Applied Public Policy Research
APPRISE
Institute for Study and Evaluation

MEMO

DATE: October 12, 2006 (Revision #2)

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SUBJECT: Need for and Design of a Fossil Fuel Energy Efficiency Program

Energy Usage in Vermont

In 2002, Vermont consumed 106.4 trillion Btu of energy in the residential, commercial, and industrial sectors.[1] In thinking about how to develop programs to address the green house gas emissions associated with energy consumption, it is useful to understand the types of energy consumed by end users and the distribution of energy consumption across end user segments.

- About 60% of the energy was consumed by end users as electricity and 40% was consumed directly as fossil fuels (e.g., fuel oil, natural gas, and LPG).
- About 44% of the energy was consumed in the residential sector, 30% in the commercial sector, and 26% in the industrial sector.
- Electricity represented 69% of consumption in the commercial sector, 63% in the industrial sector, but only 48% in the residential sector.
- The use of electricity was evenly spilt across end use sectors, 37% residential, 35% commercial, and 28% industrial.
- In contrast, 55% of fossil fuels were used in the residential sector, compared to 23% in the commercial sector and 22% in the industrial sector.

These statistics suggest that programs designed for mitigation of green house gases might differ in important ways between electricity and fossil fuels – with fossil fuel remediation programs more directly focused on the residential sector than electric remediation programs.

Another important factor to consider in program design is the number of market actors and the concentration of savings opportunities. While usage of electricity is evenly split across end use sectors, there are fewer market actors in the commercial and industrial sectors that use more electricity on average than households. Moreover, in commercial and industrial settings, there are likely to be one or more end uses that represent a significant share of energy usage and good targets for energy savings measures. In the residential sector, electric uses are more disperse, and more subject to idiosyncratic usage patterns by occupants. In most cases, electric usage reduction programs achieve average savings of about 5% of baseline usage. One

[1] 2002 is the latest year for which comprehensive data at the state level is reported by the U.S. EIA.

important exception was the Ohio EPP program that targeted high user households and achieved savings of about 1,700 kWh (12% of baseload).

In contrast, the energy savings opportunities with respect to the use of fossil fuels in the residential sector are easy to predict. Over 95% of usage is concentrated on space heating and water heating. Homes exceeding a certain usage threshold invariably have excellent savings opportunities for space heating and/or water heating measures. There are a limited number of measures that are likely to be needed to address the usage problem. Residential fossil fuel usage reduction programs tend to achieve savings of between 10% and 25% of baseline usage. The higher saving programs target the highest usage housing units and focus on delivery of a comprehensive set of measures.

Vermont Energy Efficiency Programs

Vermont has a number of energy programs that make important contributions to reductions in electricity usage in all sectors and reductions of fossil fuel usage among low-income households. However, Vermont is missing important opportunities for energy savings because there is a program gap with respect to fossil fuel usage by households that are not low income and fossil fuel usage in the commercial and industrial end use sectors. Current programs include:

- Electric Savings Program - $30 million in electric ratepayer funds for electricity efficiency measures in 2007, including a set-aside for low-income households and low-income multifamily housing ($2.25 million in 2005).

- Weatherization Trust Fund - $5.7 million from Vermont for weatherization of low-income households.

- DOE WAP Funds - $1.4 million from the federal government for weatherization of low-income households.

The Electric Savings Program funds support spending for electric efficiency measures in the residential, commercial, and industrial sectors. The program initiatives include incentives for equipment efficiency upgrades, building and system design consultation, and other energy market transformation activities.

The Weatherization Trust Fund, DOE WAP funds, and a share of Electric Savings Program funds are targeted explicitly to low-income households. Data published by HHS shows that in 2004, about 72,000 of Vermont's 240,000 households (30%) were eligible for these programs. Currently, the Efficiency Vermont electric efficiency measures are delivered to households in conjunction with weatherization services. The joint delivery of these services should represent a significant savings compared to a stand-alone residential electric efficiency program.

Opportunities for Vermont Energy Efficiency Programs

Fossil fuel efficiency programs represent the most important gap in Vermont's portfolio of energy efficiency programs. While fossil fuels represent about 40% of end user consumption in Vermont, current fossil fuel energy efficiency programs cover only about 16.5% of fossil fuel usage. (Low-income residential end users represent about 16.5% of Vermont's total fossil fuel

usage.) Other residential sector users, as well as commercial and industrial uses of fossil fuels are not covered by the existing programs.

The introduction of a residential fossil fuel energy efficiency program is a particularly attractive option for Vermont. Building on the existing knowledge and expertise available from experiences with low-income weatherization field, Vermont could build an effective infrastructure for serving all residential households with the potential to attain significant fossil fuel energy savings. In addition, in the process of delivering fossil fuel efficiency services, there would be the opportunity for the delivery of targeted electric efficiency measures with funding form Efficiency Vermont.

For the commercial and industrial end use sectors, it is likely that fossil fuel efficiency measures could be integrated with the existing Efficiency Vermont program infrastructure. Joint delivery of program services would be likely to reduce program outreach and service delivery costs, increase the value of the program to customers and thereby increase program participation, and achieve the greatest levels of green house gas remediation.

A Vision for Vermont's Energy Efficiency Program

There are at least three key ways in which Vermont's energy efficiency programs could be improved to provide increased efficiencies in service delivery and more comprehensive energy services.

- Provide energy efficiency services targeted at fossil fuel usage reduction in residential households (non low-income) and in the commercial and industrial sector.

- Expand Efficiency Vermont to increase services for residential customers.

- Create a more efficient program administration for residential energy efficiency services.

Each of these three changes could be addressed on its own. However, a unified approach to these issues could provide the greatest opportunities for efficiencies and synergies, and result in a truly comprehensive energy efficiency program. Rather than presenting customers with a limited set of opportunities, as the individual programs currently do, a single program offering, a Residential and Commercial Energy Efficiency Initiative, could facilitate the delivery of a complete set of cost-effective energy efficiency measures. To achieve this reality, Vermont would need to select one program administrator that could effectively integrate the three funding streams. Efficiency Vermont, the current administrator of the largest pool of energy efficiency funding, the Electric Savings Program, may have the capability and be the logical entity to provide this central administration.

With Efficiency Vermont as the administrator of the Electric Savings Program, the Weatherization Trust Fund Program, and the supplemental fossil fuel energy efficiency funding, they could develop an efficiency program based on the Home Performance with Energy Star model. Such a program could delivery electric and fossil fuel energy efficiency measures to new and existing buildings. On a sliding scale, the program may be able to delivery the following services:

- Fully funded fuel-neutral weatherization for low-income households. These households could also be offered the opportunity to purchase additional home performance services

that fell outside the scope of the weatherization budget. The low-income services would be funded by the Weatherization Trust Fund for fossil fuel uses, and by the Electric Savings Program for electric uses.

- Partially funded fuel-neutral weatherization for low-income households with income above 150% of the Federal Poverty Level (FPL). Weatherization services could be offered on a sliding scale basis for these households, with lower assistance available for households at higher poverty levels, up to a limit of 250% or 300% of the FPL. The Weatherization Trust Fund was initially established to expand the Weatherization Assistance Program (WAP) for households with income below 150% of the poverty level. However, in the past four years fuel prices have doubled, increasing the funding in the Weatherization Trust Fund, and increasing the need for weatherization services among slightly higher income households. Therefore, there may be the potential to use these funds, along with Electric Savings Program funds, to serve households with income slightly above the WAP standard.

- A free or subsidized energy audit and energy incentives, provided in the form of rebates or low interest loans, for households who undertake energy efficiency improvements. These audits and incentives could be funded by a new fossil fuel funding stream and the Electric Savings Program.

- A free or subsidized energy audit and energy incentives, provided in the form of rebates or low interest loans, for commercial and industrial customers who undertake energy efficiency improvements. These audits and incentives could also be funded by a new fossil fuel funding stream and the Electric Savings program.

For each building, participant costs would be determined by the eligibility of the participant for low-income subsidies, the eligibility of the installed measures for energy efficiency incentives, and the eligibility of the design services for incentives. By breaking down the barriers between traditional low-income weatherization and the newer concepts of home performance contracting, low-income households would be able to pay for supplements to the typical weatherization offering.

While community-based organizations would continue to provide WAP services, under administration by the Vermont Office of Economic Opportunity, they could choose to provide additional services to low-income and even non low-income households and non residential buildings through the comprehensive program managed by Efficiency Vermont. Community-based organizations and independent contractors could compete to provide program services, providing ratepayers and program participants with the most beneficial and cost-effective services.

The introduction of such a comprehensive Residential and Commercial Energy Efficiency Initiative with new funding presents unique opportunities to the entire community. Households and business can improve the quality of their buildings. Community-based organizations and independent contractors alike can expand their service offerings and grow their business. Services can be provided in an integrated manner to improve system efficiencies and increase benefits to participating households and businesses.

Research for Program Design

The key to effective energy efficiency program design is to identify the best energy efficiency opportunities, assess the attitudes and interest of targeted customers, characterize the existing infrastructure available to address those opportunities, develop a strategy for attracting program participants and building program infrastructure. We recommend that you conduct the following types of research to assess the most effective program design strategies.

- Energy usage distribution – Use data sources to examine the distribution of fossil fuel energy use among the targeted residential, commercial, and industrial populations.

- Review other programs – Fossil fuel programs (mainly natural gas) have been implemented in other jurisdictions. Examine reports from those programs to assess what program designs have been most effective in taking advantage of market potential.

- Characterize existing infrastructure and expertise – Work with current service providers to develop an understanding of what external resources (contractors and vendors) they use in the delivery of low-income programs. Assess the potential demand for contracting services based on different levels of program investment.

- Environmental program impact – Document the expected environmental benefits from targeted levels of program service delivery.

- Economic program impact – Document the expected economic benefits from the targeted levels of program service delivery.[2]

This research will contribute to the development of optimal levels of fossil fuel program investment by sector and to the identification of the most effective strategies for program implementation. Using this information, we could work with VEIC to outline a comprehensive program design that specifies possible relationships among Efficiency Vermont, the low-income weatherization programs, and the propose Fossil Fuel Efficiency Program.

[2] An economic analysis of the Ohio EPP program conducted by APPRISE documented supplemental economic benefits of 320 jobs and about $1 million resulting from the increase in the share of expenditures within Ohio associated with spending on energy efficiency services.