To: Energy Efficiency Board

From: Kim Oswald, on Behalf of the EEB Evaluation Committee

Date: April 9, 2011

RE: Evaluation Committee Status Report – for April Meeting

DPUC Compliance Issues

In Docket 10-10-03, the Departments made several evaluation-related orders. All will require immediate attention.

- 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

Draft RFPs for the Residential Retrofit and Retail Products and Res New Construction and Emerging Measures areas have been drafted. Cross-Cutting Studies' RFP is in progress.

Evaluation Planning

We're currently in the process of determining a longer-term set of evaluation studies in order to ensure that information is collected when needed. Additionally, we are finding a number of issues that cut across programs or will contribute to new programs that are not adequately captured in traditional program by program planning. Therefore, we are developing a set of studies that will capture information on particular programs, particular end-uses and particular markets over a three – five year period. Requests to identify evaluation needs have gone out the EEB Technical Consultants and to the Company evaluation staff. To date few suggestions have come in.

RESIDENTIAL STUDIES – NOT IN CONTRACTOR POOL

2010 HOME ENERGY SOLUTIONS IMPACT EVALUATION – CT – CONTINUED FROM 2010

This study examines the impacts of gas and electric measures installed in the HES program. Because the broad range of services for which different customer groups are eligible greatly complicates the analysis, the study focuses on a billing analysis, where the results parsed into measure types using engineering models. Nexant is the contractor for this evaluation.

The Final Report is completed. Presentation is currently scheduled for May 10, pending determination of location.

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. In the March report, I outlined procedural issues that slowed data collection, including meeting the needs of NU IT security that required development of new procedures. The initial participant identification data were provided in late February and billing data at the end of March. Initial billing analysis is proceeding, but the data required to meet the study objectives has not yet been made available.

Timeline	Original Date	New Due Date	Date Completed	Notes
Project Kickoff and Work Plan	Kickoff: 12/6/10 Draft Work Plan: 12/22/10		Kickoff: 12/6 Draft Work Plan: 12/21 Final Work Plan: 2/15	Work could not commence until contract signed and PO released on 12/20/2010
Sample Design	2/ 7 (7 weeks after signing)		Draft 12/21/10 Final 2/15	Design finalized after receipt of data from CL&P and OPOWER.
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	January start date	March for baseline survey and staff interviews		Baseline data collection initiated April 7; difficulties scheduling interviews moved those to the week of April 11th
Data analysis and Interim Reports	Winter: 4/1 Summer 10/1	Winter: 5/1 Summer: 10/1		Delay in project start date caused date change – winter analysis in progress.

Timeline	Original Date	New Due Date	Date Completed	Notes
Draft Final Report	4th Quarter 2011			
Final Report	Approximately four weeks after delivery of draft report	TBD		

For study validity purposes, study needed to begin at the same time as the Pilot. Contract delays and subsequent data delays may lead to bias in the results as customer responses to baseline questions are already influenced by the program inception.

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. Because of synergies with the CL&P project, initial draft letters and surveys are available for UI review. NMR is completing an updated Workplan and baseline surveys should be possible soon.

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 out 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 and work on the CT project is beginning.

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.

Metered data from winter temperature sensitive measures and process measures has been collected and initial analysis complete. Winter season billing data have been coming in with some challenges in matching meters with customer account numbers slowing the process.

An initial draft of the summer temperature-sensitive measures was supplied as scheduled in December. GEP developed an acceptable second draft. This "phase 1" draft will be bundled with the results for winter into a single Project Report. The draft project report is expected by April 15th. This would put the entire project back on its original timeframe.

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			

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

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.

Michaels Energy was selected to complete the project. Contracts are now complete. The study kick-off meeting was held on February 17th. Michaels is completing the workplan, and beginning sample design and data collection plan. Data collection from UI is complete.

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.

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 expend 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. Preliminary results are expected by mid-April and a draft report by mid-May.

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. Since then, KEMA has refined the spreadsheet tool and populated it with the data. Subcommittee review of the draft spreadsheet tool and report outline concluded on March 15. Draft tables of study results, and an updated tool will be delivered in late March, and the draft report will be delivered for subcommittee review by mid-April.

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 project schedule has been extended to accommodate a change in available program data. Onsite data collection complete, and data analysis will take place this fall/winter, of 2011.. Preliminary results will be available for subcommittee review in mid-late April with a final report expected in 2nd quarter.

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. The characterization sheet was based on very small sample and substantial additional work will be required. The Forum anticipates a report in the 2nd quarter.

IMPACT OF ENERGY EFFICIENCY ON CODES AND STANDARDS

This project is intended to accommodate several recent developments:

- The DPUC Order in to begin examining 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.