program will be coordinated with the marketing for the other C/I programs. The Compact will also establish partnerships with local Chambers of Commerce and trade associations to promote all the C/I programs.

### Efficiency Measures

The program offers customers financial assistance, education, technical assistance and commissioning services. This program covers a wide range of efficiency measures, depending upon the customer's electricity end-uses and measure cost-effectiveness. It is expected that considerable opportunities exist in the areas of lighting, motors, variable speed drives, building envelop measures, process redesign and improvement, and HVAC systems. The Compact will investigate opportunities to provide other program design components offered by utilities, including the Accelerated Application Process, Commissioning Services, the Comprehensive Design Approach, and the Comprehensive Chiller Strategy.

### Program Participation Incentives

Customer financial incentives will be based on the incremental equipment and labor costs of installing efficient equipment. There are two types of rebates offered: prescriptive and custom. Prescriptive rebates are fixed amounts provided for specific efficiency measures, while customer rebates are based on the unique energy savings criteria of a customer's efficiency projects. In general, rebates are designed to cover up to 80% of the incremental cost of the efficiency measure, or to buy down the cost of the equipment to a one and a half year payback period, whichever is less. For some of the more comprehensive design projects, rebates are meant to cover 90% of the incremental cost, or to buy down the cost of the equipment to a one year payback, whichever is less. This program also offers design incentives, where appropriate, to cover 50 to 100 percent of incremental architectural and design costs for efficiency improvements.

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## Eligible Customers and Program Goals

It is difficult to accurately predict the extent of new construction and rehabilitation in the commercial and industrial sector. There is currently a total of 23,210 small, medium and large C/I customers on the Cape and Vineyard.<sup>6</sup> We estimate that roughly 10% of these customers will be eligible for renovation projects each year, resulting in 2,321 eligible renovation customers annually. We also estimate that new space growth occurs on the average of 2.5% per year, resulting in 580 eligible new construction customers per year.

The participation goal for this program is to serve 11 percent of both the new construction and rehabilitation customers in each year of the program.

## Proposed Budget and Program Cost-Effectiveness

The 2001 half-year budget for this program is \$232,177.

The benefit-cost ratio for this program is estimated to be 1.2.

## 5.3 Medium and Large C/I Retrofit

### Program Design

The program encourages customers to replace existing equipment and processes in their facilities with high efficiency equipment. It serves all commercial and industrial customers whose peak demands are 100 kW or greater. This retrofit program is primarily based on the large C/I retrofit programs being offered by electric distribution companies in the region, in order to help eliminate customer confusion and achieve consistent approaches to C/I efficiency throughout the region.

Qualified customers and vendors are provided with education, technical assistance, financial assistance, and commissioning services. Eligible customers and vendors are encouraged to submit proposals for site-specific retrofit projects, i.e., the program is vendor-driven.

This program will also encourage customers to participate in the C/I Products and Services Program, as appropriate.

### Compact Role

The Compact Management Contractor will be responsible for the activities listed below.

- Market and promote this program throughout the Cape and Vineyard.
- Establish the technical specifications and guidelines for measures that are eligible for this program. Many of these specifications and guidelines will be based upon those used by electric utilities in the region running similar programs.

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<sup>6</sup> This figure excludes street lighting and traffic light accounts.

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- Review interested vendors to determine whether they qualify for the program. Again, this task will build off of the efforts of electric utilities in the region.
  - Review applications from vendors and customers to determine if they qualify for the program.
  - Process all payments to vendors and customers for work performed.
  - Oversee the monitoring and evaluation of the program over time.

### Vendor Role

All qualified vendors and customers will be encouraged to propose projects to be serviced by this program. Vendors and customers will have the full responsibility for identifying qualifying customers, performing engineering studies as appropriate, identifying efficiency measures, documenting the incremental costs and savings of the measures, installing all qualifying measures, performing any on-going O&M services, and demonstrating the savings that are achieved over time.

### Marketing and Promotion

This program will be marketed using media advertisements, direct mail to customers, trade allies, customer site visits, and promotion through equipment distributors, other market actors and trade shows. The marketing of this program will be coordinated with the marketing for the other C/I programs. The Compact will also establish partnerships with local Chambers of Commerce and trade associations to promote all the C/I programs.

### Efficiency Measures

The program offers customers financial assistance, education, technical assistance and commissioning services. This program covers a wide range of efficiency measures, depending upon the customer's electricity end-uses and measure cost-effectiveness. It is expected that considerable opportunities exist in the areas of lighting, motors, variable speed drives, building envelop measures, energy management systems, process redesign and improvement, and HVAC systems.

The Compact will investigate the option of including the Accelerated Application Process in this program, where participants can use up to 85 percent of their contribution to the Compact's energy efficiency funds within a two-year rolling period. In order to qualify for the Accelerated Application Process, project proposals must meet the project standards and guidelines applied to other projects. Total expenditures for the Accelerated Application Process may be limited to 50 percent of the budget for this program in order to ensure that other customers are not precluded from participation.

### Program Participation Incentives

Customers and vendors will be encouraged to investigate energy efficiency opportunities, though a comprehensive engineering evaluation of the customer's facility. The Compact

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will pay for 50 percent of the cost of this evaluation. If the customer successfully implements the project, the Compact will also pay for the remaining 50 percent of the engineering study fee.

There are two types of rebates offered: prescriptive and custom. Prescriptive rebates are fixed amounts provided for specific efficiency measures, while customer rebates are based on the unique energy savings criteria of a customer's efficiency projects. Customer financial incentives will be based on the incremental equipment and labor costs of installing eligible efficiency measures and projects. Customers will be offered financial incentives of up to 50 percent of all incremental costs, with a cap of a buy-down to a two-year payback period. Financial incentives will be revisited in future years based on the Compact's experience, as well as changes made by utilities offering this program elsewhere in Massachusetts.

### **Eligible Customers and Program Goals**

There is a total of 352 medium and large customers on the Cape and Martha's Vineyard. Approximately 111 of these will be eligible for the Government Agencies Program, leaving 241 to be served by this program. Because Commonwealth Electric has already provided many of these customers with efficiency services, we assume that only 25 percent of medium and large customers will be eligible for the Compact program.

The participation goal for this program is to reach eight percent of customers in each year of the program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$125,320.

The benefit-cost ratio for this program is estimated to be 1.7, from a TRC perspective.

## **5.4 Small Commercial & Industrial Retrofit**

### **Program Design**

This program serves all commercial and industrial customers whose peak demands are less than 100 kW. The program encourages customers to replace existing equipment in their facilities with high efficiency equipment. Participating customers are offered a single source for information, technical assistance, financial assistance, and commissioning services. A vendor will be hired by the Compact Management Contractor to deliver all of these services to participating customers.

This program will also encourage customers to participate in the C/I Products and Services Program, as appropriate.

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### Compact Role

The Compact Management Contractor will conduct a competitive bidding process to identify the most appropriate vendor to implement this program. The Compact Management Contractor will oversee the work of the vendor in its entirety, including making the vendor selection, providing guidance on program design, processing the vendor payments, and overseeing the monitoring and evaluation of the program. The Compact will also assist with the marketing of this program through its local networks and contacts on the Cape and Vineyard.

### Vendor Role

The vendor will be responsible for all aspects of delivering this program, including developing and implementing the marketing plan, identifying eligible participants, conducting the energy audits, installing low-cost measures during the audit, and installing additional measures as warranted. The vendor will have the option to hire contractors to install efficiency measures, if necessary.

### Marketing and Promotion

The marketing will include bill inserts, program brochures, media advertisements, direct customer contact, and targeted marketing such as trade shows, and business, trade and professional publications. The Compact will also establish partnerships with local Chambers of Commerce and trade associations to promote all the C/I programs.

### Efficiency Measures

The specific technologies addressed will depend upon the needs of each participant. All end-uses are eligible for efficiency improvements, within cost-effectiveness constraints. We expect the primary opportunities will come from lighting, refrigeration, water heating and HVAC end-uses. Where appropriate, retrofitting multiple and interacting end-uses will be coordinated to ensure optimal system design (e.g., re-sizing and replacement of cooling equipment at the time of a comprehensive lighting replacement).

### Program Participation Incentives

The Compact will reimburse customers for 100 percent of all costs associated with audits of facilities. Customer financial incentives will be based on the incremental equipment and labor costs of installing efficient measures. Financial incentives will cover up to 90 percent of installed measure costs. Financial incentives will be revisited in future years based on the Compact's experience, as well as changes made by utilities offering this program elsewhere in Massachusetts.

### **Eligible Customers and Program Goals**

There is a total of 21,206 small C/I customers within the Compact's territory. Approximately 1,542 of these will be eligible for the Government Agencies Program,

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leaving 19,664 to be served by this program. The participation goal for this program is to reach roughly 10 percent of customers in each year of the program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$266,897.

The benefit-cost ratio for this program is estimated to be 2.6, from a TRC perspective.

## **5.5 Government Agencies**

### **Program Design**

This program addresses all government facilities located within the Compact's territory, including municipal, state and federal facilities. These customers will be offered the same efficiency services that are offered through the C/I New Construction, C/I Large and Medium, and C/I Small Customer Programs, depending upon their size and needs. The primary difference between this program and the other C/I programs will be in the marketing. The Compact will aggressively market this program through its network of connections with municipal governments on the Cape and Vineyard.

For new construction and large and medium C/I customers, the program will be vendor-driven. For small C/I customers, the services will be provided through a single vendor to be selected by the Compact Management Contractor.

This program will also include an LED Traffic Light component, similar to the traffic light program being offered by other Massachusetts utilities.

### Compact and Vendor Roles

The government agencies will be provided the same efficiency services that are offered through the other C/I programs. Hence, the Compact and vendor roles will be similar to those described above for the other programs.

### Marketing and Promotion

This program will be marketed along with all of the other programs offered to C/I customers. These marketing campaigns will be supplemented with a marketing effort by the Compact. It is expected that there will be significant interest in this program among municipal water departments and schools. In addition, the Compact will work with the DOER to identify and contact state and federal facilities in the region that are good candidates for this program.

### Efficiency Measures and Participation Incentives

The government agencies will be offered the same efficiency measures and the same technical and financial support as the customers in the other C/I programs. The LED

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Traffic Light component will provide municipalities with rebates for retrofitting traffic lights. In future years, the Compact expects to offer municipal governments a program to improve the efficiency of street lighting.

### **Eligible Customers and Program Goals**

All government agencies that meet the eligibility requirements of the C/I programs will be eligible for this program. There are roughly 1,653 government accounts on the Cape and Vineyard, of which roughly 1,542 are small, while 111 are medium or large. Our participation goal is to reach roughly 15 percent of eligible small and 10 percent of eligible medium and large customers in each year of the program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$86,622.

The benefit-cost ratio for this program is estimated to be 1.5.

## **5.6 Commercial and Industrial Products and Services**

### **Program Design**

The purpose of this program is to transform the markets for particular energy efficiency products, services and practices. The Compact will participate in the regional C/I market transformation programs that are being designed and coordinated through NEEP and other regional efficiency agencies. This includes the following initiatives:

- **Premium Efficient Motors.** This NEEP program seeks to transform the market for motors by offering customers rebates for purchasing and installing premium-efficiency motors, as qualified by the Consortium for Energy Efficiency. The utilities sponsoring this program – including 21 utilities throughout New Jersey, Connecticut, Massachusetts, Vermont, Rhode Island, and New Hampshire – have hired a contractor who is responsible for identifying, recruiting, and training trade allies to support program efforts.
- **Unitary HVAC (Cool Choice).** This NEEP initiative is designed to increase the availability of energy efficient HVAC products and service through marketing, customer rebates, education of contractors, promotion of high-efficiency HVAC among consumers and equipment specifiers, and working with other organizations to promote higher national standards for HVAC equipment. The program is delivered through a regional circuit-rider who informs packaged HVAC retailers about the programs and distributes the appropriate rebate information.
- **Compressed Air Initiative.** This program will be conducted by participating in the US DOE's Compressed Air Challenge. This initiative seeks to enhance the knowledge of the efficiency opportunities regarding compressed air system design,

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installation and operations. Training seminars provide operators and facility engineers the opportunity to evaluate and apply efficiency measures to their own compressed air systems. Potential improvements include equipment replacement and upgrades, end-use optimization, improved operations and maintenance practices, system recommissioning, upgrading automated controls and manual operation practices, and integration and streamlining of building-wide operations.

- **Design Lights Consortium.** This NEEP program seeks to improve lighting design decisions at the time of major renovation, remodeling and new construction. The goal of this program is to facilitate improved lighting design practices and make them commonplace in all segments of the commercial and industrial lighting market. The program provides building owners, developers, electrical contractors, manufactures, designers and other stakeholders with the tools and information necessary to design lighting in a way that provides the highest quality of light from the standpoint of efficiency, comfort, productivity and aesthetics.
- **O&M and Recommissioning.** This NEEP program addresses a variety of opportunities to improve C/I buildings operation and maintenance (O&M), including improved programming of automated controls, improved manual operation practices, maintenance of equipment, and integration and streamlining of building-wide operations. The recommissioning portion of this program provides a “whole building” approach to addressing the physical changes and mechanical changes that occur in C/I buildings over time.

These programs will be coordinated with other relevant C/I programs offered by the Compact. Marketing efforts will be linked with other C/I programs, and customers that participate in those programs will be informed of this program. Opportunities for these products and services will be identified during the course of audits and technical assessments provided through the other Compact C/I programs.

### **Eligible Customers and Program Goals**

The eligible population for this program will vary according to the type of product or service. In some cases the target market is C/I customers, while in other cases the target market includes builders, developers, contractors, retailers and other trade allies. Our goal is to reach roughly two to five percent of the customers eligible for this program.

### **Proposed Budget and Program Cost-Effectiveness**

The 2001 half-year budget for this program is \$62,790.

The benefit-cost ratio for this program is estimated to be 1.4, from the TRC perspective. This estimate is based on the cost and savings associated with the Premium Efficiency Motors, the Unitary HVAC, and the Compressed Air Initiatives.

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## 6. Public Education and Marketing

The lack of consumer awareness and a corresponding limited knowledge of energy efficiency technology and practices is often cited as a key barrier to adoption of energy efficiency measures. Well-designed programs are important to overcome these barriers. But critical to the success of those programs is the ability to build consumer interest and to make and keep trusting contacts with consumers.

The Compact plans to utilize the extensive network and opportunities it has at the community level to deliver its public education and marketing programs and advance existing and emerging energy efficiency services, technologies, and practices. While the target is to overcome long recognized barriers, the general goal of the Compact is to build an ethic for energy efficiency in the Cape and Vineyard communities similar to the ethic for recycling of solid waste. Development of an energy efficiency ethic can result in increased benefits for individual consumers, for communities, and for the region. Moreover, it can serve as a vital base of support for market transformation beyond the implementation of specific technologies or practices, or beyond the lifetime of specific programs. In addition, messages on peak-shaving for winter and summer use that are incorporated into energy efficiency education will add to the long term benefits of this program.

The Cape Light Compact network is connected through six distinct segments of the community: (1) local government departments; (2) schools; (3) social service agencies; (4) social, civic, and religious organizations; (5) business and trade associations; and (6) local media.

The 23 members of the Compact Governing Board (many of whom are elected public officials, and others who have extensive utility and energy efficiency experience) are key parts of this network and are highly familiar with the nuances of how it functions in each community. For the purposes of building and sustaining consumer interest in energy efficiency, the network provides new and enhanced points of contact and opportunities for access to the general population or target groups, including hard-to-reach segments of the community. It also offers the credibility and trust of a regional non-profit effort and increased opportunities for feedback from consumers that can inform adjustments or revisions to programs on a timely basis.

At the other end of this network, the Compact will rely upon its membership in NEEP and the Consortium for Energy Efficiency, and the cooperation of utilities, to enrich the supply of information, services, and technologies flowing to consumers at the local level. The Compact also plans to work closely with trade allies and vendors to assure their views and experiences are an integral part of the flow of information to consumers.

The Compact will carry out its public education and marketing efforts through two interrelated programs. The Public Education program—CapeSmart—will carry on a multi-layered activity to provide broad awareness of the benefits of wise energy use. The Marketing program—BuySmart—will support and enhance traditional marketing efforts engaged in by vendors and trade allies.

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## 6.1 Public Education

The Public Education program will be developed as a multi-layer CapeSmart program to promote the benefits of wise energy use, and to support market initiatives. The CapeSmart program has 5 key parts; each is described in turn below.

### Media

The Compact will utilize a layered media campaign with the CapeSmart logo to promote wise use of energy. The goal will be to build general awareness on the benefits of efficient energy use, as well as periodic focus on specific practices and measures that support marketing efforts. The CapeSmart campaign will include advertising, news articles, public service announcements, flyers and inserts. In addition, the Compact will enlist the aid of well-known figures on the Cape and Vineyard for taped audio and video messages on wise use of energy. It will also solicit the participation of local cable television stations to carry regular programming on energy efficiency with vendors providing attractive demonstrations of products and services and consumers speaking from practical experience on the benefits of energy efficiency measures.

### Local Events

The Compact will also utilize its community-based organizations and events to promote energy efficiency services and practices. This will include organizing effective speakers and presentations for civic and business organizations, social organizations, trade shows, and other events. The Compact will also organize “energy efficiency fairs” to provide demonstrations of existing and emerging technologies and services in energy efficiency. The Compact’s activities in this area will also link information on local, regional and national programs to promote streamlining and coordination of energy efficiency initiatives.

### Schools

The Compact will operate a three-part program for schools. The first program will promote the ethic of wise energy use among grades 5-8 through demonstrations and other teaching aids. The second program will raise the level of educational content and demonstrations for grades 9-12. Both of these programs will engage development of wise energy use posters and/or energy projects for public awards at the “energy efficiency fairs.” The third program will provide more focused presentation to area vocational schools, and explore how the curriculum may be enhanced to provide training for energy efficiency professionals, and building trades incorporating elements of energy efficiency. Coupled with these efforts, the Compact anticipates development of a solar-in-the-schools program, and training and information on distributed generation technologies.

### Training and Demonstration Sessions

With the cooperation of trade allies, the Compact will organize training and demonstration sessions for local officials, decision-makers and business representatives

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on specific technologies or services. In addition it will encourage local participation in Massachusetts State Building Code Energy Conservation Requirements seminars for building inspectors and others who may function as a point-of-contact to help inform buyer and builder decisions. Other specific trainings may also be offered based upon local interest, or the suggestions of NEEP, the Consortium for Energy Efficiency, vendors, trade allies, or other parties.

### Website

The Compact Website will carry information on energy efficiency, applications for program participation, links to special use programs, and links to local, state, and national resources on energy efficiency. The Website program will also seek utility cooperation for links and consumer access to energy audit information and software.

## **6.2 Marketing**

While public education will provide a broad backdrop for advancing energy efficiency services and practices, the BuySmart program will offer a special focus to deliver messages and information to specific target populations. In general, this program will be coordinated with vendors to enhance their standard marketing activities. In addition, this program will include targeted activities, such as inserting informational flyers into the paychecks of employees of town and county agencies, as well as other major employers on the Cape and Vineyard.

### Residential—Low Income

Services and products include: appliance maintenance program, space heating program, also an energy audit including direct installation of lighting and water heating measures.

The Compact's knowledge of its communities and its level of contact provide significant opportunities to focus and target measures for low-income consumers. In cooperation with local service agencies, multi-lingual flyers and brochures will be used. Additionally, the Compact will augment work with weatherization and fuel assistance providers by integrating other segments of the low-income support network such as church, civic, private, and municipal funds used for fuel assistance. The Compact will also work with low-income advocacy organizations, public housing authorities, and private landlords to focus and maximize the effective use and application of energy efficiency measures.

### Residential—New Construction and Remodeling or Rehabilitation

Services and products include: ENERGY STAR Home Program-rebates on heating systems and efficient appliances, efficient lighting through NEEP program.

To advance the use of energy efficient design, materials and technologies and ENERGY STAR products in building construction, the Compact will utilize seven critical points of contact in its local network: (1) real estate agents for dissemination of information; (2) bank and mortgage agency lenders for dissemination of information; (3) registry of Deeds

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transactions for development of monthly target lists for direct mail; (4) building, plumbing and wiring inspectors personnel; (5) builders and architects; (6) building, heating, and electrical supply companies; and (7) appliance and lighting stores. The Compact will develop special seminars and meetings for those engaged in construction related businesses. Individuals or agencies who provide significant support to advance energy efficiency in construction and building will be given special recognition at the Compact's regional "energy efficiency fair."

### Residential Products and Services

Services and products include: high efficiency clothes washer, lighting, heat pumps, water heaters, dish washers, air conditioners, refrigerator replacements, and dehumidifier replacements.

In addition to promoting general education and attractive demonstrations of lighting and appliance technologies, the Compact will carry out joint efforts with NEEP and vendors, and point-of-sale dissemination of information. Additionally, the Compact will work with local appliance and lighting stores to increase accessibility to high-quality, high-performance energy efficient lighting technology.

### Residential—High Consumption

Services and products include: energy audit, geothermal heat pump, water heater, efficient gas, oil or propane heating system, as well as refrigerator, clothes washer, lighting through program above.

The Compact will work with its supplier and vendors to target direct mail information for high consumption residential users. Additionally, in communities that have a significant number of high consumption users (which the Compact has already identified), the Compact will convene meetings and special demonstrations to provide information and examine market barriers facing this customer group.

### Commercial and Industrial

Services and products include: financial assistance, education, project design, high efficiency motors, lighting, and HVAC systems.

The Compact will work with its power suppliers, the local distribution utility, and vendors to target direct mail appropriately for commercial and industrial users. Additionally, the Compact will work with local Chambers of Commerce to determine the timing and types of demonstrations and information most useful to their members. The Compact will also work with commercial landlords to reach rental or seasonal businesses with information and services.

New or Rehab C/I Construction will be addressed in the segment of the program focused on construction above. The Compact will utilize lists of builders, architects, and contractors who specialize in C/I improvements for those interested in new C/I construction.

Large and Medium C/I customers will receive specific mailings, phone calls and invitations to meetings to determine their needs and the extent to which support for vendors is needed. Small C/I Customers will receive targeted mailings and presentations at local Chambers of Commerce.

C/I and Government Agencies will receive special focus through the Compact network to assure that government agencies are providing models for the benefits of wise energy use. Meetings will be conducted with town managers, DPW administrators, school business managers and purchasers, water department managers and boards, and fire and police department chiefs to assess needs and develop plans for energy efficiency. In addition, provisions for energy efficiency will be developed for local “comprehensive plans” and submitted to town meetings for approval.

Annual targets for the public education campaign

Taped public service announcements by well known figures:	2
Cable television shows:	4
School Programs:	---
Grades 5 through 8	8
Grades 9 through 12	4
Vocational	2
Training and Demonstrations	3
Energy Fairs	2

### 6.3 Peak Shaving Program

The Compact will offer a peak shaving program – “Stop Peaking” – that will enable the Compact customers’ as a whole to lower their load factor, obtain more favorable power purchases, and improve reliability. In Phase I of the Compact’s efficiency programs, the peak shaving campaign will focus on education, information, and several low-cost peak-shaving technologies. The goal of Phase I will be to make customers more aware of the opportunities and benefits available from peak shaving, as one of the elements of the overall efficiency program. In Phase II, the peak shaving campaign will be expanded to include pilot programs for residential, commercial and industrial customers, in order to identify the opportunities for implementing time-of-use meters and time-of-use rates.

The Stop Peaking educational effort will have components that can be incorporated into other educational initiatives of the CapeSmart and BuySmart programs. It will also have separate and targeted educational efforts focusing specifically on the benefits of peak shaving. In view of the Cape’s double-peak – winter (350 MW) and summer (400 MW) – the program will focus on measures to address both seasons.

The residential component of the Stop Peaking program will consist of an education effort and general promotion of peak-shaving through low-cost, giveaway products. Customers will be provided with information about how to reduce peak electricity use by

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avoiding the use of key appliances (e.g., clothes washers, dryers, dishwashers) during the hours of peak electricity demand. Some customers will be provided with low-cost products such as air conditioning timers or setback thermostats, to help automate the peak-shaving efforts.

The small commercial component would operate in parallel to the residential program, and also promote behavioral practices and technical measures. This component would perhaps have an even stronger emphasis on summer peak, given these customers' contribution to this peak. Large commercial/industrial customers will be provided with facility audits as part of their participation in the C/I efficiency programs described in Chapter 5. These audits will be used to identify technical measures and operational modifications that can assist in shaving peak demand.

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## 7. Program Monitoring and Evaluation

The Compact energy efficiency programs will be monitored and evaluated over time to ensure that they are implemented effectively and that they are providing cost-effective savings to electricity customers. The Compact plans to hire an independent contractor to conduct the monitoring and evaluation (M&E) activities. This chapter provides an overview of the key issues pertaining to M&E efforts. The M&E contractor will be responsible for developing the detailed plans for conducting all the monitoring and evaluation activities over the life of the efficiency programs.

Monitoring and evaluation should play an important role in any energy efficiency initiative. In general, the primary goals of M&E activities include the following:

- ensuring that energy efficiency programs are being implemented as designed;
- identifying opportunities to improve upon the design of programs in order to make them more effective;
- identifying the impact of the program in terms of energy and capacity savings;
- monitoring the costs of the program;
- monitoring the cost-effectiveness of the program; and
- assessing the degree to which the program changes the market for the relevant energy efficiency measures.

Monitoring and evaluation efforts generally include four main components. The first component is a set of baseline studies of the electricity end-use measures that are in place prior to program implementation. These studies identify the saturation, types, and efficiency of existing electricity end-use measures, and provide a benchmark for measuring the effects of an energy efficiency program.

The second component is a process evaluation. The goal of a process evaluation is to monitor how well the energy efficiency program is being implemented, and to identify opportunities for improving the program design. For example, process evaluations tend to look at how well customers are responding to a particular program, how many measures are being installed, the appropriate levels of customer incentives, how many trade allies are being affected by the program, and how well the program vendor is performing its duties.

The third component of M&E efforts is an impact evaluation. The goal of an impact evaluation is to monitor the impacts of the energy efficiency program in terms of energy savings, capacity savings, or other quantitative objectives of the program. Impact evaluations can rely upon a variety of data sources, including engineering estimates, billing analyses, and end-use metering techniques.

The fourth component is a market evaluation. The goal of a market evaluation is to assess the extent to which a program is achieving market transformation objectives. Market evaluations tend to study the impacts of the programs on the manufacturers,

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distributors, and vendors of energy efficiency measures, as well as on electricity customers.

The monitoring and evaluation efforts of electric utilities are evolving to reflect the increasing interest in market transformation programs. Since market transformation programs place less emphasis on customer energy savings and greater emphasis on changes in the marketplace, M&E efforts for market transformation programs focus less on impact evaluations and more on market evaluations. Market transformation programs require increased attention to identifying market barriers, assessing progress for overcoming market barriers, identifying changes in the behavior of primary market actors, and assessing changes in the types of efficiency measures available in the marketplace.

Some of the information that tends to be tracked when monitoring market transformation programs includes the following: (a) consumer awareness of high-efficiency equipment and practices; (b) numbers of various market actors, such as dealers of high-efficiency measures; (c) quality of installation of high-efficiency equipment; (d) specific actions of different actors, such as increased production by manufacturers; (e) legislative changes, such as increased efficiency codes; (f) changes in the prices of efficiency measures; (g) increased availability of energy efficiency measures; and (h) changes in consumer purchasing patterns.

Unlike the electric utilities in Massachusetts, the Compact is not seeking to recover shareholder incentives for its energy efficiency programs. Consequently, there are no ratepayer or shareholder dollars that will be affected by the outcome of the M&E effort. Therefore, the Compact can focus all of its monitoring and evaluation efforts on ensuring that the programs are well-designed and delivered effectively and efficiently.

In recent years Massachusetts utilities have made efforts to streamline the data collection, data analysis, and administrative requirements of monitoring and evaluation efforts. There are also initiatives underway for utilities across the region to share in the M&E efforts, thereby reducing the costs and improving the performance of all participants. The Compact intends to benefit from the utilities' experience in streamlining the M&E efforts, and to participate in all applicable regional monitoring and evaluation efforts. As a partner in NEEP, the Compact will be able to take advantage of the regional monitoring and evaluation efforts undertaken by that organization.

In addition, there currently exists a wealth of information about energy efficiency measures and savings as a result of the past experience of electric utilities in the region. The Compact plans to rely upon this information when estimating the likely energy and capacity savings of its efficiency programs. As a result, the Compact can rely less heavily upon expensive and time-consuming impact evaluations (including billing analyses or end-use metering analyses). Instead, the Compact's M&E measurements can combine engineering estimates and historic evidence of savings per measure with estimates of the number of measures adopted by customers, to determine the total amount of energy savings for each measure.

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In sum, the Compact's monitoring and evaluation efforts will include the following elements:

- An independent contractor will be hired by the Compact to design and manage the monitoring and evaluation plan.
- The Compact will seek to streamline M&E efforts, and rely upon information gathered by electric utilities in the past.
- The Compact will participate in joint M&E studies and initiatives undertaken by utilities and other agencies in the region. The Compact will coordinate with Commonwealth Electric Company's monitoring and evaluation efforts, to avoid duplication and to share information in both directions.
- Baseline studies will be performed to identify the state of the market and the saturation of energy efficiency measures on the Cape and Vineyard before program implementation.
- Process evaluations will be used to ensure that the programs are being implemented effectively and to modify the programs over time for improved performance.
- Impact evaluations will be used to measure the savings and cost-effectiveness of each program. These will primarily rely upon engineering estimates and historic information.
- Market evaluations will be used to assess the extent to which market transformation goals are being achieved.
- The monitoring and evaluation plan will be modified over time to reflect the regional and national market transformation developments, and to account for lessons learned through other M&E efforts of utilities in the region.

## 8. Consistency With State Efficiency Goals

### 8.1 Summary of Program Impacts

Table 8.1 presents a summary of the energy savings associated with all efficiency measures installed by the Compact in a single year. The information in Table 8.1 is for the measures installed in 2001, but has been annualized (i.e., doubled) to indicate the savings available in a typical year. The first column presents the amount of energy savings experienced in the year of installation, while the second column indicates the amount of savings achieved over the full lifetime of the efficiency measures.

The lifetime energy savings provide an indication of which programs offer the greatest benefits. For example, the Residential Products and Services Program offers the greatest amount of savings, representing roughly 32 percent of the total lifetime energy savings. Similarly, the Small Commercial/Industrial program offers significant savings for the C/I sector, with roughly 20 percent of the total lifetime energy savings.

**Table 8.1 Summary of Energy Savings and Costs.**

Savings For Measures Installed in One Year	Annual Energy Savings (mwh)	Lifetime Energy Savings (mwh)	Lifetime Energy Savings (% total)	Annual Cost (\$1000)	Annual Cost (% total)	Cost of Saved Energy (\$/mwh)
<b>Low-Income Programs</b>						
Low-Income Single Family	602	12,546	6%	327	9%	26
Low-Income Multi-Family	180	3,624	2%	94	3%	26
Low-Income New Construction	9	182	0%	46	1%	250
<b>Total Low-Income</b>	<b>792</b>	<b>16,352</b>	<b>7%</b>	<b>467</b>	<b>13%</b>	<b>29</b>
<b>Residential Programs</b>						
New Construction	313	7,184	3%	419	12%	58
Products and Services	5,123	71,656	32%	657	19%	9
High Use	1,214	25,073	11%	378	11%	15
<b>Total Residential</b>	<b>6,650</b>	<b>103,913</b>	<b>47%</b>	<b>1,454</b>	<b>42%</b>	<b>14</b>
<b>Commercial &amp; Industrial Programs</b>						
New Construction	1,049	18,083	8%	464	13%	26
Medium and Large Customers	1,421	23,447	11%	251	7%	11
Small Customers	2,905	43,582	20%	534	15%	12
Government Agencies	632	7,764	4%	173	5%	22
Products and Services	434	8,508	4%	126	4%	15
<b>Total Commercial &amp; Industrial</b>	<b>6,441</b>	<b>101,385</b>	<b>46%</b>	<b>1,548</b>	<b>45%</b>	<b>15</b>
<b>Total Programs</b>	<b>13,883</b>	<b>221,650</b>	<b>100%</b>	<b>3,468</b>	<b>100%</b>	<b>16</b>

Table 8.1 also provides a summary of the costs to achieve the energy savings. The cost of saved energy (in \$/MWh) provides an indication of how the programs compare in terms of costs per unit of saved electricity. The Residential Products and Service program and most of the C/I programs have especially low costs. The Low-Income New Construction and Residential New Construction programs appear to have particularly high costs,

because these programs save a relatively small amount of electricity – their other customer benefits are not accounted for in the \$/MWh figure.

Figure 8.1 presents the same cost and amount of saved energy in graphical form. The Y-axis presents each program’s cost of saved energy (in \$/MWh), while the X-axis presents each program’s lifetime energy savings (in GWh). The programs are listed in order of ascending costs, and the energy savings are presented cumulatively, to indicate how the programs add together into a package. Presenting the program impacts in this way offers a quick means of comparing costs and savings across program types.

**Figure 8.1 Energy Savings and Costs, by Program.**

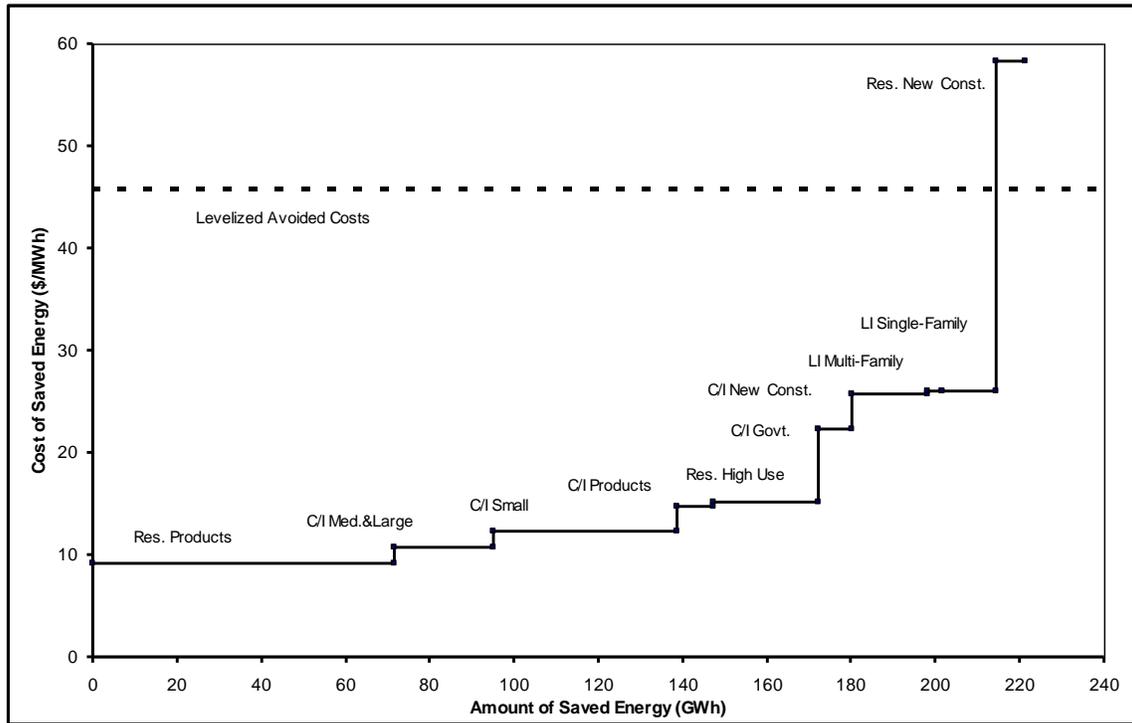


Figure 8.1 also presents the levelized avoided costs (including avoided generation costs, avoided transmission and distribution costs, and line losses) used to analyze the cost-effectiveness of the Compact’s programs. The costs and savings presented in Figure 8.1 are the same costs and benefits that are used in the Energy System test for cost-effectiveness. Thus, this figure provides a graphical presentation of the cost-effectiveness of the programs from an Energy System perspective. The significant difference between the avoided costs and the program costs indicates that the Compact’s programs are very cost effective. The Residential New Construction program is not cost-effective from this perspective, but is cost-effective from the TRC perspective because of significant gas savings.

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## 8.2 Consistency With State Energy Efficiency Goals

### The Proposed State Energy Efficiency Goals

The Electric Utility Restructuring Act specifies that in order to obtain energy efficiency funding, a municipal aggregator must submit its energy plan to the Department to certify that it is consistent with state energy efficiency goals. The DOER has proposed three levels of energy efficiency goals: an overall statewide goal, threshold goals for ratepayer-funded activities, and priority-setting goals for ratepayer-funded activities. These goals are presented in Table 8.3.

**Table 8.2 Proposed State Energy Efficiency Goals.**

<b>Overall statewide energy efficiency goal:</b> To protect the environment and strengthen the economy by increasing the efficiency of energy use.
<b>Ratepayer-funded energy efficiency threshold goals:</b> <ol style="list-style-type: none"><li>1. To save electricity cost-effectively.</li><li>2. To provide funding for energy efficiency services to low-income customers at the levels directed by the Act.</li></ol>
<b>Ratepayer-funded energy efficiency priority-setting goals:</b> <ol style="list-style-type: none"><li>3. To ensure that energy efficiency funds are allocated equitably among customer classes.</li><li>4. To ensure that there is adequate support for capturing lost opportunities.</li><li>5. To give due emphasis to statewide and regional market transformation.</li><li>6. To utilize competitive procurement processes in the delivery of program services to the fullest extent practicable.</li><li>7. To facilitate the widespread development of a competitive market for energy efficiency products and services.</li><li>8. To reduce customer energy costs by balancing short- and long-run savings from energy efficiency programs.</li><li>9. To optimize cost-effectiveness.</li></ol>

The threshold goals are intended to represent mandatory requirements that must be met in order to obtain ratepayer funding to implement energy efficiency programs. They will each be applied independently as pass/fail criteria.

The priority-setting goals are not intended to be applied as strict pass/fail criteria, but rather as a package of goals that should be optimized by a well-balanced portfolio of energy efficiency activities. In some instances, achieving one goal may hinder the achievement of other goals, in which case the program administrator must seek to achieve the appropriate balance between the competing goals.

### Consistency With The Overall State Energy Efficiency Goal

The Compact energy efficiency programs are clearly consistent with the overall goal of protecting the environment and strengthening the economy by increasing the efficiency of

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energy use. As indicated in Table 8.1 above, the efficiency measures installed in each year are expected to save roughly 13,883 MWh per year, and 221,650 MWh over the lifetimes of the efficiency measures.

These electricity savings will directly result in lower electricity costs for the residents and businesses on Cape Cod and Martha's Vineyard. They will also directly reduce the emissions produced by New England power plants.

## **Consistency With The Threshold Goals**

### To Save Electricity Cost-Effectively

The Compact energy efficiency programs are all cost-effective. As indicated in Table 2.4, each program has a benefit-cost ratio greater than one. Taken as a whole, the Compact's energy efficiency programs are highly cost-effective.

### Funding For Low-Income Energy Efficiency Customers

The Compact energy efficient programs offer three programs to low-income customers: one for single family units, one for multi-family units, and one for new construction. These programs have been designed by LEAN, and are being implemented by a number of Massachusetts electric companies.

The amount of funding dedicated to these low-income programs is based on the requirements of the Electric Utility Restructuring Act. As described in Section 2.4, the total low-income budget was determined by multiplying projected 2001 electricity sales to the Compact's customers by 0.25 \$/MWh. This amount of funding is higher than 20 percent of the residential programs budgets.

As indicated in Table 2.2, low-income programs will receive \$233,307 of funding for the half-year 2001, representing roughly 12 percent of the total budget for the Compact's energy efficiency programs in that year. In addition, low-income customers will be eligible for some of the measures offered through the Residential Products and Services Program. We have not yet estimated the amount of measures likely to be provided to low-income customers through this program.

## **Consistency With The Priority-Setting Goals**

The Compact energy efficiency programs strike an appropriate balance among all of the priority-setting goals. In fact, the Compact's overall Energy Efficiency Plan contains a comprehensive portfolio of programs that achieves each of the priority-setting goals to a high degree. None of the priority-setting goals has been sacrificed in a significant way in order to emphasize any other goal.

### 1. Equitable Allocation Among Customer Classes

The Compact programs and budgets are specifically designed to be equitably allocated among all customer classes. First, the programs are designed to make energy efficiency

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services available to all customer types (low-income in single and multi-family units, low-income new construction, low- and moderate-use residential, high-use residential, residential new construction, small, medium and large C/I, government agencies, and C/I new construction).

Second, the energy efficiency budgets are allocated to the various programs in such a way as to achieve equity across the different customer types. As described in Section 2.4, the funding allocated to the residential and C/I budgets is based on these customer classes' shares of total annual electricity sales. The level of funding to these two customer classes is therefore directly tied to the amount of money contributed by each class. Furthermore, the funding levels for the programs within each of these customer classes was roughly based on contributions from the different customers served by the programs. For example, electricity sales to small C/I customers are significantly larger than sales to medium and large customers, so the Small C/I Customer Program was allocated significantly more funding than the Medium and Large C/I Customer Program.

In addition, the Compact is allocating energy efficiency budgets to each town according to the amount of efficiency money contributed by the town. Consequently, our allocation will be more equitable than those of electric distribution companies.

## 2. Adequate Support for Capturing Lost Opportunities

The Compact's programs are specifically designed to capture lost opportunities, in a number of ways. New construction programs represent one of the most effective means of capturing lost opportunities, because it is significantly less expensive to adopt efficiency measures at the time of construction than as a retrofit to an existing building. Consequently, the Compact offers new construction programs, not only to residential and commercial customers, but also to low-income customers. Similarly, the C/I New Construction Program provides incentives to adopt efficiency measures whenever a business undertakes a major renovation or remodeling effort.

Another important means of capturing lost opportunities is by influencing a customer's purchasing decision when outdated equipment is retired and new equipment is purchased. Many of our programs – especially the Products and Services Programs – are designed to affect customers at the point of purchase.

## 3. Due Emphasis to Statewide and Regional Market Transformation

The Compact intends to participate in relevant statewide and regional market transformation initiatives. This EEP includes the market transformation programs offered through NEEP and promoted by the US DOE. In addition, our new construction programs are specifically designed to help transform the residential and C/I construction industries, by working with home builders, architects, and various construction trade allies in order to promote efficient construction practices over the long-term. New construction programs are offered separately for low-income, residential, and C/I construction industries, because of the unique characteristics and market barriers facing these different industries.

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#### 4. Utilize Competitive Procurement Practices

Unlike the distribution companies in Massachusetts, the Compact does not have internal staff to implement its energy efficiency programs. Consequently, all of the program activities -- administration, implementation, monitoring and evaluation, legal and technical services -- will be conducted by contractors outside of the Compact.

Each of the contractors hired by the Compact to administer and implement the energy efficiency programs will be selected through competitive bidding processes. These competitive processes will be open to all interested parties, including Massachusetts distribution companies, energy service companies, companies supplying generation services to the Compact.

The Compact intends to hire one full-time staff person to oversee the work of the Management Contractor, and to act as a liaison between the Governing Board and the Management Contractor. However, this person will be funded by Barnstable County, and not by the energy efficiency funds raised through ratepayers.

#### 5. Facilitate the Development of a Competitive Market for Energy Efficiency

The Compact will rely entirely upon competitive energy service companies to deliver its energy efficiency programs. These companies, in turn, rely upon a variety of other competitive companies that manufacture and distribute energy efficiency technologies. Combined, these businesses represent the core of the competitive market for energy efficiency. The Compact's energy efficiency programs will offer these companies opportunities to increase their activities, and will therefore facilitate the development of the competitive market for energy efficiency. Furthermore, the Compact's energy efficiency programs will not hinder the development of the competitive energy efficiency market.

#### 6. Balance Short- and Long-Run Savings From Energy Efficiency Programs

As discussed during the DOER's process to develop the energy efficiency goals, the primary purpose of this goal is to ensure that there is an appropriate balance between market transformation-type programs that might have small short-run savings, and more conventional programs that are designed to save energy immediately.

The Compact's programs clearly achieve this goal. The market transformation programs are specifically designed to result in direct customer participation, and therefore direct energy savings in the short-run as well as the long-run. This is also true for the other Compact programs.

#### 7. Optimize the Cost-Effectiveness of Energy Efficiency Programs

As discussed during the DOER's process to develop the energy efficiency goals, the primary purpose of this goal is to encourage program administrators to design highly cost-effective programs. In addition, this goal is meant to encourage program administrators to balance the objective of increasing cost-effectiveness with the other priority-setting

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goals. Hence, this goal encourages program administrators to “optimize” cost-effectiveness, but not necessarily to “maximize” it.

The Compact’s energy efficiency programs clearly achieve this goal. As indicated in Tables 2.4 and 2.5, the Compact’s energy efficiency programs are all cost-effective. And as indicated in the previous paragraphs, the Compact’s programs also achieve all of the other priority-setting goals.

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## 9. Phase II of the Energy Efficiency Plan

The Compact intends to implement a second phase of the Energy Efficiency Plan to augment those activities described in this report. During Phase II, the Compact will build upon the success of Phase I in three ways. First, the Compact will examine new opportunities for energy efficiency measures and savings, beyond those identified in the programs described above. These innovations will be based upon research and analysis to identify specific programs and measures that have proven successful in other communities, states and regions. They will build upon the evolving market transformation efforts being undertaken by the Department of Energy, NEEP, the Consortium for Energy Efficiency, and others.

Second, the Compact will expand upon the peak-shaving initiatives that are begun in Phase I. The Stop Peaking educational program will be expanded to include pilot programs to investigate the potential for combining time-of-use rates with peak shaving technologies. The Compact will identify 20 residential consumers and 20 C/I consumers to participate in this pilot. The peak shaving technologies could include, for example, time-of-use meters; set-back thermostats; timers for air conditioning and water heating appliances; and radio, telephone or Internet-controlled timers. Customers would also be educated about the electricity bill savings that can be enjoyed by combining time-of-use rates with peak-shaving technologies and peak-shaving behavioral modifications.

Third, as a separate program, the Compact will conduct research, education and develop opportunities for distributed generation options – small-scale generation technologies that can be deployed at many locations throughout an electric distribution system. Distributed generation technologies can improve reliability, reduce the system load factor, improve power quality, reduce transmission and distribution upgrade costs, and reduce the overall cost of power supply to customers. The Compact will focus on clean and efficient distributed generation facilities. The Compact will use a distributed resources planning approach, whereby distributed generation options will be considered along with the energy efficiency programs in an integrated fashion.

The Compact will seek additional sources of funding to support the Phase II initiatives. Likely sources of funding include: the Massachusetts Renewable Energy Trust Fund, Compact member towns, state and federal grants, energy service companies, power suppliers, and customers participating in the programs.

The Phase II initiatives will build upon successful energy efficiency programs and increase the positive impacts for individuals and the region. The Phase II efforts will allow the Compact to identify those energy efficiency measures that will not only reduce individual consumer bills, but can also reduce the per-unit cost of purchasing energy through load factor improvements. They will allow the Compact to integrate the various services and help to advance market transformation on a broad front.

The energy efficiency portions of Phase II would be developed in consultation with DOER and to the extent required, be submitted to the Department for approval as amendments to this Energy Efficiency Plan.

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