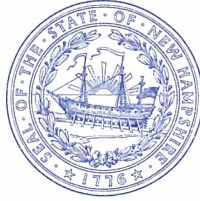


THE STATE OF NEW HAMPSHIRE

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April 23, 2013

Debra Howland, Executive Director
New Hampshire Public Utilities Commission
21 South Fruit Street, Suite 10
Concord, New Hampshire 03301



Re: DE 10-188 and DE 12-262, HPwES Ancillary Electric Savings and Air
Conditioning Savings Research

Dear Ms. Howland:

Background:

In January 2009, docket DE 08-120, the Commission approved the Home Performance with Energy Star (HPwES) fuel blind pilot project that delivers weatherization services to residential customers who heat their homes with oil, natural gas or propane. In its approval, the Commission stated that there could be significant electric savings from the program.¹

Subsequently, in August 2012, docket DE 10-188, the Commission conditionally approved the continuation of the HPwES program, subject to clarification of expected electric savings. Also, the Commission directed the parties and Staff to study the drivers of the increasing air conditioning load in both residential and C&I customer classes and to develop cost effective energy efficiency programs to reduce this load. Finally, the Commission encouraged the utilities to include additional measures or programs that target peak demand in the 2013-2014 CORE program filing. As data becomes available on these issues, the Commission indicated that the HPwES program will be revisited.²

¹ "Although energy efficiency measures such as improved insulation and air sealing may primarily save non-electric fuels in non-electrically heated buildings, there can often be significant electric savings from such measures as well." Order No. 24,930, page 19, DE 08-120, January 5, 2009.

² "Having reviewed the testimony of the parties and Staff, and the evidence presented in three days of hearings, we find that the HPwES program should be continued and included in the 2013-2014 CORE program filings. Because, there are a number of issues which need to be resolved, as discussed below, our approval of the continued HPwES

Responses to Issues Raised by the Commission:

The CADMUS report (attached) addresses the issues raised by the Commission. The Commission noted that PSNH and UES had not sufficiently quantified the ancillary electric savings from non-electric energy efficiency measures. Also, the Commission noted that non-electric savings such as those realized from weatherization do lead to electric savings and that New Hampshire reaches its peak electric usage in the summer. Given these circumstances, the Commission directed the parties and Staff to further research ancillary electric savings and the drivers of the increasing air conditioning load (Order No. 25,402, page 24-25). PSNH, in conjunction with Staff and the interested parties, agreed on the selection of CADMUS to provide this additional research. CADMUS reviewed New Hampshire energy efficiency programs, historical electric load data, data from surveys conducted for utility customers and New Hampshire residents, data from previous New Hampshire research studies and evaluations³ and additional data from CADMUS' work in other regions to respond to the Commission's directive. The analysis is extensive and informative. The following summary captures some of the key points presented in the report.

1. Ancillary Electric kWh savings attributable to weatherization (Order 25,402, p. 25).

CADMUS determined the estimated average annual electric kWh savings impacts from weatherization as follows (Executive Summary, Table E-1, page xi; Table 19, p. 59):

- Heating fans and pumps 35 kWh per year
- Cooling fans and pumps 39 kWh per year

The CADMUS report shows the estimated impacts of weatherization on the heating and cooling equipment types (including both central air and room air conditioning equipment), using updated values for equipment wattage and heating system types in New Hampshire (p. xi, xiv). CADMUS' analysis indicates that load reductions caused by weatherization measures may have ancillary electric impacts. Ancillary impacts are due to reduced runtime of ancillary electric heating equipment such as furnace fans and boiler pumps; and, reduced runtime of ancillary electric cooling equipment such as air handling fans or pumps for central air conditioning systems or ground and water source systems, along with reduced runtime of local cooling equipment such as ceiling and floor fans (Table 12, p. 49).

program is conditional and will be revisited as more program data becomes available." Order No. 25,402, page 21, DE 10-188, August 23, 2012.

³ CADMUS provided an impact and process evaluation report on the HPwES program in June, 2011.

2. Drivers of increasing air conditioning load in both residential and C&I customer classes and cost effective energy efficiency programs to reduce this load (Order No. 25,402, p. 25).

Residential Drivers:

- CADMUS analysis of cooling loads shows that NH summer residential sector peak load occurs after the ISO FCM summer on-peak period and is driven by non-cooling loads (ref. Figure E-1, p. iv-v and p. 23, 26).
- The highest loads in the residential sector occur between 6:00 p.m. and 10:00 p.m. and this peak, late in the day, is driven by non-weather related loads, including lighting and appliances (p. 22).
- CADMUS analysis of cooling loads in the residential sector revealed that the residential sector contributes only a small amount to the summer on-peak load (21 percent), but may be a large contributor to load during peak days (p. 22 and Figure 21, p. 23).
- Heating and cooling measures represent only 10% of the maximum achievable cost effective residential electric savings potential by end use⁴; but likely represents a higher percentage of the demand reduction potential (p. 27-28).
- Residential cooling consumption is approximately 6 percent of annual residential energy consumption (Figure 21, p. 23).
- Only 8 percent of households are in the market for new air-conditioning equipment each year (p. 30).

C&I Drivers:

- CADMUS analysis of cooling loads shows that C&I sector electric demand during summer weekdays peaks just before the ISO-FCM on-peak period (p. 24).
- The highest loads in the C&I sector occur between 11:00 a.m. and 2:00 p.m. and this early peak is driven by building cooling loads (p. 24 and p. 38).
- During the ISO-NE summer on-peak hours, the weather-related (cooling) component of the summer C&I sector load contributes only a small amount (17%) to the summer on-peak load.
- With respect to cooling load in the C&I sector, the CADMUS analysis indicates that the C&I cooling consumption is approximately 5 percent of annual C&I energy consumption (Figure 22, p. 24).

⁴ Data from GDS Report, *Additional Opportunities for Energy Efficiency in New Hampshire*, January 2009, page 11.

- It is expected that the C&I cooling market is saturated (i.e., those facilities without cooling equipment do not require cooling). (p. 24)

With respect to cost-effective energy efficiency measures requested by the Commission, please refer to the following section.

3. *Additional measures or programs that target peak demand in the 2013-2014 CORE program filing (Order No. 25,402, p. 25)*

CADMUS provides an extensive list of measures to reduce load and peak demand in the Residential and C&I sectors. The list of measures is split between cooling and non-cooling related measures. Please see Attachment A.

Summary:

In Order No. 25,402, the Commission gave conditional approval to the HPwES program, noting that it would revisit its decision when more information on the above three issues becomes available. The Commission order asked three questions and the CADMUS report provides responses. Further, at our next Quarterly Core Team meeting on June 10, 2013, Staff will solicit comments on the CADMUS report from the utilities and other interested parties; and, we will provide this additional feedback to the Commission at that time.

Sincerely,

A handwritten signature in cursive script that reads "Marcia A. Brown/db".

Marcia A. Brown

Staff Attorney

Copies: Service List