The 2014-2016 EEB Program Evaluation Plan

Connecticut Energy Efficiency Board Evaluation Committee

October 2013

Final Report

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Contents

PREFACE

The EEB Evaluation Committee and the Energy Efficiency Board (EEB) is pleased to present its Evaluation Plan to the Department of Energy and Environmental Protection (DEEP) and the Public Utility Regulatory Authority's (PURA). The Evaluation Plan is designed to provide cost effective studies in support of all the CL&M programs.

Program and measure evaluation, measurement and verification are conducted on an ongoing basis, with emphasis on impact and process evaluations, programs or measures that have not been studied, and those that account for a relatively high percentage of program spending. Evaluations use statistically valid monitoring and data collection techniques appropriate for the programs or measures being evaluated. All evaluations use appropriately skilled, experienced and independent professionals for the methods being employed. All evaluations continue to contain descriptions of any problems encountered in the process of the evaluation, including, but not limited to, data collection issues, and make recommendations regarding addressing those problems in future evaluations. The Plan integrates evaluations for gas and electric programs and takes advantage of opportunities to cooperate with others in the Northeast on evaluations and market research that offer the same types of measures as does Connecticut.

Most importantly, the Plan provides for an independent evaluation process. It is critical that the programs be evaluated, measured, and verified in a way that provides confidence to the public at large that the savings are real and in a way that enables the Companies to use those savings estimates and other results with full confidence. There is a need to ensure both the reality and the perception of the independence and objectivity of EM&V activities.

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1. BACKGROUND

Connecticut's utilities have a long history of providing efficiency programs. Early efforts came via the regulatory process, and in 1998, Conn. Gen. Stat. § 16-245m(a) instituted a conservation charge of 3 mills per kilowatt hour to support electric conservation and load management (CL&M). These monies constitute the Connecticut Energy Efficiency Fund (CEEF). Additional funding is provided through CO_2 sales in the Regional Greenhouse Gas Initiative (REGGI) and sales of resources from energy efficiency resources to the New England ISO in the Forward Capacity Market (FCM).

The predecessor to the Energy Efficiency Board (EEB) was formed and charged with the responsibility to advise and assist the utility distribution companies in the development and implementation of comprehensive and cost-effective energy conservation and market transformation plans. Since that time, the EEB has worked closely with the Companies to conduct an array of energy efficiency oversight responsibilities, but their evaluation responsibilities include ensuring the Connecticut evaluation work is relevant, independent, cost-effective and meets the needs of program administrators and planners.

In 2005, The EEB formed an Evaluation Committee to work directly with an EEB Evaluation Consultant in overseeing evaluation planning and completion. In 2009, the Department's decision in Docket No. 08-10-03 ordered the EEB's Evaluation Committee and their consultant to be independent from and totally responsible for all aspects of the evaluation process. Public Act 13-298 was enacted June 5, 2013 (effective on the date of passage). Section 16 of that Act amended Conn. Gen. Stat. § 16-245m(d) by assigning to the DEEP Commissioner the authority to approve, modify, or reject the 2013-2015 C&LM Plan, including both electric and gas portions of the Plan.

The EEB and the Electric and Natural Gas Companies recognize the importance of conducting thorough, timely, and independent evaluations. The various types of evaluation studies exist to support continuous improvement in program offerings and to measure the results of those programs. The audiences for evaluation are many. Regulatory bodies, the regional electric system operator (ISO-New England), the Energy Efficiency Board, utility management, and program planners and administrators all need the information gained through evaluation in order to make decisions about program efficacy. Evaluation research can also provide the basis for determining program direction or focus. Research completed within the evaluation group is used to increase participation and savings, reduce costs, and fine-tune procedures. The research provides intelligence to be used to expand the reach of the programs, using messages more relevant to the non-participating customers. Appropriate evaluation can provide the information that program administrators need to enhance existing cost-effective programs or to take a non-cost-effective program and reconstitute it as a successful one.

State Efficiency Goals and Evaluation Implications

The State of Connecticut has established a goal that its energy efficiency programs should transition from an annual, resource acquisition perspective based on traditional utility incentive programs to a multi-year, market transformation approach, resulting in fundamental change in energy usage and management based on market driven and financing approaches. The associated long-term strategic goals have been expressed in Legislative actions, Administrative directives, CT's IRP and CES, EEB's strategic objectives, etc.), and include the following:

- Capture all cost-effective energy efficiency
- Broadest reach to all market segments, especially under-served, economically challenged markets
- Leverage CEEF funds through financing, project brokering, other innovative strategies and the increased reliance on private capital
- Effect genuine market transformation by raising the performance of the "natural market" on a sustainable basis and reinforcing with codes and standards
- Deep energy savings for all customers and for all energy types, beyond equipment upgrades and single-measure installations, including whole house and whole building approaches
- Provide comprehensive business energy solutions to enhance business competitiveness through integration with on-site generation, load management, smart building/process/systems management, etc.
- Continue to grow an infrastructure of highly skilled professionals to deliver energy efficiency services to homes, buildings and industry
- Promote sustainable energy management as a core business value through behavior and culture change.

To respond, the programs are being fundamentally re-evaluated and changed to help achieve these goals, with a focus on a continuous improvement approach that is supported by a flexible and timely evaluation and market research capabilities. The implications for the evaluation and associated market assessment work include:

- Traditional evaluations for regulatory purposes
- Evaluations that seek near real-time feedback
- Identification of innovative approaches and best practices, options for continuous improvement, and exploration of "next" opportunities
- Focused on actual building energy performance to support improvement
- Develop market understanding to support development of appropriate, effective, and tailored programs and improvements
- Leveraging (CEEF) funding for greatest value and robustness of the research, and evaluation of allied initiatives
- Exploration and adoption of effective protocols for documenting savings and practices

- Counting all of the savings, including those from initiatives related to codes and standards, and market improvements in the design/construction trades
- Exploration of elements of the broader business and sustainability case and acknowledgement of the broader benefits from the State of Connecticut's efficiency investments and practices.

Evaluation Independence and Ethics

Funding for the development of energy efficiency resources is derived from Connecticut electric and natural gas ratepayers, as described above. In 2007, Public Act 07-242, (Conn. Gen. Stat. § 16a-3a), Section 51 required the state to give priority to the procurement of energy capacity through efficiency measures. The documents also state that "resource needs shall first be met through all available energy efficiency and demand reduction resources that are cost-effective, reliable and feasible." ***Independent***[1] evaluations are conducted to assure regulatory bodies whether there is proper use of ratepayer funds, to provide reliable and unbiased information to assess cost-effectiveness of energy and demand resources, and to provide information to support program improvements. This has generally meant that evaluations are conducted by firms with an expertise in evaluation science and its associated methods in statistics, engineering, sociology and economics. To ensure unbiased evaluations most states require evaluations be conducted by evaluators that have independence as third-party evaluators of the programs.[2] To be third-party independent means that the evaluation entity will in no way benefit from the evaluation results being one estimate or a different estimate. The use of professionally skilled third-party evaluation firms enables all ratepayers to have full confidence in independence and objectivity of the evaluation, credibility of program results, and recommendations for program refinement and investment decisions (both in the reality and the perception). The third-party independence of energy efficiency program evaluation also enables a clear distinction between scientific evaluation results and the policy rulings and decisions set by regulators, state agencies or political representatives.

Evaluation ethics are a critical foundation for evaluations and the field of evaluation, and the five key guiding principles are summarized below[3].

A. Systematic Inquiry: *Evaluators conduct systematic, data-based inquiries about whatever is being evaluated.*

B. Competence: *Evaluators provide competent performance to stakeholders.*

C. Integrity/Honesty: *Evaluators ensure the honesty and integrity of the entire evaluation process.*

[1] Specifically, third party independent

[2] First party individuals and entities include all those that operate the programs and directly receive financial benefits of the programs. Normally this includes the utilities, program administrators, program participants, employees of these firms and participating or associated contractors and vendors. Second-parties are those who also have a reason that could bias their conduct or interpretation of evaluation results such as those with ownership in any first party entities, program designers and planners, employees of state agencies, regulators or other individuals that derive employment, public acceptance or political resources due to the outcomes of Connecticut's energy efficiency programs.

[3] Principles adopted by the American Evaluation Association (AEA), and summarized from The American Journal of Evaluation, and the AEA's web site.

D. Respect for People: *Evaluators respect the security, dignity, and self-worth of the respondents, program participants, clients, and other stakeholders with whom they interact.*

E. Responsibilities for General and Public Welfare: *Evaluators articulate and take into account the diversity of interests and values that may be related to the general and public welfare.*

Independent Evaluation Contractor Approach for 2014

Starting in 2011, a revised process was used for selecting independent consultant. Rather than selecting consultant expertise on a project-by-project basis, the Evaluation Committee, through the Roadmap, instituted a Research Area Approach to managing and structuring the overall evaluation function. This enhanced the efficiency of the management of evaluations and the EEB, and eliminated much of the RFP work that could take two to 6 months prior to beginning work. Through a nationally competitive RFP process, umbrella expert contractor teams (for the period 2012-2014) were selected for the four research areas: Residential, Residential Retrofit and Retail Products, Small Commercial and Industrial and Large Commercial and Industrial. The 2014 evaluation studies put forward in this 2014 Evaluation Plan will be the last instituted under these current contracts.

2. 2014-2016 EVALUATION PLAN DEVELOPMENT PROCESS

The process used to develop the 2013 Evaluation Plan was much abbreviated; generally, a completed document was presented to the Evaluation Committee for approval in October or November. The Evaluation Consultant Team developed a revised 2013 process with an eye toward allowing the designated stakeholders to become more familiar with the projects, and to provide an organized forum for input to the Evaluation Consultants as they developed the Plan.

Adopted Process

After review of the Roadmap, key supporting documents, and past evaluation plans, the Evaluation Consultants developed a process for development of the 2014-2016 Evaluation Plan. The objectives were to develop the plan under a process that complied with the Roadmap, but to provide opportunities for greater input and longer chance for input from the identified parties. The 2012 Roadmap's requirements are cited below.

> *"With consultation and input from the EEB Technical Consultants and the Program Administrators, the EEB Evaluation Committee and Evaluation Consultant develop an initial slate of evaluations expected to be needed, set overall priorities, and establish the evaluation budget in line with those priorities. Program and measure Evaluation, Measurement and Verification (EM&V) studies are conducted on an ongoing basis, with emphasis on impact and process evaluations, programs or measures that have not been studied, and those that account for a relatively high percentage of program spending. The Companies, separately and together, provide important programmatic information that helps ensure that needed information on evaluation issues, program structure, and ex ante estimates are available to the Evaluation Consultant in a timely manner. For evaluation planning, the Companies and the EEB Technical Consultants provide the EEB Evaluation Consultant with:*
>
> - *Lists of studies each entity would like to be included in the evaluation plan;*
> - *Suggested priorities for those studies that consider both the need for the information and availability of funds;*
> - *Budgets that are sufficient to support the final plan as determined by the EEB Evaluation Committee and approved by the EEB;*
>
> *The evaluation plans and budget are reviewed and approved by the EEB Evaluation Committee. Voting members of the Board determine the final budget for evaluation. The approved evaluation budget will be incorporated into the budgets presented in the Annual C&LM Plans. The electric and gas Program Administrator representatives and the representative of a municipal electric energy cooperative are not voting members of the Board and may not vote on board plans, budgets, recommendations, actions or decisions regarding such evaluation budgets, program evaluations and their implementation. The Evaluation Consultant:*
>
> - *Provides the Evaluation Committee with a package of program evaluations, priorities and costs;*
> - *When the evaluation plan is approved by the EEB Evaluation Committee, establishes resulting total budget to submit to the full EEB for vote;*
> - *Writes Evaluation Plan to be approved by the EEB Evaluation Committee and EEB and included in the filing of the Companies' Annual Plan;*
> - *Revises the plan periodically, with Committee approval, to reflect changes in opportunity, circumstances, remaining budget or other considerations."*

The more open process (described below) that was proposed by the Evaluation Consultant Team and adopted by the EEB Evaluation Committee still complied with the defined roles of the Roadmap:

- The roadmap is clear on the role of the evaluation committee, the evaluation consultant, the EEB Technical consultants, and the main EEB in the development of the evaluation plan.
- The main EEB only votes to approve the final 3-year budget amounts.
- The main EEB reviews the proposed plan and determines if the budget is satisfactory given the plan and the EEB program/board objectives.

The steps used for development of the 2014-2016 Plan are listed below.

Step 1 -Initial "Needs" Review / Assessment: Evaluation Consultant Team reviews past evaluation plan; past studies; timing cycles for impact / process evaluations; research and information gaps for program and planning guidance; directions and "next steps" from previously conducted research; evaluation goals /program priorities; and best practices in evaluation regionally and nationally. Early in the process, requests were made of the Technical consultants to make sure the Evaluation Consultants understood any data needs to support integrated planning and other work so these considerations could be incorporated into our development of priority projects. The Team developed a number of project concepts.

Step 2 - Solicitation of Project Concepts: Team formally solicits (via emailed forms) research ideas from stakeholders including the Committee, Board, Utilities, consultants, contractors, and Northeast Energy Efficiency Partnership (NEEP)[4], requesting studies addressing IRP data needs, planning gaps, regulatory evaluation requirements, and studies that address the evaluation goals in support of the evaluation goals of the overarching legislation. The form requests basic project information, with an emphasis on the project's outcomes, and the rationale behind it being a priority project. NEEP studies were specifically requested with the same timing to allow one integrated prioritization / ranking process.

Step 3 - Initial Criteria Development / Review: SERA Team works with EEB Evaluation Committee to identify and develop criteria to be included in the project prioritization process; the Evaluation consultants weighted the criteria and used them to prioritize the submitted projects / concepts. The criteria used in the 2013 process included the following (not in ranked order).

- Related to priority Goals and Objectives: Higher priority if the project (concept and outcomes) support the efficiency and evaluation goals for the State, with a focus on being able to identify cost-effectiveness of programs and strategies (listed above).
- Need updated Impact evaluation for the program: Higher priority if there exist quality concerns over prior work; a long time has passed since prior work; program changes have arisen; there is variability in prior estimates; there is poor program performance in past (*e.g.*, low net-to-gross ratio (NTG))
- Need updated Process evaluation for the program: Higher priority if there exist quality concerns over prior work; a long time has passed since prior work; program changes have

[4] NEEP was not mailed a form, but a formal request for concepts was delivered; SERA staff participated in associated brainstorming and concept development sessions with NEEP staff and state representative conference calls.

arisen; there is variability in prior estimates; there is poor program performance in past (*e.g.*, low satisfaction)

- Risky/Important Data Gaps: Higher priority if the data are important for IRP or program level planning, or there is high uncertainty/variability with what is currently used
- High contribution to savings /budget: Higher priority if the measure/program contributes significant savings or has a substantial budget
- Support savings growth & development: Higher priority for research focused on how the program can best serve the market, or meet demands/savings growth
- Research Needed: Research needed for: Higher priority for projects addressing issues of baseline; legislative requirements; elements of benefit/cost analyses (B/C) (including costs, Effective Useful Life (EUL); or new measures/programs.
- Prior/ongoing research: Higher priority for projects that are completions/continuations of evaluation work, or build on prior/ongoing research, as long as the project and the outcomes are important.
- Cost vs. value: Rankings are reviewed based on cost to conduct research compared to the value of the outcome.
- Needed for a balanced study portfolio: Rankings are reviewed based on a desire to balance studies between Market Research, sector research, etc.
- Other: High priorities may be assigned for special reasons not reflected in the other criteria.

Step 4 - Outline Basics of Candidate Studies for Consideration: The SERA Team used the information from the initial Team project list and the submitted project concept forms to weed out duplicates, flesh out the concepts, and develop a list of candidate studies for consideration. Summaries were prepared for review by the Committee, outlining the study's name, 2-5 sentence description, data sources (primary / secondary, surveys, etc.) and the major outcomes anticipated and why they are a priority.

Step 5 - Initial Ranking, Distribution, and Discussion with EEB Evaluation Committee: The Evaluation Consultants carefully considered and scored / prioritized the studies, developed a ranked list of the candidate studies, distributed to the Committee, and provided multiple opportunities for review and input by the Committee. The discussions provided input to refine the studies and better understand rationales for priorities. New studies and criteria were also discussed at that time.

Step 6 - Refined Budgeting and Ranking, Recommendations, and Confirmation by EEB Evaluation Committee: **The SERA team** worked internally and with contractors on high priority projects to obtain refined cost ranges, and used the information to refine the project priorities. At this stage, the projects were re-ranked, based on incorporating cost considerations and the timing / phasing for the projects was developed. During this phase, opportunities were provided to discuss the rankings with the Evaluation Committee, utilities, and contractors.

Step 7 – Develop Evaluation Plan: The SERA Team prepared a formal Evaluation Plan Document that will go in utility filings (consistent with Page 3 of Roadmap), including studies and budgets. *When the evaluation plan is approved by the EEB Evaluation Committee, the Consultant team establishes resulting total budget to submit to the full EEB for vote.* RFPs and contracts are based on this new Plan.

In the process of developing and designing the projects presented, the Evaluation Consultant team took additional factors into account beyond the goals and objectives. In some cases, a number of independent studies were suggested that "touched" the same program or customer groups. We took great pains to coordinate and marry projects where multiple priority outcomes could be achieved from a coordinated project. This provided opportunities for cost savings, as well as minimizing the burden to Connecticut program participants. Adding NTG and NEI research to process evaluations (to reduce rounds of surveys) are examples of this kind of economizing. In other cases, we worked to identify cases in which study costs could be reduced by teaming with other entities to conduct studies that met our mutual goals (*e.g*. NEEP, other states, etc.).

Timeline and Input into the 2014 Process

Six points of interaction / Participation with the EEB Evaluation Committee were planned as part of this adopted process:

- Review of prioritization process / input into process
- Discussion of criteria for prioritization process
- Invited to submit / discuss project ideas and perceived research needs
- Review of project idea write-ups, order of magnitude budgets, and initial prioritization
- Evaluation committee presented with recommended package walk-through for review
- Evaluation committee votes on recommended package and associated budget

A timeline of the actual Evaluation Plan development process follows. Considerably more opportunities for input were provided than the originally-approved process. In addition, the process was drawn out for several reasons, largely: a desire to coordinate with NEEP, to allow for one integrated prioritization process; associated delays in getting budgets and scope clarity; and time constraints for discussing the prioritized list at a key evaluation committee meeting.

Table 1: Evaluation Committee 2014-2016 Evaluation Plan Timeline

Date (2013)	Activity
5-Apr	Process proposal posted
9-Apr	Process to Evaluation committee, utilities, consultants
17-Apr	Conference call on evaluation process
17-Apr	Project description submittal forms distributed (deadlines 4/29, 5/24)
26-Apr	Discussions with sub committees / members
5-May	Inventory list distributed to Committee, posted
6-May	Committee meeting discussing document
7-May	Reminder request for submitting forms (due 5/24); distributed several times
4-Jun	NEEP project input (discussions 5/22, 6/4, 6/5, 6/21)
8-Jun	Inventory list distributed to Committee, posted
10-Jun	Committee meeting discussing document

Date (2013)	Activity
3-Jul	Distributed revised, ranked list to Committee, posted
8-Jul	Committee meeting discussing document
19-Jul	Distributed NEEP list
22-Jul	Conference call to discuss NEEP projects
9-Aug	Distributed ranked, budgeted plan
10-Aug	Committee meeting discussing document
4-Sep	Conference call to discuss ranked, budgeted plan by year (distributed)
5-Sep	Conference call to discuss ranked, budgeted plan by year (revisions distributed)
6-Sep	Conference call to discuss ranked, budgeted plan by year
9-Sep	Committee meeting discussing document
13-Sep	Write-up of Draft Plan to Committee
20-Sep to1-Oct	Conference call discussion of Plan write-up; follow-up calls with multiple individuals with questions
2-Oct to 7-Oct	Review of Final Plan by Committee
7-Oct	Voting on Plan by Evaluation Committee and Delivery of Final Plan to EEB (If passed by evaluation committee)
9-Oct	Vote on Plan by EEB

A host of stakeholders, including all the main EEB members had more than four months of opportunity to review the slate of studies proposed with rankings, estimated costs, and comments, and had several opportunities to provide comment and feedback to the Evaluation Consultants. The Evaluation Consultants encouraged input in the form of project ideas, and input related to prioritization, budgets, and timing. There were a multitude of responses from the original project suggestion templates to email comments, discussions during the evaluation committee meetings, reviews of the slate at main board meetings, and several separate conference calls during the four-month development period. Over the four-month period, information was available to the C&I and Residential committees, and the Main EEB board. The Chair of the Evaluation Committee called board and committee member attention to the ongoing plan development and the proposed slate of studies, and encouraged all members to review the slate of studies and provide feedback to the SERA Evaluation Consultant team. The evaluation consultant team took in EEB member feedback, evaluation committee member feedback, and EDC's feedback and made adjustments where necessary to the proposed plan. Leading up to the September 2013 discussion, the Evaluation Consultants staffed a final round of three conference calls (of more than five hours total) to provide a convenient opportunity to obtain a final round of input from all concerned stakeholders.

Per the Roadmap, the majority of the development work and authority for the evaluation plan rests with the independent Evaluation Consultant. The Evaluation Consultant is required to elicit input from EEB Technical Consultants, Evaluation Committee Members, and EDC's. This protocol was adhered to in the 2013 process supporting the development of the 2014-2016 Evaluation Plan.

3. THE RECOMMENDED SLATE OF STUDIES AND EVALUATION BUDGET

The Evaluation Plan is provided in the next several tables. The studies are designed to support the efficiency and evaluation goals and objectives, and the underlying theme is to be able to assess cost-effectiveness of the expenditures of Connecticut energy efficiency funds.

Cost-Effectiveness Link

Cost-effectiveness of program efforts depends critically on three main inputs: net impacts, years the impacts will last, and the incremental costs and investments. The projects proposed provide direct and supporting information related to cost-effectiveness, as described below. The projects are organized into three overarching topic areas:

1) Impact and/or Process Evaluations and Components: This group includes studies of the following types.

   - Impact Evaluation studies: Impact studies are designed to directly measure the savings impacts attributable to programs.
   - Process Evaluations: Process evaluations have a strong basis in identifying efficiencies and improving impact per dollar. They examine aspects of the program's delivery, participation, and satisfaction, with findings related to ways to improve program participation (to improve uptake per expenditure), reduce barriers / improve satisfaction, identify remaining efficiencies in design / delivery, and compare to best practices.
   - Net-to-Gross (NTG) Ratio: NTG provides information on the proportion of the program savings that are above what would have happened in the absence of the program, such as estimating free-ridership and spillover. These factors provide direct information on the degree to which the programs can take credit for measure-related savings. Identifying free-ridership values helps identify measures that may need higher or lower incentives to obtain net savings, whether the efficiency levels included in the program need to be raised, and supporting improvements in the efficiency (and cost-effectiveness) of program design and delivery. Spillover estimates are savings that are induced by the program(s) but are not included in program reported savings. Both free ridership and spillover support more accurate estimates of attributable savings, and thus, cost-effectiveness.
   - Interactive Effects: The estimation of the degree to which measures interact with other measures in obtaining overall energy savings. For example, installing an energy efficiency measure in place of equipment that has a by-product of heat (*i.e.*, incandescent lamps being replaced by CFLs) may lead also to decreased cooling loads, and thus increase peak demand savings for certain measures. These studies, therefore, support a more comprehensive estimation of savings and cost-effectiveness of measures and programs.
   - Load Shapes: Load shapes are critical components in identifying the degree to which the measured savings impacts affect coincident loads, helping identify the most effective and beneficial savings (capacity-related) from programs.
   - Measure Lifetimes: Reliable estimates of measure lifetimes or effective useful lifetimes (EULs) are critical components in determining how long the impacts deriving from the program investments will continue. Measure life is an important input to measure and program cost-effectiveness analyses. Existing measure lifetimes are not well founded

(statistically), the research is often more than 25 years old, and many technologies have changed in ways that can be expected to affect EULs.

2) Market Research and Measure Effects / Performance: This group includes studies of the following types.

- Market Assessment: Understanding the way the current market, actors, and customers (residential and commercial) behave and identifies remaining gaps and opportunities to move the market forward to greater efficiency in cost-effective ways, and can provide information for program refinement, development, and efficiencies.
- Market share / measure tracking: Market share and measure sales and other tracking work provide information on changes in purchases of efficient equipment, standard equipment and what is the market baseline, and can directly and indirectly estimating savings impacts..
- Technology Potential / performance: Accurate information on the effectiveness and efficiency of equipment or measures is fundamental information as input into program design, planning and impact evaluation. This research may include field research, literature review and other testing and analysis on existing and upcoming technologies, with an eye toward identifying ways to help programs deliver higher savings per dollar spent.
- Potential Studies: Potential studies use forecasting, measure adoption curves by cost and evaluation techniques to identify the sectors and measures that show the greatest technical and cost-effective potential.
- Non-Energy Impacts/Non-Energy Benefits (NEIs/NEBs): Businesses and households decide to adopt energy efficiency technology based partly on energy savings and partly based on their assessment of everything else they get from the measures (e.g., maintenance improvements, comfort, the increased need for skilled labor, etc.). Positive NEIs attract people to programs, improving impacts per dollar spent; negative NEIs are barriers that should be assessed and reduced to the extent possible/cost-effective. An assessment of the NEIs can improve the business case to participants and marketing efforts of the programs.

3) Evaluation Methods and PSD-Supporting Information: This group includes studies of the following types.

- Evaluation methods/practices: These projects assure that the Connecticut programs and initiatives are evaluated using the best practices for assuring defensible, reliable/replicable, affordable/cost-efficient methods. In some cases, the studies address difficult research issues (approaches for non-metered energy sources); in others, the studies undertake new and more efficient / effective data collection approaches to support the evaluation work (real-time or on-going data collection).
- Incremental Cost: Incremental costs (the cost of efficient measures and installation above those for standard measures) are a key input to cost-effectiveness analyses. Very large data sets are needed to develop reliable incremental cost data, and there are currently few regional sources for these data. Because of the high cost, we have looked for economies in providing these data by participating in regional studies (NEEP).
- Appropriate Regional Support: Several studies provide financial support for work that directly moves the baseline forward to achieve greater savings (work on codes and standards, etc.), which can be very cost-effective initiatives for efficiency.

- PSD-Support: Several of the studies focus on closing the loop between evaluation and program reported savings. These studies provide recommendations on the best available values for key elements in PSD computations and assumptions.

Link to Goals & Objectives

The phased slate of studies was selected with a strong eye toward the State's Energy Efficiency Goals and objective. For example:

- Traditional evaluations for regulatory purposes: including impact and process evaluations for all the major Connecticut Programs in the Residential, Low Income, and C&I portfolios on 2-3 year cycles.
- Evaluations that seek near real-time feedback: including incorporation of a new process for quarterly surveys of program participants to gather information on net-to-gross and process information closer to the time of participation / measure decision-making, rather than perhaps 2 years down the line.
- Identification of innovative approaches and best practices, options for continuous improvement, and exploration of "next" opportunities: examining the potential of wireless thermostats / technologies; consumer electronics potential; emerging technologies research, and other studies; and gas and other potential studies.
- Focused on actual building energy performance to support improvement: Assessing high performance commercial lighting; detailed review of performance in existing commercial buildings; ductless mini-split performance results; large projects evaluation
- Develop market understanding to support development of appropriate, effective, and tailored programs and improvements: Market assessments for domestic water heating; market assessments and opportunities / barriers for the Home Energy Solutions (HES) / HES-IE (HES – income eligible) program; C&I financing market research, market research on EE investments over time vs. deep savings; early process evaluation of new / major changes for Strategic Energy Management (SEM); and analysis of barriers related to asbestos and mold.
- Leveraging (CEEF) funding for greatest value and robustness of the research, and evaluation of allied initiatives: multi-client studies including Consortium for Retail Energy Efficiency Data (CREED) and work on wireless thermostats and multiple regionally-supported studies by NEEP.
- Exploration and adoption of effective protocols for documenting savings and practices: Deemed savings analyses; advanced market share tracking; lighting interactive effects, net-to-gross studies; loadshape research; incremental cost estimation work; persistence and measure life work; treatment of non-metered fuels in impact evaluation (oil/propane); disconnects between engineering and billing analysis; evaluability assessment
- Counting all of the savings, including those from initiatives related to codes and standards, and market improvements in the design/construction trades: C&I new construction baseline and code compliance; residential codes and standards research on direct and indirect effects
- Exploration of elements of the broader business and sustainability case and acknowledgement of the broader benefits from the State of Connecticut's efficiency investments and practices: including studies of net-to-gross; non-energy impacts; and large project evaluations, among others.

Roll-up of Evaluation Budgets

Tables 2 and 3 summarize the budgets and number of evaluation projects by sector, project type, and year. Table 4, Table 5, and Table 6 identify the evaluation projects and budgets by year. Attachment A provides brief descriptions of the individual projects.

Table 2: Summary of Evaluation Budget for 2014-2016 (in thousands of dollars)

SUMMARY - BUDGET	2014	2015	2016	Total	Percent
Residential Impact and/or Process Evaluations & Elements	$610	$748	$728	$2,086	18%
Residential Market & Measure Effects / Performance	$314	$775	$475	$1,564	13%
Residential Evaluation Methods & PDS-Supporting Information	$352	$151	$160	$663	6%
Commercial Impact and/or Process Evaluations & Elements	$1,579	$1,977	$2,451	$6,007	51%
Commercial Market & Measure Effects / Performance	$745	$283	$300	$1,328	11%
Commercial Evaluation Methods & PSD-Supporting Information	$89	$16	$16	$121	1%
Total Residential	$1,276	$1,674	$1,363	$4,313	37%
Total Commercial	$2,413	$2,276	$2,767	$7,456	63%
Grand Total	$3,689	$3,950	$4,130	$11,769	100%

Table 3: Summary of Evaluation Project Count for 2014-2016

SUMMARY - PROJECT COUNT	2014	2015	2016	Total	Percent
Residential Impact and/or Process Evaluations & Elements	7	6	4	17	20%
Residential Market & Measure Effects / Performance	8	14	4	26	31%
Residential Evaluation Methods & PDS-Supporting Information	6	5	5	16	19%
Commercial Impact and/or Process Evaluations & Elements	3	6	5	14	17%
Commercial Market & Measure Effects / Performance	3	1	1	5	6%
Commercial Evaluation Methods & PSD-Supporting Information	3	1	1	5	6%
Total Residential	21	25	13	59	71%
Total Commercial	9	8	7	24	29%
Grand Total	30	33	20	83	100%

Table 4: List of Evaluation Projects for 2014 (Budgets in Thousands)

ID #	Project Name	Budget 2014
RESIDENTIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
97	Carryover for 2013 Residential Impact / Process Studies Underway	$150
24	HES Net-to-Gross Analysis (carry-over funding as part of 2013-2014 Process evaluation interviews)	$60
86	Residential Lighting NTG	$300
67	Lighting Interactive Effects Study (CT, not NEEP version)	$25
61	Loadshape Research - Primary Research / Estimation / Development (NEEP)	$30
32	CL&P Behavior Year2 Persistence Add-on	$20
88	Measure Life Study - Estimation-based (NEEP) with initial literature work to prioritize needs / gaps	$25
RESIDENTIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
48	Market Assessment/Literature Review/Performance Evaluation for Incorporation of High Performance Measures into HES/Res Programs	$30
84	Consumer Electronic Market and Potential Study	$28
82	CREED participation - Lighting Data	$10
109	REED Database - Regional Energy Efficiency Database (NEEP)	$8
38	Field test of wireless thermostats / technologies	$100
73	Ductless Mini-Split Performance Results - Meta Study (NEEP)	$10
14	Societal Non-Energy Impacts - Economic and Environmental NEIs/NEBs. (NEEP Supporting Economic / Jobs Part)	$3
108	Studies To Be Identified - including Market Research, Baseline, and Outer Year	$125
RESIDENTIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
31	Real-time data collection / telephone surveys with program participants to feed impact/process evaluation work	$76
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$14
91	Addressing Disconnects between Engineering and Billing Analysis (CT proposed to NEEP)	$8
51	Codes & Standards - Examine Potential Savings from Past & Future Program Activity	$200
78	Appliance Standards Support (NEEP)	$8
92	NEEP Baseline Costs - CT Contribution	$46
COMMERCIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
101	ECB Process & Impact Evaluation (incl. info for program marketing, NEI)	$1,400
100	SBEA Process Evaluation (incl. info for program marketing, NEI)	$150
60	Loadshape Research - Catalog / Secondary Research (NEEP)	$29
COMMERCIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
10	New Construction Baseline & Code Compliance	$650

ID #	Project Name	Budget 2014
83	C&I Financing Market Research	$20
52	Assess Lighting Structure for Capability Regarding High Performance Lighting	$75
COMMERCIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
104	Detailed review of C&I PSD existing bldgs, FR&SO, loadshapes and its use	$50
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$14
105	Evaluability assessment of new/major program changes for Strategic Energy Management	$25

Table 5: List of Evaluation Projects for 2015 (Budgets in Thousands)

ID #	Project Name	Budget 2015
RESIDENTIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
111	Residential New Construction Impact and Process Evaluation (with potential for NEB & NTG analysis)	$320
46	Energy Efficiency Financing Evaluation, addressing effects / improvement of financing initiatives	$65
45	Market Assessment/ HPWH and Water Heating Impact and Process Evaluation	$144
113	Ductless Heat Pump Impact Evaluation	$155
61	Loadshape Research - Primary Research / Estimation / Development (NEEP)	$38
88	Measure Life Study - Estimation-based (NEEP) with initial literature work to prioritize needs / gaps	$26
RESIDENTIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
26	HES Market Assessment	$41
28	HES-IE Market Opportunities and Barriers	$41
84	Consumer Electronic Market and Potential Study	$253
80	Gas Potential Study - Natural Gas in New England (NEEP)	$31
89	Advanced Market Share Tracking (NEEP)	$23
82	CREED participation - Lighting Data	$10
109	REED Database - Regional Energy Efficiency Database (NEEP)	$8
64	Emerging Technologies Primary Research (NEEP)	$31
38	Field test of wireless thermostats / technologies	$103
30	Potential for Asbestos and Mold Abatement (Not NEEP; Maybe in future)	$41
71	Behavioral Programs and their results - Meta Evaluation (NEEP)	$8

ID #	Project Name	Budget 2015
110	Non-energy impacts assessment - Participant Beneficiaries Analysis (not Societal or Utility Sectors)	$40
14	Societal Non-Energy Impacts - Economic and Environmental NEIs/NEBs. (NEEP Supporting Economic / Jobs Part)	$20
108	Studies To Be Identified - including Market Research, Baseline, and Outer Year	$125
RESIDENTIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
31	Real-time data collection / telephone surveys with program participants to feed impact/process evaluation work	$50
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$16
90	Oil / Propane Treatment in Impact Evaluation (CT proposed to NEEP)	$30
78	Appliance Standards Support (NEEP)	$8
92	NEEP Baseline Costs - CT Contribution	$47
COMMERCIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
57	Process Evaluation & Market Research of the Integration of Financing and C&I Efficiency Programs	$268
41	EO process and impact Phase 1 (2015) & Phase 2 (2016); (incl. info for program marketing & NEI)	$670
36	Large Projects Evaluation	$412
102	SBEA Impact Evaluation	$525
106	Early process eval of new/major program changes for Strategic Energy Management	$77
103	C&I Measure Life - update PSD & assess need for other C&I Measure Life studies (Possible NEEP)	$25
COMMERCIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
107	Market Research on EE Investments Over Time versus Deep Savings at Once	$283
COMMERCIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$16

Table 6: List of Evaluation Projects for 2016 (Budgets in Thousands)

ID #	Project Name	Budget 2016
RESIDENTIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
34	HES and HES-IE Impact and Process Evaluation	$398
99	HER / or other Behavioral Programs Impact & Process Evaluation Study	$265
61	Loadshape Research - Primary Research / Estimation / Development (NEEP)	$38
88	Measure Life Study - Estimation-based (NEEP) with initial literature work to prioritize needs / gaps	$27

ID #	Project Name	Budget 2016
RESIDENTIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
48	Market Assessment/Literature Review/Performance Evaluation for Incorporation of High Performance Measures into HES/Res Programs	$106
82	CREED participation - Lighting Data	$11
109	REED Database - Regional Energy Efficiency Database (NEEP)	$8
108	Studies To Be Identified - including Market Research, Baseline, and Outer Year	$350
RESIDENTIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
31	Real-time data collection / telephone surveys with program participants to feed impact/process evaluation work	$50
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$16
25	HES and HES-IE Deemed Savings Recommendations and updated measure information for PSD	$37
78	Appliance Standards Support (NEEP)	$8
92	NEEP Baseline Costs - CT Contribution	$49
COMMERCIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS		
101	ECB Process & Impact Evaluation (incl. info for program marketing, NEI)	$1,484
100	SBEA Process Evaluation (incl. info for program marketing, NEI)	$159
53	ECB - Strategy for advanced commercial building & renovation design	$133
41	EO process and impact Phase 1 (2015) & Phase 2 (2016); (incl. info for program marketing & NEI)	$644
60	Loadshape Research - Catalog / Secondary Research (NEEP)	$31
COMMERCIAL MARKET AND MEASURE EFFECTS / PERFORMANCE		
98	Studies To Be Identified - including Market Research and Outer Year	$300
COMMERCIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION		
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	$16

Additional Information and Next Steps

Traditionally, the Plan is presented as project titles and budgets, meeting the Roadmap requirements. This Plan incorporates an appendix with some additional supporting information – most importantly, the summaries of included studies and available NEEP study information -- for interested readers (in a separately-bound Attachment A). The detailed development of project scopes are the responsibility / purview of the independent Evaluation Consultants, with input requested from the EEB Evaluation Committee, and will be conducted starting Fall 2013 through the end of 2016, following the guidelines from this Plan. That scope development process is not part of this document and is conducted in a stage distinct from this Evaluation Plan Development process.

Periodically through the three-year period of the Plan, updates and refinements may be needed. The Evaluation Consultants intend to undertake a detailed evaluation planning process every other year (similar to the process for this Plan), with true-ups and updates in the intervening years. For example, if initial meetings on specific NEEP projects make it clear the scope will not cover priority objectives for Connecticut; we will cease participation in those studies. As the work progresses, where the Evaluation Consultants can identify economies in study performance (*e.g*. through more efficient methods, combining project efforts, partnering with other agencies, etc.), but maintain study result integrity, we will continue to bring those refinements forward, as we do now. Similarly, we will work to remain responsive to high priority new initiatives and programs, legislative changes, and other factors, but recognize that this Plan was developed to support our underlying responsibility to assure third-party independent evaluation of the State's energy efficiency initiatives are performed that assure cost-effective and defensible expenditure of State funds.

Attachment A: Project Descriptions

Sheet #	Project Name	Short Summary of Project	Why Priority
RESIDENTIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS			
34	HES and HES-IE Impact and Process Evaluation	The study is a comprehensive impact evaluation, based on billing analysis, and a process evaluation of HES using participant and non-participant surveys in the HES and HES-IE programs. The study is designed to provide a robust evaluation and savings results generalizable to future years, significant ways to improve the program, and insight into measure cost-effectiveness. An assessment of financing elements are incorporated as a focus as part of the traditional process evaluation work.	The HES program is critical to meeting Connecticut goals, particularly weatherization, and the most recent evaluation is some years old and not ideally executed. Added in HES-IE for efficiencies.
111	Residential New Construction Impact and Process Evaluation (with potential for NEB & NTG analysis)	The impact evaluation is planned as a billing analysis to estimate energy and demand savings. The CT RNC Program allows for participation at several tiers of stringency with commensurate higher savings. Once a builder has made the decision to participate, what are the barriers to participating at higher tiers? Given that many RNC participants are low/moderate income housing development are there possible policy-driven solutions for some subsets of participants? How can the lessons from the Companies' successful Zero Energy Challenge competition inform these efforts? The project may also address renewable readiness and renewable integration with RNC efficiency efforts. An assessment of financing elements are incorporated as a focus as part of the traditional process evaluation work.	RNC has not had an impact evaluation for years, and the study will provide information on the impact the single-family RNC program is having on energy and demand savings and other factors. It will provide updates estimates in light of recent changes to Connecticut energy code and ENERGY STAR requirements. Moving the program to higher tiers will yield greater program and participant savings
99	HER / or other Behavioral Programs Impact & Process Evaluation Study	The project will include a billing analysis using treatment and control groups to estimate net savings impacts associated with the program(s). In addition, a process evaluation, using surveys / interviews and document review will be conducted. The work will provide defensible / reliable estimates of program impacts, and findings useful for the revision / refinement of the program design and implementation. We recognize that the current HER program may or may not continue in its current form; this project evaluates the program or its successors.	Cycles have been established to have impact and process evaluations conducted every 2-3 years, and this program will be due. The program Is an important part of the residential portfolio, responsible for delivering significant savings.
97	Carryover for 2013 Residential Impact / Process Studies Underway	These studies are a priority. This budget / project covers the elements of the HES/HES-IE impact / process studies are currently underway (and associated presentations) that will carry-over into early 2014	This covers the budget for elements of the high priority HES/HES-IE impact / process studies currently underway (and associated presentations) that will carry-over into early 2014

Sheet #	Project Name	Short Summary of Project	Why Priority
46	Energy Efficiency Financing Evaluation, addressing effects / improvement of financing initiatives	CT offers an array of financing incentives. The HES (EE Payment Plan and Comprehensive EE Project Loan) and Smart-E loan products will be evaluated in other projects. This project evaluates the financing products not covered by these programs, potentially working jointly with other agencies, and looks across programs to find ways to improve the financing efforts to attain more measure conversions. The evaluations will be coordinated so that they are evaluating the same research questions with comparable evaluation methods. Questions include: How critical are robust finance offerings to achieving more measure implementation and deeper savings? How can CT's finance offerings be improved to increase major measure implementation? The study addresses the array of financing initiatives in the programs, beyond RNC & HES / HES-IE (which are addressed in other process evaluations) but brings together / integrates their results.	CT financing has not been a major driver of program activity. It is important to assess the performance of the current portfolio of residential financing incentives –and this project reviews the package, integrating results from the financing analysis in the HES evaluation and the RNC evaluation along with those financing elements that are not directly covered by those evaluations. Key questions include what attributes of the loan product and/or the underlying program offerings contribute and how can financing efforts be improved to attain more measure installations – and improve the cost-effectiveness of programs.
45	Market Assessment/ HPWH and Water Heating Impact and Process Evaluation	This project conducts a market assessment and process evaluation of CT's DHW efforts. The project will focus on identifying ways to capture more of the available energy savings in this sector. CEEF has supported efficient gas water heating for several years and more recently has extended its support to HPWHs. General indications are that program activity, particularly for gas water heaters, is moderate at best. What are the DHW market channels, and product flows through them? Who are the specifiers, purchasers, and decision makers in regards to product type and efficiency? Are program efforts properly addressing these opportunities, including those made available when a fuel conversion occurs? How can the 2015 federal DHW standard best be leveraged to move the rest of the market to HPWHs and to high efficiency gas DHW? For HPWHs: what are the energy and demand savings? Can we quantify interaction with space conditioning loads and how do these impacts vary by location? Are these units being properly installed and in the correct locations? How well have recent upstream efforts succeeded?	After space heating, DHW is the second largest energy end use in the home. We should be able to capture more of the available market and energy savings

Sheet #	Project Name	Short Summary of Project	Why Priority
113	Ductless Heat Pump Impact Evaluation	The primary goal of the study is to estimate energy and demand impacts of the Ductless Heat Pump program, primarily based on onsite metering. In addition, the study includes a market assessment based on a small number of interviews with participating contractors and customers. Impact evaluation of CEEF's ductless split heat pump efforts to displace existing space heating system use. Connecticut has been a regional if not national leader in promoting the use of ductless split heat pumps to displace resistance space heat. Have these units performed as expected? Have customers properly managed the operation of these units in conjunction with their existing resistance or fossil fuel space heat to maximize the benefits of the DSHPs? Have the units provided the expected low temperature performance? How much additional summer energy use and peak demand is being added? Are there any lessens that are transferable to the use of DSHPs to displace oil and propane heat to help CT meet its longer term greenhouse gas reduction goals?	Ductless heat pumps are an emerging technology with a good opportunity for energy savings, and there has not been an assessment of the technology since initial RLW pilot study in 2009. The results of this evaluation will inform the design of the DHP program. CT is a regional / national leader in promoting this technology. The technology may also play a key role in meeting state's climate change goals as a fossil displacement technology
24	HES Net-to-Gross Analysis (carry-over funding as part of 2013-2014 Process evaluation interviews)	This funds the NTG component of the planned 2013-2014 process evaluation of the project, adding a set of questions to the process surveys being developed (for efficiencies / project savings). We expect to conduct participant and trade ally surveys to determine impacts associated with net-to-gross effects, such as freeridership and spillover using state-of-the-art methods (questions and computations) for calculating the NTG components.	To our knowledge, it has been some time since a NTG study was performed for this program; given its importance to the portfolio, a current estimation of net impacts is in order to provide improved estimates of the program's cost-effectiveness.
86	Residential Lighting NTG	Evaluation would use multiple methods to estimate NTG and to assess any additional opportunities for lighting savings (e.g., understanding the LED market). Research would be coordinated with MA, providing economies of scale. Given that lighting will contribute less in future program years and rapid changes in current market the initial research will be conducted in 2014, with the potential for additional research in 2015 or 2015.	CT has not performed a NTG study for standard CFLs since 2009 and to our knowledge has never estimated NTG for specialty CFLs or LEDs. The many changes in the market and EISA make this an important study.
67	Lighting Interactive Effects Study (CT, not NEEP version)	The research will leverage the significant work that has already been done to collect market penetrations of various HVAC technologies, building shell characteristics and run times for both the lighting and HVAC measures impacted. The analysis will also leverage the existing building simulation modeling work to estimate interactive effects	Interactive effects are examined for most lighting programs now around the country, but have not been estimated specifically for CT.

Sheet #	Project Name	Short Summary of Project	Why Priority
61	Loadshape Research - Primary Research / Estimation / Development (NEEP)	Primary research to identify loadshapes that are as regionally-appropriate as possible. Loadshape Research Primary Research / Metering Studies (NEEP): The purpose of this project is to fill data gaps in the region. The deliverable, as with previous Forum loadshape research efforts, would be 8760 loadshape with peak coincidence factors and spreadsheet "tool" that allows users to calculate customized factors for one measure type. The project would leverage costs, sampling efforts, and previously collected data across multiple funders. The studies are designed to satisfy PJM and ISO-NE M&V requirements. In 2014, selection of the measures to study will be informed by subcommittee needs and interests; for example, HPWH will be explored as one option.	Loadshapes are expensive to obtain (very data / metering intensive), but they are important to estimating impacts, potential, and cost-effectiveness. A "Shareable" database / inventory would be a valued resource.
32	CL&P Behavior Year2 Persistence Add-on	The evaluation will include a billing analysis sometime in 2014 to examine persistence of savings from behavioral modification program. The methods would be very similar to those used in Year1 analyses and that will be applied in already approved Year2 study, but this add-on will allow for estimation of persistence for average energy users. Current persistence only provides information on high users due to study design.	The examination of persistence will allow us to see how long savings persist after treatment ends for households with average pre-program energy use; current work on persistence provides such information only for high use customers. This study was requested during the Technical meeting on CL&P year 1.
88	Measure Life Study - Estimation-based (NEEP) with initial literature work to prioritize needs / gaps (note this is 2 NEEP projects)	The purpose of this project is to improve measure life estimation in the region. Measure lifetimes are a key input to all benefit-cost computations for programs and measures, but, although impact estimates are well-researched, few of the EULs (estimated useful lifetimes) used are derived from defensible sources / methods. This project addresses two key issues – defensible EULs, and another important topic, remaining useful lifetime. The earliest phase of the NEEP project will involve work by the Committee to select the target measures. The second phase of the work (a 2nd NEEP project) conducts primary research to develop defensible measure lifetimes for priority measures. The 2014 project is an extension of a 2013 project (supporters were MD, DC, CT, MA, RI, VT). The report will include estimates of measure life for equipment replacement projects for one or two measure categories. The 2014 project will conduct in-depth surveys of program participants who qualified for early replacement incentives and gain a better understanding of the factors that influence equipment replacement decisions, early replacement of existing equipment with more efficient equipment, examine existing equipment life, new equipment life, and other information used to estimate remaining useful life or to qualify measures, such as the efficiency of the existing equipment. Baseline assumptions pertaining to future efficiency standards or other factors that determine the timing and efficiency of "normal replacement" will also be	Measure lifetimes are a key input to all benefit-cost computations for programs and measures, but few of the EULs (estimated useful lifetimes) are well- or statistically-derived. In addition, the EULs being used are often more than 25 years old, and in some cases, measure technologies have changed in ways that affect lifetimes. This study produces defensible measure lifetimes for priority measures, with more to follow in later years. The project also researches a very hot topic in EULs, remaining useful lifetime, which concerns many early replacement-focused programs.

Sheet #	Project Name	Short Summary of Project	Why Priority
		documented. This combines 2 NEEP projects that are sequenced.	
RESIDENTIAL MARKET AND MEASURE EFFECTS / PERFORMANCE			
26	HES Market Assessment	This effort will be aimed at identifying the current state of HES retrofit market, including equipment saturations and fuel shares, existing efficiency levels, and participant segmentation.	Help to understand the market for the measures included in the HES program, including actors, measures, drivers, opportunities, etc. and can help inform program refinements, and improve the delivery, targeting, measures, and other elements of the program to improve cost-effectiveness.
28	HES-IE Market Opportunities and Barriers	Using billing, program, census, and other data, the study will identify the high need areas, calculate energy intensities, and consider where to target program resources for the most effective program delivery (thus maximizing program savings).	The outcomes can help to target the resources of this program to where they are most needed, including reaching out to underserved populations. HES-IE is a high demand program, but it has limited resources; this can help in the identification of the most efficient allocation of those resources.
48	Market Assessment/Literature Review/Performance Evaluation for Incorporation of High Performance Measures into HES/Res Programs	The project would first include a benchmarking study to compare to programs similar to HES and assess impacts of program components. The study would then include an impact evaluation if new program components were added to HES (or if ever added as stand-alone program).	This project will provide information regarding potential savings from new program components/measures that could be integrated into HES. So important to see if other program components/measures could be added to HES.
84	Consumer Electronic Market and Potential Study	The evaluation will be a two-step process. First, the evaluation will examine available literature and perform in-depth interviews to scope what primary research, if any is needed. The study then may include a saturation study to determine detailed program savings potential for consumer electronics and identify best practices for such programs.	Consumer electronics are a growing industry and account for the fastest growing proportion of residential electricity load.
80	Gas Potential Study - Natural Gas in New England (NEEP)	Potential Study Natural Gas in New England (NEEP): The purpose of this project is to develop estimates of economic and achievable potential natural gas energy efficiency in the New England region over a 10-20 year horizon, for several planning scenarios informed by projections of gas demand and gas infrastructure, and by results of the 2013 NESCOE gas forecasting project. The report on results would enable stakeholders within the region to comprehensively examine gas efficiency potential and how that can impact and reduce costs for pipeline expansion or deferring projects.	Due to decreasing avoided costs, new standards, and limited end-uses, gas savings are getting more difficult to achieve. This study will help assess how much potential remains for gas savings, and where this potential exists.

Sheet #	Project Name	Short Summary of Project	Why Priority
89	Advanced Market Share Tracking (NEEP)	Advanced Market Share Tracking (NEEP): The purpose of this project is to help advance progress towards the goal of increased availability and use of market share tracking of key products which are elements of energy efficiency programs. The deliverable would include technical review, communications, and participation in working group activities that advocate for development and dissemination of market share tracking data reports on relevant end uses. The initial focus would be on appliances, lighting, electronics, and others as determined by the subcommittees. NEEP would serve as liaison to the newly formed Retail Action Council	Market share data is critical to measuring the impacts of retail programs, but is expensive / unrealistic for any one program or evaluation to collect.
82	CREED participation - Lighting Data	Participation in the Consortium for Retail Energy Efficiency Data (CREED). CREED is a consortium of program administrators, retailers, and manufacturers working together to collect the necessary data to better understand lighting decision making and purchase patterns - uses 3rd party agents to collect market point of purchase data on lighting, and helps assess impacts related to EISA	Having POS data will be important for retrospective attribution analysis, plus prospective LED market effects. Even with savings from lighting programs decreasing, need to know where the remaining opportunities lie, and POS data will serve this purpose.
109	REED Database - Regional Energy Efficiency Database (NEEP)	The NEEP REED project (Regional Energy Efficiency Database) will be guided by priorities set by the REED committee. The project updates and maintains the database established over the last few years. The project incorporates program year 2013 data, potentially new report features, additional data elements, and an Annual REED Report. The project will collect program year 2013 data from all 10 states in the Forum region, and continue to work with other EE data collection efforts (by CEE, LBNL, ACEEE and others) to use consistent definitions for key terms (such as program types), continue to coordinate data collection with ISO-NE, and explore similar coordination with NYISO and PJM (supporting air regulators' data needs). The project will produce an Annual REED report based on the two years of available data (2011 and 2012), add enhanced report features, and collect new data elements (potentially measure-level data).	The database provides easily accessible data for benchmarking and identifying best practices for similar regional programs. Economies are realized as the project will be working with other EE data collection efforts (by CEE, LBNL, ACEEE and others) to use consistent definitions for key terms (such as program types), will coordinate data collection with ISO-NE and explore similar coordination with NYISO and PJM (supporting air regulators' data needs). The committee determines directions / priorities for the project.
64	Emerging Technologies Primary Research (NEEP)	Emerging Technologies - Primary Research (NEEP): The purpose of this project is to respond to program administrators' needs related to pursuing increasingly aggressive energy savings targets, which has led to a growing interest in new energy savings opportunities from emerging technologies, given that primary research into savings potential from emerging technologies can be expensive and difficult at the PA level. The deliverable will be summary reports on results of primary research on the selected emerging technology. The proposed 2014 project scope would be selected with subcommittee input.	Need to keep up front on emerging technologies to keep pushing the envelope in sources for savings that are feasible and cost-effective in the state.

Sheet #	Project Name	Short Summary of Project	Why Priority
38	Field test of wireless thermostats / technologies	This new generation of thermostats holds the possibility of significant energy savings across all homes- a few percent x all homes could equal a significant gas and electric efficiency resource. This study will include a series of field tests to assess energy and demand savings from (1) wireless thermostats controlled by owners, (2) wireless thermostat with added energy management features such as simplified programmability, learning motion sensor, and outdoor temperature cut out (for heat pumps), (3) test added demand management services offered by some thermostat providers. This would require a staged series of tests that would take 2-3 years, but would help clarify incremental value of added features. The simplest evaluation would use pre/post billing data; an enhanced study could use smart meter data and/or data provided by tstats themselves (through coordinated evaluation with providers) for impact evaluation. Customer surveys will provide information on satisfaction, comfort impacts, and to help understand interactions with Tstats. Alternative research designs could also employ on/off tests; detailed design should consider alternatives.	The study will assess potential savings from a new generation of intelligent home thermostat that has shown considerable promise in early research. The study will be based on real-world field data, leveraging with work from a few other participant states, if possible. This new generation of thermostats holds the possibility of significant energy savings across all homes- a few percent x all homes could equal a significant gas and electric efficiency resource, and the research is important to assess the performance and cost-effectiveness of savings from the technology (including variations by type of program / delivery method).
73	Ductless Mini-Split Performance Results - Meta Study (NEEP)	This NEEP study will be conducted as a meta-study, identifying the latest information from studies conducted regionally and nationally. The work will focus on understanding and updating impact / market / performance assumptions for existing and evolving technologies.	This meta-study of ductless Heat Pumps / mini-splits (NEEP) is to update states on this rapidly evolving technology, including new products (e.g. multi-head cold climate systems and integrated controls) that are coming onto the market within a year. The report will provide latest information on impact / market / performance assumptions (and relative cost-effectiveness) of this important / growing technology.
30	Potential for Asbestos and Mold Abatement (Not NEEP; Maybe in future)	The study would examine the feasibility and cost effectiveness of assisting consumers with asbestos and mold abatement in order to increase adoption of HES and HES-IE measures such as insulation. Separate analyses would be provided for both versions of the program, given their different incentive structures.	About 13% of single family homes visited as part of the weatherization baseline study had either asbestos or mold concerns. This dramatically limits the HES and HES-IE services they can receive. Abating these measures would allow additional homes to be treated through the programs, thereby facilitating the state's goal of reaching 80% weatherization by 2030.

Sheet #	Project Name	Short Summary of Project	Why Priority
71	Behavioral Programs and their results - Meta Evaluation (NEEP)	Behavior Programs - Share Research Results / Meta Study (NEEP): P.A.s across the country are increasingly relying on residential behavior programs to substantially contribute to energy savings goals. Various approaches to targeting and marketing have been used. Vendors of these programs have proliferated. There is a growing volume of evaluations of their results. This meta-study will collect evaluations conducted for behavior programs (with a focus on the Northeast) and synthesize results and lessons learned about impacts and methods for evaluating these programs. The project will provide a white paper on the types and performance of programs of different types, as well as an informational webinar.	Behavioral programs are getting more attention - their performance hasn't been well documented and need to be reviewed to determine their cost-effectiveness potential and potential role in portfolios in CT. Also need to understand potential impacts from commercial behavior programs. We will have a role in determining the focus of the research to meet CT priorities.
110	Non-energy impacts assessment - Participant Beneficiaries Analysis (not Societal or Utility Sectors)	The survey and measurement work will provide a quantification assessment of the positive and negative effects that participants realize / recognize from efficiency program participation. Incorporating NEI analysis provides more useful information on attractive features and barriers that can be used to inform effective outreach and program design elements, and progress on policy-related goals (especially for IE customers). Depending on priorities, payments analysis may be included (arrearage analysis) to explore impacts on household hardship (disconnects, etc.) and utility impacts (carrying costs, etc.). The bulk of the NEI estimates are derived from specialized questions added to the process evaluation surveys, leading to only marginal increases in costs, but more robustness in the process evaluation results. This analysis excludes economic / job and environmental / societal NEIs.	Non-energy impacts are omitted impacts that measure elements related to satisfaction, barriers, program outreach, etc. in ways that can be used to develop implementable recommendations regarding program refinements to increase participation, which improves cost-effectiveness. NEIs are especially important for low income programs, since elements beyond simple energy savings (including hardship benefits, etc.) are commonly part of program goals. For cost-effectiveness, the project assumes the data collection will be integrated into survey work conducted as part of process evaluations.
14	Societal Non-Energy Impacts - Economic and Environmental NEIs/NEBs. (NEEP Supporting Economic / Jobs Part)	The NEEP project to estimate jobs-related NEIs will (most likely) use IMPLAN or REMI or other vetted input-output models to develop regionally-appropriate estimates of the multipliers association with investment in energy efficiency. These analyses will allow quantification of impacts in terms of dollar amounts, which can then be added to cost-effectiveness assessment, and provide feedback to the State on a fuller assessment of program effects. The results can also be used to explore adders (like other states), etc. The purpose of this project is to employ one methodology (selected with regional input or consensus) to develop current estimates of job impacts at the regional and state levels. Later phases may explore estimation of environmental impacts, examining effects like reduced emissions associated with offset generation, as well as other environmental effects (e.g., water-savings, landfill reduction). The deliverable from this research will include results that can be used as inputs to REED, as well as a report that can inform regional energy policy discussions and can provide a comparison with any available results from various program administrators' existing job impact studies. This multi-	The impacts of NEBs are more complicated -- and more reliably estimated -- than the current expressions used, which are in terms of added cost per kWh. This provides updated figures, estimated with a reliable, regionally acceptable modeling method, and provide economies in the development of these estimates.

Sheet #	Project Name	Short Summary of Project	Why Priority
		year project is one where NEEP would seek leveraging other funding sources.	
108	Studies To Be Identified - including Market Research, Baseline, and Outer Year	The study methods will depend on the project needs.	Addresses priority needs that inevitably arise -- from rulings, program results, or other sources.
RESIDENTIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION			
31	Real-time data collection / telephone surveys with program participants to feed impact/process evaluation work	Evaluations often contact participants a year or two after they participated in the program; participants' ability to recall program procedures, their own decision making process, and the program's impact on their other behavior becomes less reliable as time after participation passes. The study will review surveys currently conducted by utilities and identify coordination opportunities. Leveraging off successful efforts in the Northwest, the study will develop survey instruments that would be delivered every three to six months to program participants. The survey would include a core group of questions focused on such things as program experience and satisfaction, the decision-making process, and motivations to participate in order to track such critical indicators as satisfaction, net impacts, etc., -- data necessary to support process and impact evaluations. Proper survey staging to gather information like spillover will also be explored.	Evaluations often contact participants a year or two after they participated in the program; compromising the reliability of critical data used in important process and impact evaluations. This study provides on-going and closer-to-real-time data that improves the information. Coordination with other utility efforts will also provide potential economies in the survey work.
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	Incremental Cost Estimation (NEEP):NEEP description. As with previous Forum Incremental Cost studies, the purpose is to develop incremental cost estimates and cost curves (costs at varying efficiency levels) for measures and/or program types (gas and/or electric) beyond those previously studied. The deliverable will be cost curves and worksheets and a summary report. The 2013 project budget will not cover all of the measures that are under consideration for study. It is appropriate to continue this project to study incremental costs of common prescriptive measures, and of new/emerging measures, and to update costs periodically as markets change. Unlike some other aspects of efficiency measures, data on costs of baseline and efficient measures can be difficult to obtain and are likely to be similar within sub-regional markets rather than obeying state boundaries. Development of cost curves rather than measure by measure estimates is more economical and flexible. The Forum is well-suited to apply a consistent analytical method across jurisdictions.	Incremental costs are expensive to obtain, but important to estimating impacts, potential, and cost-effectiveness. Very useful to be able to have more regionally-appropriate sources than DEER, etc.

Sheet #	Project Name	Short Summary of Project	Why Priority
25	HES and HES-IE Deemed Savings Recommendations and updated measure information for PSD	This effort is aimed at updating measure information in the PSD, including developing assumptions specific to program participants and adding measures not currently included. This work will be informed by the impact evaluation, which will help refine assumptions specific to participants and measures offerings for each HES and HES-IE programs.	After perhaps two reliable impact evaluations of the HES programs are completed, this study examines patterns in the findings, and develops updated assumptions for use in the PSD. The study will help to update savings assumptions for these important programs, including assumptions that may differ between HES and HES-IE
91	Addressing Disconnects between Engineering and Billing Analysis (CT proposed to NEEP)	Impact evaluations conducted using different methods can conceivably deliver different results. This study conducts literature reviews, interviews, and case study analysis of specific projects (local and nationwide) to explore whether / how often differences in impact results arise between billing vs. engineering analysis approaches. The project examines alternatives and justifiable best practices for instances when two different impact evaluation methods develop different estimates of attributable savings. Proposed by CT; may be co-funded by NEEP.	This project addresses a key question in evaluation research to improve methods associated with impact evaluations and the estimation of program savings.
90	Oil / Propane Treatment in Impact Evaluation (CT proposed to NEEP)	Impact evaluations using billing analysis for electric and gas usage are fairly straightforward; the methods for non-metered fuels (which are used in CT) are far less studied. The study uses literature review, interviews, and analytical work to examine alternatives and best practices for addressing non-metered fuels in impact / billing analysis.	Impact evaluations of oil and propane-fueled homes are hampered because the fuels are not metered, making usage data unavailable. This study provides a review of alternatives / best practices for Oil / Propane Treatment in Impact Evaluation Work. CT evaluations strive to use the most reliable methods for its evaluation work; there are not well-known best practices for addressing these fuel types, and this study investigates strong alternatives.
51	Codes & Standards - Examine Potential Savings from Past & Future Program Activity	The study will identify appropriate methodologies for C&S savings accounting and attribution from CEEF Program support for codes and standards and market transformation effects. Examples of savings attribution studies including: Massachusetts and California for building codes, Energy Trust of Oregon for federal lighting standards, and Northwest Planning and Conservation Council for codes and overall market transformation initiatives. These studies will be examined first. Recommendations will also examine opportunities for CT specific codes (e.g., for appliances).	The CEEF programs have played a significant role in supporting national and State codes and standards. Currently the CEEF Programs do not document these savings let alone make any reasonable claim for them. In order to make effective policy, regulatory and program design decisions, it is critical for Connecticut to have a clear understanding of the direct and indirect contributions of the CEEF Programs to Connecticut's overall strategic energy efficiency goals.

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78	Appliance Standards Support (NEEP)	Appliance Standards Support (NEEP): The region's EE and environmental goals benefit from improvements in federal standards, and PAs are uniquely qualified to help inform the research to advance standards. These can be some of the most cost effective programs, and changes in standards have a large influence on baselines. The purpose of this project is to engage the EM&V community on market research/characterization of market share, price trends, and consumer response to products. Research will use existing information and collect new as appropriate. The project will provide results that can be used in support of rulemaking processes as well as informing P.A.s' program design and marketing. The standards schedules will inform the focus of the work that is needed: expected to include water heaters - research on impacts on HVAC energy, consumer satisfaction with HPWH, in-field energy use in colder climates (DOE proposal is due April 2016)	CT can have its own appliance standards, so it is important to understand where PAs can best influence/direct new standards (prospective look at how CT can play a supporting role for savings from codes).
92	NEEP Baseline Costs - CT Contribution	NEEP is a successful, regional / cooperative association that provides research and support for broad regional priorities / collaboration in a way that leverages funding toward CT and regional goals. This project represents CT's baseline support contribution aside from individual project support.	NEEP is a successful, regional / cooperative association that provides research and support for broad regional priorities / collaboration in a way that leverages funding toward CT and regional goals.
COMMERCIAL IMPACT AND/OR PROCESS EVALUATIONS & ELEMENTS			
101	ECB Process & Impact Evaluation (incl. info for program marketing, NEI)	This research would consist of two components: a process evaluation and an impact evaluation. The process evaluation would focus on identifying the goals of the program (both long term and short term), assessing the effectiveness of the program towards achieving those goals, and providing recommendations for how the program can improve. The process evaluation will also include survey inquiries for several potential non-energy impact areas, benefits and costs. The impact evaluation would estimate the adjusted gross energy savings (both gas, electric, and demand) and net energy savings and demand. The final component will be provided an assessment of the C&I new construction elements of the PSD and providing recommendations for these that work well with all of the utility programs (i.e., takes into account the different program databases at a detail level.) The research would primarily consist on engineering on-site M&V, desk review, and interviews with program participants and trade allies. In addition, as available, the evaluation team would contact rejecters (i.e., customers that contacted the program or were contacted by the program but did not participate. Identification of those that didn't complete their buildings (from secondary data and/or phone calls will be differentiated from those that built the buildings but did participant. Surveys will be conducted with rejecters that built their buildings to better	A significant portion of the EEB program portfolio savings is attributed to the ECB program (41.1 million kWh in 2012). This research would update the evaluation conducted of the 2009 program and serve two high level objectives. First, the impact evaluation would verify the savings claimed by the ECB program, reducing program uncertainty and planning risk. Second, the process evaluation would highlight components of the program that are working well and provide recommendations for realistic improvements in program delivery.

Sheet #	Project Name	Short Summary of Project	Why Priority
		understand barriers to participation versus barriers to efficiency adoption.	
100	SBEA Process Evaluation (incl. info for program marketing, NEI)	A process evaluation for the SBEA program is due, was approved in the 2013 evaluation budget and will be beginning this fall. The start in the last quarter of 2013 means that much of the evaluation will be conducted and completed in 2014. Funding in 2014 is then required to ensure meeting the needs for contracts and funding for completion of the process evaluation.	As the SBEA study continues to have aggressive energy savings goals, it becomes increasingly important to ensure the program functions efficiently as it scales up its internal systems to handle greater program throughput. The process evaluation will also include survey inquiry into non-energy impacts, benefits and costs.
53	ECB - Strategy for advanced commercial building & renovation design	Compare with other leading initiatives (NZEB, LEED, Architecture 2030, DOE Better Buildings, etc.). Review success in implementation. Interview designers to assess satisfaction. Identify strategies with the most promise for replication and deep savings. Develop market transformation plan to help these become common practices in appropriate buildings, including, as needed, incentives, design assistance, case studies, and developer or supply chain incentives and/or financing. Use ECB process evaluation information to inform comparative and help prepare appropriate recommendations.	Despite the advanced nature of Connecticut's commercial building energy codes, even more efficiency is available for new and renovated building design but it's achievement will be challenging. This study will draw together the lessons learned from best practice programs and recent design experience to point to the design and project management strategies that are most replicable, and suggest tools and processes to encourage replication.
57	Process Evaluation & Market Research of the Integration of Financing and C&I Efficiency Programs	This study will be a process evaluation regarding the level of coordination/integration of current and emerging financial offerings and current energy efficiency programs. Interviews to assess customer and contractor experience with combined programs. Review efficiency of combined transaction from administrative perspective and in terms of customer labor and expertise requirements to complete transaction with confidence. Surveys or in-depth interviews with customers of major non-residential property owners and manufacturers (properly segmented by size, sector and owner/decision-making process) to better understand customer interest, opportunities and barriers to project financing and current financing offerings (e.g., CEEF C&I loan programs, SBEA financing, CEFIA-CPACE, DEEP-LBE ESPC initiatives, etc.)	In response to State energy efficiency policy, Connecticut is relying heavily on financing initiatives to accelerate efficiency program penetration while highly leveraging ratepayer-based program funds. Although technical service/incentive programs are a well-established and critical element of success in energy efficiency, overall success for Fund leveraging depends on: a) a clear understanding of the financing needs, interests and barriers of each non-residential market segment and b) the integration of the State's efficiency and financing programs into a seamless set of services that work to make customer investment as simple, painless, compelling and financially rewarding as possible.

Sheet #	Project Name	Short Summary of Project	Why Priority
41	EO process and impact Phase 1 (2015) & Phase 2 (2016); (incl. info for program marketing & NEI)	This research would consist of two components: a process component and an impact component and act as a follow-up to the current EO study, the next study in EO's two-year evaluation cycle. The process component would focus on identifying the goals of the program (both long term and short term), assessing the effectiveness of the program towards achieving those goals, and providing recommendations for how the program can improve. The surveys for the process evaluation will also gather data on non-energy impacts, benefits and costs, due to the program. The impact portion would estimate the adjusted gross energy savings (both gas, electric, and demand). The research would primarily consist on engineering on-site M&V desk review, and interviews with program participants and trade allies. In addition, as available, the evaluation team would contact program drop-outs (customers recruited into the program but dropping participation at some time prior to completion) to better understand barriers to participation.	The EO program is the largest contributor, over one-third, to the EEB program portfolio savings with 109.2 million kWh in 2012. This program has been on a 2-year cycle for process and impact evaluations. This research starting in 2015 would update the evaluation currently being completed evaluating the 2011 program. The evaluation would serve two high level objectives. First, the impact evaluation would verify the savings claimed by the EO program, reducing program uncertainty and planning risk. Second, the process evaluation would highlight components of the program that are working well and provide recommendations for realistic improvements in program delivery.
36	Large Projects Evaluation	A 2009 IEPEC paper ("Large Lessons Learned") details a census approach to the very largest projects. An intensive and precise approach to these projects may be able to provide better savings estimates at lower cost. Comparing with the other program evaluations could provide insight into whether these customers systematically differ from smaller customers.	A census of the largest projects may provide better savings estimates at lower cost. The C&I programs with significant savings are on a 2 or 3 year evaluation cycle. Conducting impact evaluation on the largest projects each year from 2015 onward (based upon useful results from this pilot) could cost-efficiently supplement this cycle with significant lowering in the uncertainty of the savings estimates.
102	SBEA Impact Evaluation	Comprehensive impact evaluation for the SBEA program (suggested for 2015 evaluations).	The SBEA impact evaluation has been on a 2-year cycle and will be due for another impact evaluation in 2015. The currently completing impact evaluation was on electric measures only (almost all is lighting). This SBEA impact evaluation will make savings estimates more current and fill the gap for non-electric measures.
106	Early process evaluation of new/major program changes for Strategic Energy Management	An early process evaluation (early 2015) on the new program being designed/re-designed for SEM. The evaluation needs to look at whether the changes might be successful and feedback that provides indicators of success, ideas of ramp-up or not, if improvements are needed early or whether something very different needs to be attempted.	The major changes being worked on for the series of programs within BES/O&M: O&M Services, RetroCx, PRIME, BSC are being done as one of the primary ways to move the CT effort towards deeper savings and recent CT goals. Many parties will be watching for whether the changes might be successful and feedback that provides indicators of success, ideas of ramp-up or not, if improvements are needed early or whether something very

Sheet #	Project Name	Short Summary of Project	Why Priority
			different needs to be attempted. Given the high interest level, this evaluation along with feedback from the PAs and other consultants, will likely be desired.
60	Loadshape Research - Catalog / Secondary Research (NEEP)	Secondary research to identify loadshapes that are as regionally-appropriate as possible. Loadshape Data Inventory / Catalog (NEEP): The purpose of this project is to make existing northeastern loadshape data available to program administrators for use in regulatory purposes, planning and analyses on an ongoing basis. The deliverable is spreadsheet tables of loadshape-related impact parameters (including coincidence factors, seasonal on & off peak % savings) based on an inventory of all available data. Links to the source data will also be provided (subject to appropriate permissions), allowing users to perform a customized analysis of the source data, in whatever format they were created. This project will not reformat or standardize or create a new database, as the goal is to get data into the hands of program administrators for timely sharing in an ongoing way, to support forward capacity and other evaluation needs in the region. In 2014 this project will begin with a survey of Forum members to identify load shape data studies as well as data requirements and priorities (peak coincidence factors, equivalent full load hours, etc.). Existing loadshape data will be reviewed for applicability and the source files will be procured by the contractor for analysis and direct access by other potential users of the data. An analysis of the source data will be conducted to produce the required parameters. This catalog will also help identify measures for which new primary loadshape research (including 8760 studies) is appropriate. This catalog/project could be developed at a sub regional scale or for the Forum region as a whole.	Loadshapes are expensive to obtain, but important to estimating impacts and potential. A "Shareable" database / inventory would be a valued resource.
103	C&I Measure Life - update PSD & assess need for other C&I Measure Life studies (Possible NEEP)	NEEP is currently looking at updating measure life in 2014 from regional studies and secondary sources. Then this study would update PSD and assess what other C&I measure life needs to be studied & updated. This study's assessment will look at the reference (for those not updated with NEEP work) age, applicability, % svgs obtained from that measure and the likelihood of being able to decrease uncertainty with a new CT study.	ISO-NE protocols discourage use of studies more than five years old, and many of our existing sources date from 2005-2007. Additionally, measure lives have a dramatic impact on lifetime savings and cost-effectiveness, and have not been systematically reviewed in Connecticut in some time.
COMMERCIAL MARKET AND MEASURE EFFECTS / PERFORMANCE			

Sheet #	Project Name	Short Summary of Project	Why Priority
10	New Construction Baseline & Code Compliance	A study can be performed to gather data on baseline construction practices and test to see if they are lined up with the newly implemented 2012 building codes upon which PSD savings estimates are based. This effort would likely be on-site based and be comprehensive enough to assess the baseline assumptions contained in the PSD for most lost opportunity measures.	Industry experts have cited that the greatest source of uncertainty in our impact evaluations may be what we use for baseline. Differences between code and actual baseline practices can affect savings estimates as well as program cost effectiveness.
83	C&I Financing Market Research	C&I market research is beginning in 2013 in two projects. This "project" is continuing of funding to address the market research being completed in 2014 and the need for funds in 2014 to meet contracting and payment needs. The program administrators and C&I Committee have provided business/industry types that they would like used for segmentation and/or for sample and analysis design. This is within the design of the two C&I market research beginning in 2013 that will be carried forward in 2014.	There is a significant lack of current CT information in this area. Greater uptake of the financing tools offered and participation in the CT programs is desired in order to meet CT energy efficiency goals. The role of financing versus other barriers are important to ascertain needs program improvements and enable accurate knowledge of the C&I market with regard to financing requirements for the best program planning and realistic expectations.
52	Assess Lighting Structure for Capability Regarding High Performance Lighting	To achieve deeper savings in a changing lighting market, following several years of lighting retrofits, may include the need to move to high performance lighting. The skills and market operation for high performance lighting is different for most prior types of lighting retrofits. This market research will seek to answer the question of whether the lighting market in CT in set up and ready to be able to achieve deep savings through high performance lighting. Interviews with contractors to assess current business models, interest in engaging in deeper design-based retrofit as a new business line, training and certification levels, and their view of the customer market. Interviews with customers who are motivated to invest in lighting efficiency to assess their ability to consider deeper investments, possible roles of financing, ability to manage more complex projects, and the type of incentives and services that could lead to success. Summary analysis will recommend program design elements to transform at least the leading edge of the lighting retrofit market (customers and vendors) to more comprehensive practices.	Comprehensive retrofit of commercial buildings is a major tool to meet Connecticut's Energy Efficiency goals. However, it requires understanding how the customers and contractors can work together to achieve the major components, with lighting being the largest. This in turn requires an understanding of the existing capabilities and business models of the contractors who deliver lighting services, and the investment framework, resource, needs, and drivers of customers.
107	Market Research on EE Investments Over Time versus Deep Savings at Once	This market research study probably will need to be conducted in phases and with great attention to other work involving C&I decision-making, financing and programs and other relevant research. First step could be to ascertain whether over-time information for CT program participants is conducive for evaluating cumulative effects and timeline of these effects. Then design MR given other studies recently conducted or on-going (such as financing & decision-making, integrating programs & financing tools, etc.).	CT policy is asking for much greater savings and there is much discussion about "deep" savings. Little is known from research (versus anecdotal) about decision-making over time or decision-making for investments over time. "Deep" savings cannot be targeted cost-effectively without this knowledge.

Sheet #	Project Name	Short Summary of Project	Why Priority
98	Studies To Be Identified - including Market Research and Outer Year	This is a place holder to cover market research or evaluation studies that need to be added as things change in the programs or in the CT market.	To be determined
COMMERCIAL EVALUATION METHODS AND PSD SUPPORTING INFORMATION			
104	Detailed review of C&I PSD existing buildings, FR&SO, loadshapes and its use	PSD is the interface between evaluation work and program planning and savings reporting. To ensure comfort in the unbiased application of evaluation results requires a PSD that can be straightforward for the utilities to use. The updates need to be workable by utility and so need to be able accommodate differences in program databases. Update PSD for C&I FR, SO and loadshapes given work performed by CT and NEEP over last few years. Examine other C&I existing bldg PSD for which is cost-effective for additional evaluation work. Recent work in C&I FR and SO and by NEEP provide information that needs to be reviewed as to how the PSD was updated and what further updates or greater clarification/specification in their use is needed. Then an assessment needs to occur to direct future evaluation efforts to improve the PSD, i.e., remaining gaps, areas with old work or elements of the PSD that should differentiate between use for large C&I versus small C&I.	PSD is the interface between evaluation work and program planning and savings reporting. To ensure comfort in the unbiased application of evaluation results requires a PSD that can be straightforward for the utilities to use. The updates need to be workable by utility and so need to be able accommodate differences in program databases. Update PSD for C&I FR, SO and loadshapes given work performed by CT and NEEP over last few years. Examine other C&I existing bldg PSD for which is cost-effective for additional evaluation work. Recent work in C&I FR and SO and by NEEP provide information that needs to be reviewed as to how the PSD was updated and what further updates or greater clarification/specification in their use is needed. Then an assessment needs to occur to direct future evaluation efforts to improve the PSD, i.e., remaining gaps, areas with old work or elements of the PSD that should differentiate between use for large C&I versus small C&I.

Sheet #	Project Name	Short Summary of Project	Why Priority
63	Incremental Cost Estimation Study (NEEP); Half included under Residential, and Half under Commercial.	Incremental Cost Estimation (NEEP): NEEP description. As with previous Forum Incremental Cost studies, the purpose is to develop incremental cost estimates and cost curves (costs at varying efficiency levels) for measures and/or program types (gas and/or electric) beyond those previously studied. The deliverable will be cost curves and worksheets and a summary report. The 2013 project budget will not cover all of the measures that are under consideration for study. It is appropriate to continue this project to study incremental costs of common prescriptive measures, and of new/emerging measures, and to update costs periodically as markets change. Unlike some other aspects of efficiency measures, data on costs of baseline and efficient measures can be difficult to obtain and are likely to be similar within sub-regional markets rather than obeying state boundaries. Development of cost curves rather than measure by measure estimates is more economical and flexible. The Forum is well-suited to apply a consistent analytical method across jurisdictions.	Incremental costs are important -- and very useful to be able to have more regionally-appropriate sources than DEER, etc.
105	Evaluability assessment of new/major program changes for Strategic Energy Management	Major changes are being worked on for the series of programs within BES/O&M: O&M Services, RetroCx, PRIME, BSC and this project will provide an evaluability assessment to provide recommendations early-on so the new program(s) can conduct evaluations that provide reliable savings estimates.	Major changes are being worked on for the series of programs within BES/O&M: O&M Services, RetroCx, PRIME, BSC and this project will provide evaluability services to those working on program design. Savings cannot be reliably claimed if the program databases or procedures are not well designed to be able to reliably evaluate the program(s).

Attachment B: Input Information Provided on NEEP Project Budgets

A combination of the information available from NEEP on project budgets for (some) 2014 projects (provided below), combined with the professional judgment of the Evaluation Consultant Team and information from participation in NEEP conference call discussions was used to derive the cost estimates and potential timing for the NEEP projects for 2014-2016 embedded in the recommendations.

STATE	NY (prelim	MD	MA	CT	ME	DE	NH	DC (prelim	RI	VT	USDOE/EPA	Foundation	TOTAL	% SHARE
State Base Cost % alloc (7% min)	27.6%	12.4%	11.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%			100%	
Forum Operations / Facilitation, Planning & Admin	$49,835	$22,389	$19,862	$12,639	$12,639	$12,639	$12,639	$12,639	$12,639	$12,639		$30,000	$210,560	28%
Project Mgmt (NEEP, Tech Advisors)	$99,625	$44,759	$39,706	$25,267	$25,267	$25,267	$25,267	$25,267	$25,267	$25,267			$360,960	48%
EM&V Educ & Info Access	$30,492	$13,700	$12,153	$7,734	$7,734	$7,734	$7,734	$7,734	$7,734	$7,734		$70,000	$180,480	24%
TOTAL BASE COSTS	$179,952	$80,848	$71,720	$45,640	$45,640	$45,640	$45,640	$45,640	$45,640	$45,640		$100,000	$752,000	100%
State Project Cost % Alloc	35.0%	19.4%	17.5%	9.7%	3.4%	3.9%	3.4%	3.5%	2.6%	1.6%			100%	
Mid Atlantic TRM (sub-region)		$54,174				$10,964		$9,862					$75,000	4.4%
On-line Regional TRM Feasibility Study (may change to whole)	$52,516	$29,054		$14,521					$3,909				$100,000	5.9%
REED	$26,250	$14,522	$13,114	$7,258	$2,546	$2,939	$2,573	$2,644	$1,954	$1,200	$100,000		$175,000	10.3%
EE Job Impacts Methods or Analysis	$8,750	$4,841	$4,371	$2,419	$849	$980	$858	$881	$651	$400	$25,000	$100,000	$150,000	8.8%
National EM&V Methods	$17,500	$9,682	$8,742	$4,839	$1,697	$1,960	$1,715	$1,762	$1,303	$800			$50,000	2.9%
ISO FCM EE M&V support (sub-region)			$11,445	$6,335	$2,222		$2,245		$1,705	$1,047			$24,999	1.5%
Ductless HP Meta Study	$34,042		$17,006	$9,413	$3,301	$3,812	$1,112		$2,534	$1,556			$72,776	4.3%
Geo-targeting EE/DR Research and EM&V			$66,387	$36,745	$12,887	$14,880	$13,025			$6,076			$150,000	8.8%
Engineering & Billing Analysis Methods	$26,250	$14,523	$13,114	$7,258	$2,546	$2,939	$2,573	$2,644	$1,954	$1,200			$75,001	4.4%
Loadshape Catalog	$105,000	$58,091	$52,454	$29,033	$10,192	$11,757	$10,291	$10,575	$7,815	$4,800			$300,008	17.7%
Measure Life Research	$87,500	$48,409	$43,712	$24,194	$8,485	$9,798	$8,576	$8,312	$6,513	$4,000			$249,499	14.7%
Incremental Costs		$58,249	$52,596	$29,112		$11,789		$10,604	$7,837	$4,813			$175,000	10.3%
Lighting Interactive Effects			$48,467	$26,826	$9,408	$10,864				$4,435			$100,000	5.9%
TOTAL PROJECT COSTS	$357,808	$291,545	$331,408	$197,953	$54,133	$82,682	$42,968	$47,284	$36,175	$30,327	$125,000	$100,000	$1,697,283	100.0%
TOTAL 2014 DRAFT FORUM COSTS	$537,760	$372,393	$403,128	$243,593	$99,773	$128,322	$88,608	$92,924	$81,815	$75,967	$125,000	$200,000	$2,449,283	
Percent of Total Forum Costs	22.0%	15.2%	16.5%	9.9%	4.1%	5.2%	3.6%	3.8%	3.3%	3.1%	5.1%	8.2%	100.0%	