



To: Energy Efficiency Board
 From: Kim Oswald, on Behalf of the EEB Evaluation Committee
 Date: January 5, 2012
 RE: Evaluation Committee Status Report – for January Meeting

STUDY SUMMARY

Study	Selection Date	Contract Date ¹	P.O. Date	Final Report Filed	Notes
CL&P HERS Pilot – Impact, Process and Persistence	10/28/2010	01/10/2011			Initial billing analysis complete; 2 nd Survey to begin soon. Need to get Company contact information
UI HERS Pilot – Market Acceptance	01/13/2011	06/13/2011			Initial survey complete; analysis underway; Focus groups complete; analysis forthcoming
Res New Construction Baseline	02/03/2011	CL&P 03/09/2011 UI 08/12/2011			All site visits complete, analysis underway. Report expected early February.
RCx/O&M/BSC Impact	12/21/2010	CL&P 03/09/2011 UI 03/30/2011			Summer fieldwork for RCx complete, O&M and BSC on-site and customer research nearly complete. Winter fieldwork beginning
EISA Focus Groups	08/17/2011	09/22/2011		Draft 10/10/2011	Complete. Filed November 28
EISA Market Impacts	07/01/2011	12/08/2011			Draft Workplan Complete
Residential Measure Life and Persistence	07/01/2011	12/08/2011			Workplan development underway
Residential Lighting Saturation	07/01/2011	12/08/2011			Workplan draft complete
Efficiency Opportunities in Multi-family	07/01/2011	12/08/2011			
Ground Source Heat Pump	07/01/2011	12/08/2011			Workplan in Development
Early Replacement of Gas Water Heater with On-Demand Units	07/01/2011	12/08/2011			

¹ Contract delays result from multiple issues including contractor review of newly instituted Terms & Conditions from both Companies in Spring of 2011, general inertia by both Contractors and Companies, and Company inaction

Study	Selection Date	Contract Date ¹	P.O. Date	Final Report Filed	Notes
Early Replacement of Electric Resistance Water Heater with HPWH	07/01/2011	12/08/2011			
Assessment of PSD	08/19/2011	12/08/2011			Workplan Complete. Waiting for Contract
Free Rider/Spillover in C&I Programs	08/19/2011	12/09/2011			Workplan Complete. Waiting for Contract
Remaining Opportunities in C&I Lighting	08/19/2011	12/09/2011			Workplan in Development
SBEA Impact	07/31/2011	Pending			Workplan in Development - waiting program measure information

CURRENT RESIDENTIAL STUDIES – NOT IN RESEARCH AREAS

RESIDENTIAL BEHAVIORAL PILOT PROGRAM (HERS)

CL&P PROJECT, CONTINUED FROM 2010 \$252,700
 UI, STARTING IN 2011 \$ 78,030

Both of these studies suffered significant contracting and/or program initiation delays that require the studies to continue beyond their original completion dates.

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 maintain program-induced savings after mailing cease

Over the last month, an interim savings report has been produced and revised. However, we are holding it open for now due to continuing questions about the savings estimates for electric-heat customers. After resolution of those concerns, the report will be finalized.

NMR is currently fielding a follow-up survey to assess actions customers indicate they are taking and to examine the customers experience and impressions of the program to date. The survey should be complete in the next 2 weeks and analyzed soon thereafter.

Persistence Assessment began in October with initial analysis in January 2012 and completion at least 6 months later.

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 for this less complex study on January 12.

After several delays, the countersigned contract was provided on June 13 – the new evaluation start date. The late start required some change in focus since participating customers were no longer new to the program. Instead of completing a baseline efficiency profile, an initial participant survey examined customer perceptions of the usefulness of the Home Energy Reports, customer-reported actions taken as a result of suggestions in the reports and customer suggestions. Survey analysis is complete.

Follow up focus groups were conducted in December. Results of the focus groups were analyzed and a memo regarding conclusions from the activity provided. Customers in the Focus Groups generally reported that they were not very engaged with the program with many indicating that they did not know that there was information on the back of the report they received each month. Others reported that they had read the tips on the reverse, but found them too generic to be helpful.

Since a focus group collects information from a fairly small group of customers, a survey is being used to follow-up with a broader customer group to determine whether the experiences recorded are frequently shared by participants as a whole. That survey has been designed and should be in the field late January and into February.

While the study was originally expected to be completed before the end of 2011, initial contract delays brought several important, customer-oriented tasks into the holiday season resulting in an expected completion date of March of 2012.

RESIDENTIAL NEW CONSTRUCTION BASELINE \$209,800

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 and the EEB Evaluation Committee concurred with this recommendation. 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. However while UI had first requested that this study be moved up to be complete in time for the 2011 filing, UI's contracts were not complete until August 12. Therefore, NMR has started scheduling and conducting site visits to houses in the UI service area in September. We

will be able to capture some results no matter when on-sites are completed; however, air conditioning testing can only be done when temperatures are at least in the mid-60's with some additional exceptions where higher minimum temperatures are required.

Inspection and measurement at non-program, newly-constructed homes are now complete. NMR has now analyzed the data to determine a reasonable baseline for new construction in Connecticut. The project report is currently being written.

CURRENT COMMERCIAL/INDUSTRIAL STUDIES – NOT IN RESEARCH AREAS

IMPACT EVALUATION OF THE RETRO-COMMISSIONING/O&M SERVICES PROGRAM – BSC INITIAL ASSESSMENT \$375,000

Michaels Energy has been retained to conduct this impact evaluation. The study will provide savings data in order to quantify the savings benefits of efficient measures and processes developed in commercial and industrial (C&I) facilities through the RCx/O&M Services (O&M) programs. 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

There have been several project delays. Contracting issues led to a late start to the project, delaying winter seasonal data collection until 2011-2012. Data issues also resulted in some delays, although these delays were anticipated to varying extents. For CL&P in particular, program data are maintained in paper files. So the Contractor came to CT and scanned the individual files for analysis. Additional project files for several CL&P sites could not be located. Because of the lost files, Michaels has had to alter the sample plan to assure statistically valid results. Currently, data for 10 of 12 of the missing/new sites has been located and is being sent to Michaels. UI has submitted available data for projects in their O&M program. UI's RCx data are complete.

After the initial delays, Michaels has completed field work for all RCx sites through the summer season. Additional metering will be required for the upcoming winter season and will continue throughout the winter. The initial onsite visits for placing meters for the winter data collection for the RCx program were completed. Metering will continue into January, with the logger removals being completed in January and early February. For the O&M program, additional sites were needed. Currently 2/3 of the sites have been recruited. Recruitment will continue into January. Michaels is expecting that the additional project information from CL&P for backup sites will be available to supplement the original sample. The field work was completed for the computer industry onsites and approximately half of the "other" sites. We are expecting to continue with the field work for the "other" sites and the compressed air sites in January. For the BSC program, a total of 9 customers were interviewed. The remaining six participants have been non-responsive. The BSC report is expected to be finalized in January.

After data collection and analysis are complete, the draft report should be complete in March.

RESEARCH AREA STUDIES

Descriptions of projects initiated and anticipated under each Research Area are provided below. Please note that, until Scopes of Work are complete, study costs cannot be established. Therefore cost figures are only supplied when known.

RESIDENTIAL RETROFIT AND RETAIL PRODUCTS/RESIDENTIAL NEW CONSTRUCTION AND EMERGING MEASURES RESEARCH AREAS

These two residential research areas have been combined for convenience because a single lead contractor was selected for both areas. The NMR Team (NMR Group, KEMA, Cadmus Group and Tetra Tech for Res Retrofit and NMR Group, KEMA, Cadmus Group and Dorothy Conant for Res New Construction) will share task and project responsibilities as suit the situations.

EFFECTS OF EISA LIGHTING REQUIREMENTS ON RESIDENTIAL PROGRAMS

PART 1: EISA FOCUS GROUPS - COMPLETED NOVEMBER 21, 2011 \$46,110

The first step in the overall EISA Lighting project is to conduct a series of focus groups that examine customer opinions in depth. In addition to providing substantial information on its own, the focus groups task also provides the starting point for broader, but less in-depth survey approaches.

The focus groups concentrate on determining the answers to these major foci:

- How do customers expect to react to the differences in bulb availability under EISA?
- To what extent does more knowledge and exposure to newer technologies change the options customers expect to take?
- What other programming opportunities exist to help customers make more efficient lighting choices?

The direct result of the Focus Groups is a set of recommendations for methods PAs might employ and program changes for the PAs to consider. The results also feed into the next parts of the study.

PART 2: EISA SOCKET SATURATION AND SURVEY – \$212,700.

The overall study will examine current saturation of efficient lighting, likely programmatic impacts of the new requirements, and remaining program opportunities for residential consumer lighting after EISA efficiency standards are initiated. Residential lighting saturation will be assessed using an onsite survey. 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. NMR has provided a Scope of Work. The draft survey protocol has been developed and customer data requested from the Companies. Once that data is in, the survey should start quickly; the expected time frame is to start conducting the survey late this month.

The project's next step is to complete an onsite assessment of socket saturation, customer attitudes and behaviors and the action customers expect to take as the lighting markets change. Protocols for that work are currently being developed.

HES/HES-IE PERSISTENCE, IMPACT AND PROCESS EVALUATIONS

The three HES/HES-IE studies are closely related, but it is not yet clear how best to combine and stage the part of the studies to capture economies of effort most effectively. For now, the 3 pieces below are discussed separately, but at least some aspects of each are likely to be combined as the project move forward.

RESIDENTIAL MEASURE PERSISTENCE

This study is intended to examine 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.

The Contractor is finalizing the Scope of Work for this project and developing data requirements for completion of the study. The final SOW should be completed in the next weeks.

HES IMPACT AND PROCESS EVALUATION STUDY HES-IE IMPACT AND PROCESS EVALUATION STUDY

Process assessment of the HES efforts is becoming increasingly important as the programs are being asked to create much higher levels of savings. While relevant for both sub-programs, HES-IE in particular needs to be able to generate increased savings for a far broader range of customers. Internal and external barriers to the program will be examined to identify possible improvements to marketing, recruiting, providing services, and moving from education to action.

For all three of these pieces, study objectives have been discussed and clarified. The workplans are being developed, with drafts due later this month.

GROUND SOURCE HEAT PUMP STUDY ~\$330,000

This study will entail working with CEFIA to do an impact analysis for HVAC and water heating applications as well as carbon impact analyses resulting from program-related installation of geothermal heat pumps. This study will use metering and engineering modeling to assess direct impacts. Discussions with customers and installers will provide information on how decisions are made to install GSHPs, what alternatives are considered, knowledge and adherence to installation requirements and overall cost impacts. Currently, the Contractor has revised the scope of work and plans to start field work as soon as approval is granted.

CENTRAL AIR- CONDITIONING IMPACT EVALUATION

This impact evaluation will assess savings resulting from either equipment failure or early replacement of central air conditioning units. Due to the vagaries of the weather, the study is expected to cover 2 years of measurement. In addition, the study will explore ways to increase customer acceptance for retiring older CAC equipment prior to failure. The workplan for this study is now being developed. The study will begin metering this summer.

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. Little work has been completed to date.

EARLY REPLACEMENT OF ELECTRIC RESISTANCE WATER HEATER WITH HEAT PUMP WATER HEATERS

Market and Potential Impact from an early replacement option for electric resistance water heat customers. To date, initial document review has revealed far improved equipment quality and more established

manufacturers. Given the high expected savings from the measure, it appears that additional market assessment work is warranted.

CROSS-CUTTING STUDIES RESEARCH AREA

The Cross Sector studies RFP did not result in reasonable proposals for the out-year studies. However, the 2011-initiating studies were well-designed by a team lead by Tetra Tech. Tetra Tech will complete the 2011 studies while a broader search continues for the longer-term studies. UI contracts are not yet completed and thus Tetra Tech has initiated only the small initial evaluation steps.

For 2011 the studies are:

- **ASSESSMENT OF THE 2012 PSD \$178,733**
The result of the study will be a proposed next edition of the PSD. Additionally, the study will recommend new or additional studies needed to support Connecticut-based inputs to the PSD. The draft Scope of Work is complete awaiting contract execution.
- **FREE RIDER & SPILLOVER (FR/SO) STUDY IN C&I PROGRAMS \$165,400**
This study had originally been proposed to start in 2012. However, Tetra Tech completed the last FR/SO study and did an excellent job. Contracting with them for this study allows for a consistent methodology to be employed. The SOW is now completed and is being formatted for UI's Purchase Order procedures.
- **REMAINING OPPORTUNITIES IN C&I LIGHTING**
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 within individual customer types. As an initial stage in this work, the Contractor is developing a scope of work that will examine the C&I program databases over the last 5 years to see if there are patterns in what types of customers are being reached, frequency of participation and lighting implementation as a gateway for further action. CL&P is determining whether they are able to provide data to support this effort – because of the long time period to be examined, data will be needed from their legacy database, which may make data collection overly difficult. If so, this study might be done using only UI data.

SMALL C&I RESEARCH AREA

Proposals for the Small C&I research area were provided on June 11. A team lead by KEMA was selected to complete the studies. Contracting for this research area is taking an extraordinarily long time. While complete proposal and selection documents were provided on July 31, UI contracts are not yet complete.

IMPACT EVALUATION OF SBEA

A Small Business program impact evaluation was completed in 2009. In many program areas, it provided good impact values and collected large amounts of information on lighting and lighting controls. However, additional information on impacts from air-conditioning and refrigeration measures need to be collected as those areas were largely missed in the random sampling process.

Over the 2012 -2014 time period, Small C&I studies are expected to include:

- New construction baseline

- Measure persistence
- SBEA Opportunities and measure life study
- Market for financing options
- Case study development to support target markets
- Full market segmentation assessment
- Assess opportunities for a BSC approach to small businesses

LARGE C&I RESEARCH AREA

The Large C&I RFQ resulted in selection of Energy Market Innovations (EMI) to lead the consultant team. Contracting for the Team is now underway and a kick-off being planned.

Starting in 2012 and 2013, studies are expected to include:

- ISE IMPACT EVALUATION – Subject to ISE timing
- Process Evaluation of Business Sustainability Challenge
- Impact and Process of Energy Opportunities
- Opportunities and Barrier in Municipal, Government, Schools and Hospitals
- Assessment of Commercial Real Estate
- State Buildings – Metric Development, Comprehensive Projects
- Performance Contracting in Municipal, Government, Schools and Hospitals
- Opportunities to Bundle Measures in C&I HVAC

REGIONAL EM&V FORUM – 2011-2012

Net Savings Project—Project PD10-1: in November, the Net Savings Definitions and Research project was kicked-off. The team of NMR Group and Research Into Action was selected as the contractor for this project. The project will develop regionally common definitions for adjusted gross savings and net savings, as well as conducting exploratory policy research to catalog and assess examples of how net, adjusted gross, and gross savings or other indicators are used in the development and measurement of progress towards various state and regional energy and environmental policy goals. This project builds on a 2010 Forum project, the Net Savings Scoping Study. Please contact Elizabeth Titus with any questions about the Net Savings project.

Regional Energy Efficiency Database (REED) —Project PD11-3: The Regional EE Database subcommittee will be meeting Dec 20 where NEEP and Peregrine (project contractor) will provide an update on the project. To date, the energy savings and expenditures modules have been developed, with plans to complete the avoided emissions and job impacts modules, and begin work on the REED outputs/reports, and aiming for testing with states in January. Recent developments, however, will likely affect the project – including modifications to some of the reporting parameters as well as the project schedule. In the past two weeks, at the request of ISO New England, NEEP has met with ISO-NE staff to discuss the potential use of REED to serve as the source for ISO-NE to collect EE data as the basis for forecasting EE in its Regional System Plan. Discussions are underway with ISO New England and New England state commissions regarding what changes to REED would be needed, what would be associated cost, and how such modifications would be funded. Other key issues to consider and address are timing of reporting (ISO-NE is interested in semiannual reporting), and how the data collection modules could be formatted where some reporting parameters apply only to New England states, and not all Forum state members. For more information, contact Julie Michals.

Load Shape Study-Data Collection Protocols/Guidelines (Project B1 on the private web portal): In November, the load shape subcommittee kicked off its load shape data collection protocols project. KEMA , the firm contracted to develop the guidelines, also delivered a draft protocol for C&I lighting loadshape data. **This is**

under review by the subcommittee with comments due in early January (TBD). Additional draft protocols are expected for C&I HVAC, motors, process measures and residential lighting and HVAC. The purpose of these is to facilitate sharing of data from end-use load shape research and evaluation projects conducted by the Forum, as well as non-Forum entities as appropriate. This project, funded by 2011 Add-on Research budget, is intended to increase the usability of data collected in future metering studies, following a recommendation from the Forum's Phase 1 Load Shape Study that catalogued existing load shape data. The subcommittee is also in the process of selecting 1-2 priority measures for primary research for the next phase of the Forum's load shape study, which will begin in early 2012. Please contact Elizabeth Titus with any questions about this project.

Incremental Cost Study Add-on Research (RE11-3): Phase 2 of the Incremental Cost Study has been kicked off. Navigant Consulting has been retained. This builds on the 2011 project, which is posted to the Forum's Products and Guidelines webpage. Phase 2 includes 2 tasks: the first task is to do additional diagnostic work on a small subset of measures from the 2011 project (such as residential HVAC, insulation and air sealing). The second task is to determine the cost of material/equipment for baseline and efficient measures, the cost of baseline labor and, where appropriate, incremental costs of labor for additional priority measures. Task 1 is being funded by 2011 Forum funds.

Task 2 will be funded by a combination of remaining 2011 funds and 2012 funds that must first be approved. Denise Rouleau is the project manager under contract to NEEP. Please contact Elizabeth Titus with any questions.

RE12-3: Residential Lighting Sales Market Lift Project and Post EISA Lighting Sales Trends and emerging Baselines. This project would provide insight into emerging and regional lighting sales trends developed over 12 months that allow for adjustments to lighting incentive design and execution. The project will include developing pilot projects in 2-3 states to test the efficacy of the "market lift" model in promoting sales of efficient lighting, using acquired full category retail lighting sales data for evaluating residential lighting sales trends and shifts in the baseline wattage.

PD12-1: Cost-Effectiveness Project. This project would review and build on a forthcoming ACEEE report "Energy Efficiency Evaluation Review Project" that will describe how each state handles analyzing the C/E of their energy efficiency programs. This project will identify and explore relevant issues for interested Forum states, which may include a review of the Total Resource Cost (TRC) test and how it is implemented throughout the region, opportunities to improve implementation of the test (e.g., examining input assumptions), and consideration of other recommendations for overcoming challenges with use of the TRC test. The goal of this project includes addressing how to increase transparency and potentially build consistency across the region, where appropriate, in applying C/E tests to help facilitate comparisons across states.

PD12-3: Estimate EE Impact on Advancing Energy Building Codes & Standards. The purpose of this project is to support states interested in attributing and claiming savings associated with EE program activities directed at improving C&S and compliance. The project will build on the Forum's 2010 C&S workshop and other recent research (e.g., MA, IMT). Specific tasks are to: 1) prepare an overview of current policy and practice in the Forum region; 2) catalog activities suitable for PAs to support or influence development, adoption and compliance of national and state C&S; 3) develop high level estimate of energy savings associated with improved code and compliance levels by state; 4) prepare guidelines that recommend approaches for attributing savings associated with EE program activities; and 5) recommend roles/pathways for stakeholders to secure regulatory approval of selected activities and attribution frameworks Project funding from Edison Electric Institute (EEI); the Institute of Market Transformation (IMT), and NEEP Policy funds

RE12-1: Loadshape Research (Phase 3) – (100% Carryover from 2011). This project will address additional measure(s) to those researched in 2009-2011 projects (commercial lighting and unitary HVAC). Project subcommittee currently reviewing priority measure(s). The goal of the Forum’s loadshape studies is to make loadshape data (impact of electric energy efficiency programs during identified periods of time e.g., hourly, seasonal and annual consumption data used to analyze coincidence factors and other usage patterns) available to Forum participants for use in implementing EE programs, participation in capacity markets, and meeting air quality needs. The project will likely refer to metering data collection protocols being developed by the Forum that are intended to increase the transferability and usability of metering data by PAs. *Note: As a 100% carryover project from 2011, Forum funders who prepaid this project for 2011 will not have to fund their 2012 cost share.*