



To: Energy Efficiency Board
From: Kim Oswald, on Behalf of the EEB Evaluation Committee
Date: June 14, 2011
RE: Evaluation Committee Status Report – for June Meeting

DPUC COMPLIANCE ISSUES - COMPLETE

In Docket 10-10-03, the Departments made several evaluation-related orders.

- Develop data collection needs with ISE by 3/15. Complete.
- Develop written protocols for evaluation. Complete
- Provide a study using billing analysis and reconcile to engineering-based study.

The existing Small Business project will be expanded to meet this requirement; adding the billing analysis component and also providing for metering additional measure types beyond the air-conditioning and refrigeration measures planned. The cost increase should be approximately \$100,000

CONTRACTOR POOL – INFRASTRUCTURE DEVELOPMENT

As has recently been implemented in MA, the evaluation group will establish a set of qualified and cost-competitive Contractors to perform all evaluation studies in each research areas:

- Residential Retrofit and Retail Products
- Res New Construction and Emerging Measures
- Large C&I
- Small C&I
- Cross-Cutting Studies

The Residential Retrofit and Retail Products RFQ was released on May 5 and responses provided on June 6. Two proposals were submitted. For Res New Construction and Emerging Measures, the equivalent dates were May 13 and June 10. One proposal was submitted. Responses for the Cross-Cutting Studies research area are due June 17. Seven Contractor teams have indicated that they will respond. The Small C&I RFQ was released on June 13, with results due July 11. The Large C&I RFQ is under development.

The proposals are being delivered as 2 volumes. The first is a commercial volume that provides Team identification and experience, rates and guarantees of those rates, assurances, contract issues, etc. The second volume provides technical detail on how the Team conceives of and will conduct the studies that have been requested. The technical volumes have been provided to the Companies and the Residential Technical Consultant for their assessment. Then we will look at how the commercial proposals squares with the technical.

RESIDENTIAL STUDIES – THOSE NOT IN CONTRACTOR POOL

2010 HOME ENERGY SOLUTIONS IMPACT EVALUATION – CT – COMPLETED

On May 11, the DPUC held a Technical Meeting in conjunction with Nexant’s presentation of the HES report. Following that meeting, the Department presented interrogatories to examine the results more closely. The hearing to consider how the Companies will incorporate the results of the HES report will be held on June 15.

RESIDENTIAL BEHAVIORAL PILOT PROGRAM/ C&I BEHAVIOR PROGRAM (CL&P PROJECT CONTINUED FROM 2010, UI STARTING IN 2011)

Both of these studies have suffered significant delays.

CL&P

For this study, the goals are to determine:

- Savings that accrue to customers over the course of the pilot
- What actions customers take to achieve those savings
- Types of messages and ways of communicating those messages that are most likely to result in significant savings
- Whether customers continue social marketing after they are no longer reminded to do so
- Extent customers continue behavioral actions the program induced over time without reminders

Data collection has been very challenging for this study. At this point, however, the system for transfer of data between NMR and CL&P is working flawlessly. The initial participant identification data were provided in late February and billing data at the end of March. Initial billing analysis is proceeding. Because the winter season data were limited by the late start to the program, no savings have been estimated to date. However, the unusually long winter offers the opportunity to bring additional data into the winter season and better reflect the effects of customer receipt of reports. The larger problem has been the refusal of OPower to supply data required to meet the study objectives. Some of OPower’s data may be commercially limited, but the evaluation Contractor has requested no data tied to individual households. In addition, the individual-household data were provided for another similar evaluation that one of the NMR team members led. Additional program-specific data have also been refused. CL&P facilitated a discussion to resolve these data issues on May 31, but no additional data have been provided since.

Timeline	Original Date	New Due Date	Date Completed	Notes
Initial Data Acquired	2/14 (8 weeks after signing)		Data requests complete 12/27 And 1/24	Initial data received; billing data from CL&P on 3/28; Awaiting data from OPower.
Sample Selection	2/ 28 (10 weeks after signing)	3/11		CL&P data delivery delay
Process Evaluation Protocols	2/28 (10 weeks after signing)		2/28 and 3/25	Change in program activity require revision in protocols
Data Collection Billing Data	January start date	March 28	Baseline data collection initiated April 7; difficulties scheduling interviews moved those to the week of April 11th	
Baseline Surveys			May 4	Began week of April 11
Staff and OPower Interviews			4-14 CL&P Staff 4-11 OPower	Waiting responses to clarifying questions from CL&P

Timeline	Original Date	New Due Date	Date Completed	Notes
Data analysis	Winter report: 4/1	Winter report: 5/1	6-1	Delay in project start date caused initial delay. Current delay is to allow for additional billing analysis.
Interim Report		7-1		

UNITED ILLUMINATING

The original expectation was for a single evaluation of both UI and CL&P's programs. However, UI decided to pursue a different model for their Pilot. UI's main evaluation goals are to determine:

- What messages and message delivery vehicles, alone and in combination, are most effective in producing energy efficiency actions among participants? Ease of access and use of the web interface;
- Changes in knowledge, attitudes, and reported actions among program participants. Barriers to taking additional (more substantial) energy efficiency behaviors? The extent to which participation in the Pilot induces participation in other CEEF programs
- Participant satisfaction with the overall program and specific aspects of the program?
- Frequency and reasons for program drop-outs, including passive dropouts

NMR provided the work plan on January 12 and UI approved going forward with it on the 13th. After receipt of a Purchase order late in March, a kick-off meeting was held on April 6th. However, after receipt of the P.O., UI provided new Terms and a Professional Services Agreement that have delayed development of a firm Contract. The countersigned contract was provided on June 13. The Baseline survey will begin shortly.

RESIDENTIAL NEW CONSTRUCTION BASELINE – CONTINUED FROM 2010

The Residential New Construction Baseline project is being completed in cooperation with an effort begun in Massachusetts. While there are many common tasks across the various groups, each entity is able to select those activities important to their states. CT is focusing on an assessment of the extent to which:

- New residential construction meets current building codes;
- Customers seek out opportunities to select efficient systems; and
- Whether builders are making those opportunities available.

MA selected a team made up of KEMA and NMR to conduct this study. The CT Scope of Work was developed and accepted on February 3rd. Since CT was able to establish our study parameters more quickly than other states involved, Connecticut was set to begin prior to other the states. In the February report, I reported to the Board that the Companies were putting together purchase orders to support the project. The request for them to do so went out on February 4th. Both Companies' purchase orders are now in. However, UI has not signed a contract with the team due to concerns regarding the PSA and employee background checks.

COMMERCIAL/INDUSTRIAL STUDIES

ENERGY CONSCIOUS BLUEPRINT IMPACT AND PROCESS STUDY- CONTINUED FROM 2010

Global Energy Partners, LLC (with their subcontractor, Lime Energy) was chosen to complete the study the ECB study. In order to quantify the benefits of efficient measures installed in C&I facilities through the ECB program. The program benefits include avoided capacity costs resulting from reduced electric demand during peak

hours and avoided energy costs resulting from energy savings during seasonal and on/off-peak periods. In addition to the impact study, changes in the program and in the market made plain the need for a process evaluation that will examine customer benefits realized, comprehensiveness and depth of installations made with and beyond program incentives and effects of individual measures on program performance.

An initial draft of the summer temperature-sensitive measures was supplied as scheduled in December. A Draft Final report was provided on May 20 and was sent to the Companies and the EEB C&I Technical Consultant on the 21st. However, a miscommunication between CL&P and GEP resulted in some important data not reaching GEP. For that reason, additional analysis will be required.

Event/Deliverable	Due Date	New Due Date	Date Complete	Reasons for Delay/Notes
Phase 1 Data Analysis and Report	11/01	12/01	02/04 (draft)	December version needed major revision and reanalysis.
Data Collection (winter)	01/01		01/31	Difficulty accessing some sites
Phase 2 Data Analysis	03/01		03/17	
Draft Final Report	05/15		04/15	
Draft Final available for Review	05/20		05/20	Sent to reviewers 5/21

IMPACT EVALUATION OF THE RETRO-COMMISSIONING/O&M SERVICES PROGRAM – BSC INITIAL ASSESSMENT

Michaels Energy has been retained to conduct this evaluation. The study will provide savings data in order to quantify the benefits of efficient measures and processes developed in commercial and industrial (C&I) facilities through the RCx/O&M Services (O&M) program. The benefits include avoided capacity and energy costs resulting from energy savings during seasonal and on/off-peak periods. In addition, because operations adjustments may not be maintained, persistence is a particular concern for this study. Beyond the impacts of the current program, it is hoped that this study can inform the evolution of the program through the Business Sustainability Challenge.

For the Business Sustainability Challenge, this project will examine the impacts made and the needs that corporations have to develop a culture of efficiency improvements. The study will use interview approaches to determine the extent to which participants have established attributes and practices that provide for culture change and long-run savings. The extent to which participating companies have established savings metrics and completed benchmark analysis is an important component of the study. Additionally, the study will assess what customers would like to see in this program to allow Program Administrators to fine-tune program offerings to increase savings, serve customers and expand the program cost effectively.

Contracting issues led to a late start to the project, delaying winter seasonal data collection until 2011-2012. However, the project is now pushing towards extensive monitoring for the summer season. Michaels is currently attempting to collect data from the Companies. For CL&P in particular, much program data are maintained in paper files. So the Contractor is in CT scanning the individual files for analysis. However, of 44 projects in the sample, CL&P has not yet been able to locate 17 of the files, representing 22% of the sample savings. CL&P continues to search for the files. To date, UI hasn't responded with any data concerning their

O&M program or BSC. UI's RCx data is complete. These data issues may result in serious loss of precision in the study results.

Customer recruitment begins next week.

STUDIES NOT YET INITIATED PENDING CONTRACTOR SELECTION

RESIDENTIAL STUDIES – IN CONTRACTOR POOL

1. RESIDENTIAL RETROFIT AND RETAIL PRODUCTS

RESIDENTIAL MEASURE LIFE AND PERSISTENCE

This study is intended to examine measure life (time until failure) and persistence (time still in service) for measures installed in HES and HES Income-Eligible. The most recent study on this topic was undertaken in 2007. Beyond the age of the existing information, the need for this study was made evident with the completion of the 2010 Low Income study. That study found evidence that existing estimates developed for HES poorly matched what was found in limited income homes.

RESIDENTIAL LIGHTING SATURATION

Completion of this study is required and will be initiated as soon as possible. This study will examine the numbers and locations of common and specialty efficient lighting products with an aim to determine the extent to which substantial direct intervention in the market continues to be needed.

EFFICIENCY OPPORTUNITIES IN MULTIFAMILY

This market assessment and feasibility study will assess ways to reach and expand depth of multifamily efficiency options. The study will include site visits to assess common apartment configurations and efficient equipment saturation. The study will also examine barriers to implementation including landlord/tenant conflicts and payback requirements.

2. RESIDENTIAL NEW CONSTRUCTION/EMERGING TECHNOLOGIES

GROUND SOURCE HEAT PUMP STUDY

CL&P estimates that they've helped install, or have in the pipeline, upwards of a 1,000 units; UI has a lesser number. This study will entail working with CCEF to do an impact analysis and a market and technology assessment, including more detailed lifecycle cost and carbon impact analyses.

EARLY REPLACEMENT OF GAS WATER HEATER/ FEASIBILITY OF ON-DEMAND UNITS

This study will be a market assessment study to examine the feasibility and likely cost efficiency of encouraging early replacement of inefficient gas water heaters and especially the benefits and costs of replacing these units with on-demand water heaters.

C&I STUDIES – IN THE CONTRACTOR POOL

3. LARGE C&I

C&I LIGHTING MARKET

This study is a market study to examine where remaining opportunities exist for efficient lighting. In addition to examining particular technologies, the study will examine the extent to which program barriers affect capture of these opportunities.

4. SMALL C&I

SMALL BUSINESS AIR CONDITIONING AND REFRIGERATION IMPACT – BILLING ANALYSIS

The Small Business program impact evaluation (completed in 2009) provided good overall impact values and collected large amounts of information on lighting and lighting controls. However, additional information on summer impacts from air-conditioning and refrigeration measures needs to be collected.

This study is the candidate for a full-program impact evaluation with both billing and metering activities as required by the DPUC; however, that scope is not in the current plan. We would have to add the billing analysis component and also provide for metering additional measure types beyond the air-conditioning and refrigeration measures planned. To accomplish this, the budget will probably need to be increased to approximately \$325,000.

5. CROSS CUTTING STUDIES

PSD ASSESSMENT

This project will provide a full and independent assessment of the 2011 PSD. Engineering analyses will examine both best practices from other jurisdictions and results from recent CT studies to recommend enhancements prior to the 2012 filing.

REGIONAL EM&V FORUM – 2010-2011

LOAD SHAPE ESTIMATION: C&I LIGHTING – CONTINUED FROM 2010

This project involves the creation of a spreadsheet tool that can be used by members of the Regional EM&V Forum to calculate and quantify the hourly savings of efficient lighting measures installed at Commercial and Industrial facilities. The tool will generate 8760 commercial/industrial lighting load shapes (largely from secondary sources). KEMA was selected to complete the study. Assembling the available data is nearly complete, and the spreadsheet tool design is being coordinated with the Unitary HVAC study. This project is proceeding at a slower pace than originally anticipated, but it is now at a point where the majority of the data has been collected, and KEMA can estimate the schedule for the next steps with more certainty. KEMA has completed almost 75% of the on-sites needed for the study. KEMA intends to complete up to 66 more projects, of which 10 are already in the pipeline. Draft results were provided on April 25. Draft report anticipated May 19 with a final report due on June 15.

LOAD SHAPE ESTIMATION: C&I UNITARY HVAC – CONTINUED FROM 2010

The objective of the study is the development of Unitary HVAC load factor data for every hour of the calendar year. The annual load shape data must also be adaptable to different program participant populations located within the service territories of Forum members; load shape data will be weather-normalized in order to provide

for the calculation of aggregate load shapes that reflect the weather conditions of different Program Administrator customer populations.

KEMA has collected and analyzed the data from its metering effort, and it has completed its modeling tasks. It also developed the spreadsheet tool which was tested by a small subset of the subcommittee (beta testers) late last year. Subcommittee review of the draft spreadsheet tool and report outline concluded on March 15. The HVAC Loadshape tool is expected to be available later this month. The Final Report was provided June 13 and can be found:

http://neep.org/uploads/EMV%20Forum/EMV%20Products/NEEP_HVAC_Load_Shape_Report_Final_June_10.pdf

C&I LIGHTING: MEASURE PERSISTENCE OF SAVINGS – CONTINUED FROM 2009/2010

The purpose of the project is to develop up-to-date impact parameters that describe lighting measure persistence, i.e. in place and operating over multiple (5+) years based on field and survey samples. The project will also develop equipment life estimates from secondary sources (manufacturer reports). The value of this project to sponsors is that commercial lighting is the largest source of savings for most EE providers in the region. Multi-year persistence lends itself to regional study because the research is difficult, expensive, and measures are consistent across locations. KEMA is providing this study.

KEMA developed the sample design for this project, based on data collected from EM&V Forum members in New England and New York. The results of this project are expected to deliver measure life estimates developed from models informed by primary data collected from programs that have been in existence and measures that have been installed for many years. The Draft Report was provided on June 14th.

COMMON EM&V METHODS AND SAVINGS ASSUMPTIONS

For 2011, development of common methods and savings assumptions will focus on emerging technologies and the programs offering them. The project's purpose is to provide consistent methods and savings assumptions (where appropriate) to support Forum states program planning and evaluation activities. The guidelines would add a second set of priority measures/program types to the Forum *EM&V Methods & Savings Assumptions Guidelines* adopted in May 2010, by recommending EM&V methods and savings algorithms and assumptions to estimate initial gross savings for a set of emerging technologies/program designs.

The project will focus on developing common EM&V methods for emerging technologies/program designs, such as solid state lighting/LEDs, heat pump water heaters, ductless mini-split heat pumps, consumer electronics, data centers, set top boxes, advanced power/smart strips and applications (e.g., for entertainment centers and offices). The project would also review existing and emerging program designs (e.g., whole building, comprehensive lighting design, including load control on customer side of the meter), the methods and tools being used (or developed) to evaluate savings, and recommend approaches to encourage consistency in EM&V practices and build awareness of available tools.

The effort will focus on examination of secondary data to identify gaps and develop deemed savings methods.

COMMON EE REPORTING TOOL

The overall purpose of this study is to address growing interest in consistent reporting of electric and natural gas energy-efficiency program savings, costs and emission impacts across states in the region to help inform multiple energy and environmental policies, including:

- Climate change goals and air quality emission reductions, and associated planning;
- State procurement policies, energy-efficiency savings and associated economic goals; and
- Regional energy planning and forecasting purposes.

In 2010, NMR produced a set of guidelines (available at <http://neep.org/uploads/EMV%20Forum/EMV%20Products/EMV%20Forum%20Statewide%20EE%20Reporting%20Guidelines%2012-30-10.pdf>). NEEP is incorporating revisions and definitions to the draft Guidelines with guidance from lead subcommittee members. Implementation of these guidelines will be the focus in 2011. A draft RFP for a 3rd party contractor competitive solicitation will be developed by April 14 for Forum participant review, with a planned April 21 subcommittee call to review comments. ISO/RTO staff have been invited to join the project subcommittee given interest and potential for building the reporting tool to provide EE data to support regional system planning needs.

INCREMENTAL COST STUDY - CONTINUED FROM 2010

The objective of this Project is to develop incremental cost assumptions for a variety of efficiency measures. Navigant is the contractor selected for this project. A kick-off meeting was held on October 8th.

Priority measures: NEEP and the Subcommittee have developed a list of priority natural gas measures on which to focus:

- Residential Gas Furnaces
- Residential Gas Boilers
- Commercial Gas Boilers
- Combination Heat/Hot Water
- Tankless/On-demand Water Heater
- Indirect Water Heaters

Electric measures have not yet been determined. Program-specific data has been requested from the Companies and supplied as was possible to Navigant. In mid-March, a measure characterization sheet on efficient boilers was provided to Forum participants. A draft report has been reviewed and is being revised.

EMERGING TECHNOLOGIES, MEASURES AND PROGRAM APPROACHES

The objective of this Project is to develop savings assumptions and/or EM&V methods to developing savings assumptions or estimates for a number of emerging efficiency measures and program approaches.

NEEP and the Subcommittee have developed a list of priority emerging technologies on which to focus. In addition, NEEP is interested in several program design approaches to promoting *system* efficiency improvements in buildings (typically involving multiple measures with interactive effects). Deemed savings may not be ideal or appropriate for such approaches. NEEP is seeking input on that issue as well as recommendations on best practices for EM&V approaches to estimating savings for such programs. We have identified the following as priority measures and program approaches:

Priority Measures

1. Solid state lighting/LEDs
 - Fixtures & screw-ins
 - Commercial & residential
2. Heat pump water heaters
3. Ductless mini-split air conditioners
4. Ductless mini-split heat pumps
5. Set top boxes
6. Advanced/smart power strips

Priority Program Approaches

1. Whole house (single family) retrofits
2. Multi-family whole building retrofits
3. Commercial lighting design

7. Commercial/Industrial commissioning
8. Biomass pellet boilers

An RFP has been developed and was released June 13.

IMPACT OF ENERGY EFFICIENCY ON CODES AND STANDARDS

This project is intended to accommodate several recent developments:

- The DPUC and other regional regulators ordered initiation of studies to examine development of a mechanism for attribution of savings from codes and standards;
- The precedent of regulatory approval that now exists in California to claim savings from codes and standards activities;
- Ability to leverage their significant progress in developing a mechanism to claim and attribute savings for residential building energy code compliance and/or improvements related to newly adopted stretch codes;
- Make regulatory staff and program administrators throughout the region aware (at a high level) of the codes and standards activities and attribution strategies.

The 2010 project with this title developed a Workshop to assist Forum members whose organizations are a) planning or considering programs and/or other activities that encourage improved codes, standards, and code compliance, and b) expecting to claim savings attributable to their activities.

For 2011, a more complex or comprehensive regional research project is being scoped by the Forum; Project continuation subject to DOE co-funding.