

# MA EEAC



## CONSULTANT TEAM

### Memorandum

To The Energy Efficiency Advisory Council  
Massachusetts Program Administrators  
From The EEAC Consultant Team  
Date April 25, 2014  
Subject DRAFT Recommended "Deeper Dive" Topics and Data Requests

The Consultant Team is pleased to provide this memorandum to the Council and the Program Administrators regarding recommended priority topics for the "Deeper Dives" to follow the 2014 PA Implementation Update. As articulated in the Implementation Update briefing provided at the November 2013 EEAC Meeting, the three to five "deeper dives" are to be focused on the most significant drivers of changes from the original plan values (goals) and informed and completed using more detailed data than has been available in the past. In this memo we describe the rationale behind each request for additional data and the specific data needed in each case.

## Topic 1: Understanding Differences in C&I Large Retrofit Achievement

The 2014 Implementation Updates (2014 IU) show that while PAs continued to achieve high levels of savings in 2013, they underachieved against the annual targets set forth in the Three Year Plan. There is significant concern that the overall Three Year goals will not be achieved if annual targets are not achieved. The C&I Retrofit Initiative continues to drive most of the statewide underachievement. Statewide savings fell short of the 2013 C&I Large Retrofit savings targets, at just 69% and 81% of goal for electric and gas savings, respectively. The 2014 IU proposes achievement significantly below the Three Year Plan goals for this initiative, as shown in the table below.

### Proposed Statewide IU Achievement for Large C&I Retrofit

| Year                | Electric | Gas |
|---------------------|----------|-----|
| 2014                | 83%      | 86% |
| 2015                | 96%      | 86% |
| Three-Year IU Total | 83%      | 85% |

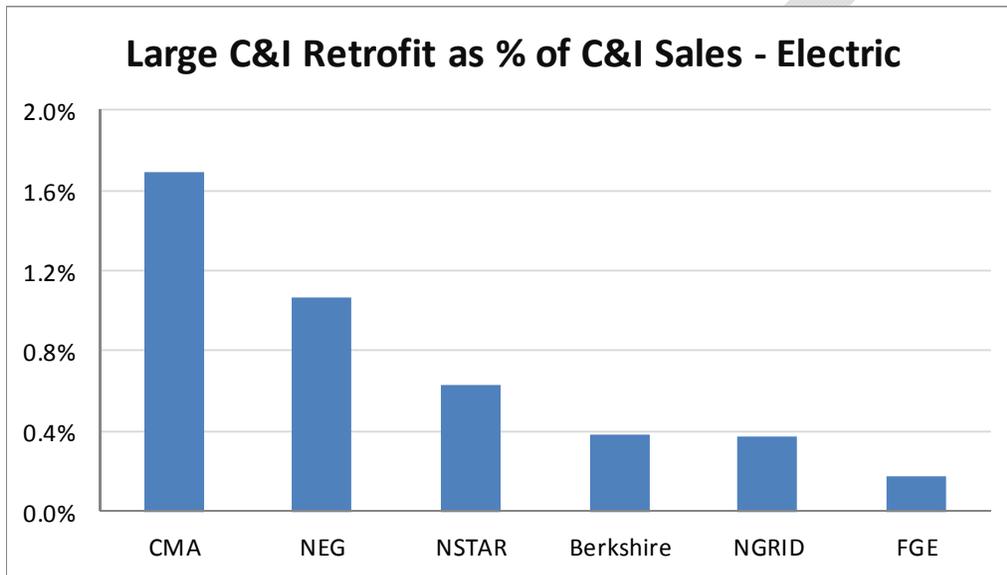
There continues to be wide variability in achievement between PAs in the C&I Retrofit Initiative. While some of the deviations in performance may be explained by service territory differences, differences in strategies and tactics used by the PAs may be a significant factor in performance. Understanding the differences in both customer composition

and service delivery are essential to identifying best practices, supporting the improvement of statewide performance, and addressing deviations that are driven by customer composition.

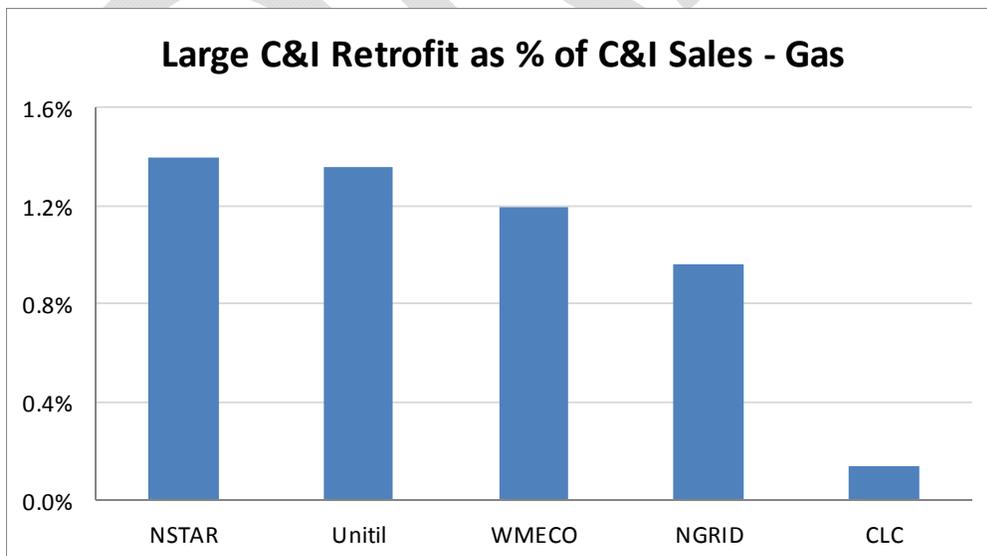
When PA C&I large retrofit results are normalized against total electricity and gas sales (a good proxy for energy efficiency opportunity), the differences in achievement are significant and pronounced as shown in

and Error! Reference source not found. Some PAs are achieving almost 10 times the savings as percent of sales as compared to their counterparts.

Large Retrofit 2013 Electric Savings as Percent of Sales by PA



Large Retrofit 2013 Gas Savings as Percent of Sales by PA



Another area of inquiry for this topic is the ability of the PAs to achieve the C&I Large Retrofit savings proposed in the 2014 IU. Accomplishing even the reduced savings levels shown in the IU will require significant increases in large

retrofit savings achievement over the next 20 months. National Grid proposes to increase large retrofit savings by 26% from 2013 to 2014 and by another 59% between 2014 and 2015. Overall, National Grid proposes to double their large C&I Retrofit savings between 2013 and 2015. NStar was closer to their goal last year, so their proposed 30% increase from 2013 to 2014 brings them nearly to the level of the 2014 and 2015 goals, requiring no increase from 2014 to 2015 and only minor changes in the IU.

**Large C&I Retrofit Actual and IU Savings, as % of Three-Year Plan Goal and Increase from Previous Year**

| Utility | 2013 (Actual) |            | 2014 (IU) |            | 2015 (IU) |            |
|---------|---------------|------------|-----------|------------|-----------|------------|
|         | % of Goal     | % increase | % of Goal | % increase | % of Goal | % increase |
| NGrid   | 53%           | 16%        | 64%       | 27%        | 95%       | 59%        |
| NSTAR   | 81%           | -7%        | 99%       | 30%        | 99%       | -1%        |

Because of the significance of Large Retrofit to the Three Year Plan Goal, even at reduced performance levels, it is important to understand whether the rate of change in project development, depth of savings and completions over the coming months are adequate to support the proposed increases in savings levels. In addition, it is essential to contrast the changes being made across PAs to ensure that the best practices are proliferating across the state.

As documented in the *Annual Implementation Update – Narrative Description Document*, we request that the PAs each provide a narrative that addresses the following:

- Reasons for short falls in this sector in 2013
- Clear descriptions of the proposed changes that are expected to drive PA results to achievement levels laid out in the IU. Descriptions should including timeframe for implementation, interim metrics to monitor and report progress toward meeting the IU achievement levels, PA expectations regarding expected savings from changes.
- Description of sales and incentive structure including staffing levels, skills, incentive structures, goals, performance monitoring and feedback mechanisms, including 1) an identification of advantages and potential limitations of existing structure, and 2) planned modifications, if any, and their expected result

In addition to the narratives, we request the following data to support a deeper understanding of the challenges faced in achieving the large retrofit goals, the solutions being implemented and the incremental progress toward meeting the proposed savings levels.

| Research Questions  | Data Needed   | Proposed Use   |
|---|---|--|
| <b><u>Understand the Large C&amp;I Existing Buildings Customer Base</u></b> |   |  |
| What are the key characteristics of the medium and large customer           | <b>New Data Requested</b><br>Customer count and average size by quartile <sup>1</sup> . | These data will enable better understanding of the different opportunities within each PA territory to |

<sup>1</sup> Quartile data is requested down to the level at which a customer would be enrolled in the DI program. For electric PAs this is generally customers with demand below 300kW. This request is not looking for data on small customers.

base for each PA?

Customer type and count by quartile.

achieve the target savings levels which inform the potential for different approaches necessary to achieve goals. For instance, fewer, larger customers in the top quartile would mean larger projects may be executed having a significant impact on total savings. A greater number of smaller customers in the top quartile would likely necessitate implementation of a larger number of projects to achieve a similar goal.

Approximate upper bound of the top quartile

Cross tab of customer type and count by quartile and electric/gas utility.

**Data from Other Sources**

PA specific data from Chapter 7 of the 2012 C&I Customer Profile report.

2013 Data from same when available.

**Understand Characteristics of Program Participants and Projects**

What types of customers are actively participating?

**New Data Requested**

Analysis of trends and patterns around types of projects, successful projects within a certain sector shows the potential for achievement within a sector. This information can be cross referenced against the customer base data to identify opportunities and constraints within PA territories.

What types of projects are contributing to savings?

Savings, costs and customers by market segment and quartile for 2013.

2013 project characteristics: number of projects by savings size (range) in each customer quartile cross tabbed by customer type, measure type and cost to achieve

**Data from Other Sources**

Savings and customers by market segment and quartile 2012 (DNV GL Database)

Quarterly reports

Data described in the depth of savings memo

**Understand the Pipeline**

How are PAs filling their pipelines, including project development, commitment and implementation?

**New Data Requested**

Large retrofit projects take time to develop. In order to have confidence that the MA PAs are on track to achieving the increases in project development and closure at the levels proposed in the IU, it is essential to understand the project pipeline, close rate and completion rate for each PA. Absent this information, the EEAC will likely go into Q4 of 2015 looking at huge gap in C&I Large Retrofit Savings

Is the fill rate of the pipeline accelerating at the levels needed to attain the proposed levels of achievement for the Three

2014 and 2015 committed projects by quartile, sector, measure types, estimated savings, estimated completion date and probability monthly. Identify new vs existing in pipeline month to month. Indicate completions retired from pipeline.

2014 and 2015 enrolled but not

|            |                                 |   |
|------------|---------------------------------|---|
| Year Plan? | committed – same data as above. | without the direct knowledge of whether the expected goals are in reach. With these data the Consulting Team can track progress, address any concerns with PAs and provide updates to the EEAC. |
|            | <b>Data from Other Sources</b>  |   |
|            | None                            |   |

## Topic 2: Lighting in the Residential and Low Income Sectors

Lighting has been and will continue to be the single largest source of PAs’ electric savings for both the Residential and Low Income sectors. In the Residential sector these savings come not just from the Lighting Initiative, but also from direct install (DI) practices and program requirements for the Residential New Construction (RNC), Home Energy Services (HES), and Multifamily Retrofit (MF) Initiatives. To provide a sense of the magnitude of this contribution, the table below shows the contribution of lighting and lighting initiatives to Residential and Low Income sector based on 2013 planned electric savings targets. Lighting clearly plays a critical role in both sectors, with lighting savings coming from both the Residential Lighting Initiative and other non-lighting initiatives. Lighting represents an even larger fraction of savings from installed measures (i.e., when excluding behavioral savings.,

|   |     |
|---|-----|
| Residential Lighting Initiative as percent of total residential savings | 47% |
| excluding behavioral savings  | 69% |
| All lighting as percent of total residential savings                    | 59% |
| excluding behavioral savings  | 86% |
| DI lighting as percent of HES, MF, & RNC initiatives                    | 71% |
| Lighting as percent of total low income savings                         | 63% |

The proposed Implementation Update deeper dive for residential and low income lighting will address the rapidly changing landscape for this end use and seeks to assess whether the PAs’ forecasted increased savings for lighting in 2014 (e.g., 133% of res lighting initiative goal) and 2015 (e.g., 132% of res lighting initiative goal) will be attainable and at what cost. The Consultant Team would like to understand whether the PAs’ three-year planning assumptions for lighting accurately reflect the dramatic changes in the residential lighting market and the progress the PAs have made in promoting LEDs.

The PAs’ Three-Year 2013-2015 Plan (“the Plan”) for the residential Lighting Initiative was largely informed by market conditions in mid-2012. The Plan assumes that in 2015 only 5 percent of residential Lighting Initiative products will be LEDs and that the average costs for LED A-lamps and reflector lamps will be \$35 and \$50, respectively. Incentive planning assumptions in 2015 are \$12 for an A-lamp and \$20 for a reflector. The market for LEDs has progressed much more quickly than was anticipated in the Plan. In 2013, 14 percent of all units sold through the Lighting Initiative were LEDs, and there are an increasing number of high quality ENERGY STAR-certified LED lamps available at retail for under \$15, including some for under \$10. Examining these planning assumptions will support better estimates for the costs and benefits of lighting, particularly lifetime savings and program budgets due to higher proportions of LEDs. In addition, the consultants are interested in understanding 1) what effect increasing direct installation of LEDs in the LI, HES, MF, and RNC Initiatives would have on the PAs’ savings, benefits, and budgets

forecasts and 2) whether variances among PAs in achieving lighting savings expose any best practices that could be implemented to achieve greater savings.

As documented in the *Annual Implementation Update – Narrative Description Document*, we request that the PAs each provide a narrative that addresses the following:

- The primary reasons for residential and low income lighting results in 2013, including all initiatives to which lighting contributed to savings, benefits and budgets goals
- Detailed descriptions of proposed changes that are expected to drive PA results to achievement levels laid out in the IU, including timeframe for implementation and interim metrics that they will be using to monitor and report progress toward meeting the IU achievement levels

The table below provides the specific details of the questions to be addressed for this deeper dive, data requested from the PAs, and the proposed use of the data. We are eager to work with the PAs to refine the scope of this effort and resulting work products. A report on this lighting deeper dive will be presented to the Council at its August 12 meeting.

| Research Questions   | Data Needed  | Proposed Use  |
|--|--|---|
|  | <b><u>Assessing Planning Assumptions</u></b>   |   |
| Do EISA standards, the accelerated evolution of LED lamp technology, growing consumer interest in LEDs, increased LED availability, and declining LED prices support a revision of the PAs' planning assumptions (e.g., gross savings, measure lifetimes) in the Plan? | <b>New Data Requested</b>  | Assess how proposed changes in lighting retail and DI activity will increase or decrease the PAs' reliance on lighting as the principal source of savings for the Residential and Low Income sectors by 1) addressing and updating LED and CFL program market shares, product costs, and incentive levels; and 2) calculating cost efficiency metrics - \$/annual and lifetime kWh - to allow comparisons of different lighting scenarios reflecting varying LED and CFL product mixes, pricing, and incentive levels |
|  | PA-level unit goals by lighting product category for 2013-2015<br><br>Average incentive level paid by lighting product category in 2013 in the PAs' retail Lighting Initiative.<br><br>Average planned incentive level to be paid in 2014 and 2015 by lighting product category in the PAs' retail Lighting Initiative.<br><br>2013 distribution of hard-to-reach (HTR) CFL sales by retailer.<br><br>Current version of PAs' lighting Market Adoption Model |   |
|  | <b>Data from Other Sources</b>   |   |
|  | Monthly Lockheed Martin reports  |   |
|  | Regional hours of use study  |   |
|  | Measure lifetime worksheet   |   |

**LED Opportunities in Direct Install Initiatives**

What effect would increasing direct installation of LEDs in the LI, HES, MF, and RNC Initiatives have on the PAs' savings, benefits, and budgets forecasts?

**New Data Requested**

Average number of CFLs and LEDs installed per home in 2013 in the PAs' RNC, HES, MF and LI Initiatives.

Average number of CFLs and LEDs planned to be installed per home in 2014 and 2015 in the PAs' RNC, HES, MF and LI Initiatives.

Average installed cost of CFLs and LEDs in the PAs' 2013 RNC, HES, MF and LI Initiatives, with material and labor costs noted separately.

Average planned installed cost of CFLs and LEDs in the PAs' 2014 and 2015 RNC, HES, MF and LI Initiatives, with material and labor costs noted separately.

**Data from Other Sources**

None

Assess opportunities to increase direct installation of LEDs in RNC, HES, MF and LI Initiatives

**Understanding Variations in PA Achievements**

Do variances among PAs in achieving lighting savings expose any best practices that could be implemented to achieve greater savings?

**New Data Requested**

Number of units rebated per household

Units rebated by major lamp category

Incentive levels

**Data from Other Sources**

Implementation Update tables

Three-year plan documents

Assess variations and identify opportunities for greater savings

## Topic 3: Multifamily Retrofit Initiative

Providing energy efficiency services to multifamily buildings (5+ units) is a complex effort, involving a wide range of customers in the residential, low income, and commercial sectors and a variety of building types and systems. This topic was suggested by the PAs as a candidate for an Implementation Update deeper dive because the 2013 electric benefits preliminary results statewide for the residential multifamily retrofit were just 53 percent of goal. The Council expressed interest in developing a greater understanding of multifamily issues. This effort will cover both electric and gas multifamily programs in order to provide a comprehensive picture. This will address both the Implementation Update deeper dive and the previous “scheduled topic” on multifamily, initially scheduled for the August 2014 Council meeting.

The residential multifamily retrofit initiative will be the primary focus of this deeper dive. This program initiative has been restructured in recent years and the PAs have increasingly been focusing on increasing integration between gas and electric and between the residential and commercial sectors. In 2013, preliminary year-end results indicate that the residential multifamily retrofit initiative accounted for approximately 5 percent of the PAs’ total savings for both electric and gas. The statewide goals for the initiative were achieved except for electric benefits and gas program spending. At the individual PA level, there were some very strong results, but also a number of instances in which goals were not met.

In addition to examination of the multifamily benefits short fall, this deeper dive will include a high-level examination of several opportunities to build on PA successes in moving toward a more seamless customer experience and achieving deeper energy savings for residential and commercial multifamily customers. Toward that end, the proposed additional research encompasses four key components:

- Process review of the project implementation cycle to identify opportunities to enhance residential and C&I integration
- Technical review of measures currently being offered with emphasis on the potential impact of increased customization and the addition of oil heat measures
- Assessment of impact of inclusion of fuel oil on energy and non-energy benefits
- Identification of opportunities for using pre-screening and benchmarking to triage multifamily participants

This work is intended as a complement to the process evaluation for the multifamily retrofit initiative that is currently under way. The Consultant Team is mindful of both the opportunity to leverage the information collection efforts associated with that effort and that that its conclusions should not be anticipated at this stage.

As documented in the *Annual Implementation Update – Narrative Description Document*, we request that each PA provide a narrative explaining:

- the reason(s) that it did or did not achieve the 2013 electric benefits goal for the multifamily retrofit initiative, and
- how it plans to address any benefits short fall over the course of the Three-year plan.

The table below provides the specific details of the questions to be addressed for the additional research areas, data requested from the PAs, and the proposed use of the data. We are eager to work with the PAs to refine the scope of this effort and resulting work products. A report on this multifamily deeper dive will be presented to the Council at its

June 10 meeting. With this high-level analysis being conducted in a short time frame and with limited resources the consultants expect that additional research needs will be identified in the course of the work.

With respect to the requested sampling, The Consultant Team proposes to work collaboratively with the PA's to define a "representative sample" that can be obtained and analyzed in the time available for this research effort.

| Research Questions   | Data Needed   | Proposed Use   |
|--|---|--|
| <b><u>Residential and C&amp;I Integration</u></b>  |   |  |
| <p>What integration issues have been resolved as a result of the introduction of the MMI?</p> <p>What additional issues remain (with a focus on process) and what actions can be taken in the near term and in the next three-year plan to further the overall goals of streamlining the customer experience and ensuring that program resources are being used efficiently?</p> | <p><b>New Data Requested</b></p> <p>Short questionnaire completed by each PA, lead vendor, and MMI (developed in coordination with the evaluation team to avoid duplication of efforts)</p> <p><b>Data from Other Sources</b></p> <p>Results of surveys and focus groups obtained through the Multifamily Process Evaluation</p>  | <p>Using both new information and customer evaluation responses, develop:</p> <p>(1) a process flow chart that illustrates the various paths and decision points a customer might pass through while participating in the program, and</p> <p>(2) a map of key elements related to the delivery of multifamily services across PAs and between C&amp;I and Residential multifamily retrofit initiatives</p> <p>Identify opportunities for enhanced customer experience through improved integration of Residential and C&amp;I elements.</p>   |
| <b><u>Measure Assessment</u></b>   |   |  |
| <p>Are there opportunities to include additional energy efficiency measures that are cost-effective for the program and practical for the building owner?</p> <p>Could improving access to custom measures achieve greater savings and benefits?</p>   | <p><b>New Data Requested</b></p> <p>For both the residential multifamily retrofit and commercial multifamily initiatives:</p> <ul style="list-style-type: none"> <li>- Validation of eligible measure lists in Three-Year Plans (see below)</li> <li>- A listing of all custom measures installed in multifamily buildings from all PAs, including descriptions of the improvements completed within each custom measure</li> </ul> <p><b>Data from Other Sources</b></p> <p>Measure lists included in the Three-Year</p> | <p>Using the validated measure lists and additional details, conduct a technical review of the range of measures being offered in the multifamily initiative.</p> <ul style="list-style-type: none"> <li>- Based on industry best practices as driven by building science, available technologies, and applicability of those technologies to multifamily buildings.</li> <li>- Provides a gap analysis to identify possible new measures, a review of custom measures, and typical measure packages</li> <li>- Assesses the comprehensiveness of typical projects and the appropriateness of measures installed when comprehensiveness is not possible</li> </ul> |

Plan

**Delivered Fuels Opportunity**

How would the inclusion of delivered fuels in the multifamily energy reduction goals impact the initiative's results in terms of widening the customer base and increased capture of both energy and non-energy benefits?

How much can the benefits realized from measures targeting delivered fuels help improve the overall benefits captured for projects that would otherwise be limited to electricity reductions only?

**New Data Requested**

A representative sample of multifamily buildings/sites that have received electric savings measures only, including a detailed list of measures installed and the savings and benefits accrued to those measures

A representative sample of multifamily buildings/sites that have received both electric and natural gas measures, including a detailed list of measures installed and the savings and benefits accrued to those measures

**Data from Other Sources**

Any relevant findings from the recently completed Multifamily Market Characterization Study and data from external sources where available (EIA, RECS, CBECS, Buildings Performance Database, Portfolio Manager, etc.).

Description of the opportunity posed by the inclusion of fuel oil in the multifamily retrofit initiative, quantified in terms of potential benefits (to the extent possible given the limitations of the research effort) supported by development of a proxy measurement of the potential benefits associated with theoretical improvements to oil fueled buildings.

**Prescreening and Benchmarking**

Can pre-screening and benchmarking be used effectively to triage multifamily buildings into tiered service paths at the point of intake?

**New Data Requested**

None, assuming other tasks in this proposal are completed.

**Data from Other Sources**

Data and results of recently completed LI performance metric, to benchmark and inventory low income multifamily housing in the state will be used to inform this assessment along with results of the project process review described in the first task on this list.

Identify potential opportunities for utilizing pre-screening and benchmarking to appropriately assign program resources and set customers on the most direct path to maximizing their eligible savings opportunities

## Why Existing Data are Insufficient

The data needed to perform these analyses are not currently reported. **The Consultant Team requires detailed, comparable, and recent measure and project level data.** Although PAs do provide data to many parties, none of it supports this type of analysis:

- **Annual and Quarterly Reports:** The Annual and Quarterly Reports filed by the PAs contain only program, and in some cases initiative, level data. For example, C&I data are provided in just 3 'buckets:' C&I Retrofit, Small Business Direct Install, and New Construction. This provides no information as to the types of projects completed or on the measures installed.
- **BCR Screening Model Data:** The PAs's screening models are the data source for installed measures. DOER populates its PARIS database with this information from the PAS plans and annual reports. An examination of the data by the Consultant Team shows that each PA is providing different levels of measure detail. The data are not comparable across PAs; some PAs' data are not detailed enough. Some PAs provide measure quantities, while others provide only total savings. Furthermore, the data are not provided until the following year's Annual Report is filed, a minimum of 8 months after the results occurred. This significantly reduces the effectiveness of the PARIS data for the purpose of identifying best practices, especially as PAs continue to evolve and quickly change their strategies and tactics. However, for the 2013-2015 plans, DOER did develop common measure names for the residential and low-income sectors. These measures names should serve as a starting point for the MF deeper dive data request.
- **EM&V Study Data:** PAs provide detailed, comparable project and measure level data to evaluation contractors to support evaluation studies. However, these data are not provided until over a year after the projects are complete. For example, as of March 2014 evaluation contractors are currently collecting data from PAs on 2012 results, over a year since the projects occurred, greatly reducing the usefulness of the data. If data collection could be accelerated, the results would inform our current analyses and also be available for EM&V use later.

Last, we note that the statewide database envisioned by the Consulting Team and other stakeholders would support this type of analysis by providing detailed, comparable, and recent measure and project level data. It would also have other features that would enable further strategic analysis. However, the PAs have significant concerns with the database as proposed; the outcome of current discussions and planning for the statewide database is unknown. Absent the statewide database, and even in the interim while it is being developed and implemented, we must find other ways to obtain the data needed to perform analyses in support of the topics described above.