Fast Feedback Evaluation; a Combination of Riding Shotgun and Speed Dating

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ABSTRACT

Traditionally, third-party measurement and verification (M&V) evaluation results are provided at least six months after the close of the program fiscal year. This lag means that more than a year and a half of program implementation has passed before evaluation results are delivered and can be acted on. With program managers working diligently to meet energy savings targets, providing faster evaluation feedback allows implementers to adjust savings calculations to more accurately gauge progress towards those targets and further continuous improvement activities.

To provide quicker M&V feedback, the District of Columbia Sustainable Energy Utility's (DCSEU's) implementation and evaluation teams collaboratively piloted a fast feedback evaluation approach as part of the 2016 fiscal year evaluation activities. The Quality Assurance (QA) and On-Site M&V Coordination Pilot (Pilot) tested a protocol designed to coordinate and combine an independent third-party M&V process with the program administrator's QA and verification on-site visits. The Pilot took place between April 2016 and August 2016. Some of the benefits achieved include faster feedback to the implementation team for continuous improvement, improved access to customer sites, reduced customer fatigue, and a head start on conducting M&V activities, thereby significantly reducing the M&V activities that have to take place at year-end to meet the evaluation requirements. The challenges that were worked through and the lessons learned will help strengthen the fast feedback approach in the future. These results will help inform program teams interested in testing fast feedback evaluation.

Background and Introduction

The District of Columbia Sustainable Energy Utility (DCSEU) has been operating energy efficiency and renewable programs since 2010, and full-scale evaluation began the following year. The evaluation followed the traditional model of sampling projects after the completion of the program year and conducting evaluation activities on those projects, including on-site measurement and verification (M&V). In this paper, M&V refers to the independent third-party measurement and verification of installed measures or projects as part of a program evaluation process. This traditional approach however encountered several challenges, some of which are unique to the District of Columbia and others that are common to many evaluations. Evaluations throughout the industry faces customer fatigue from multiple contacts, and are time-constrained by regulators' and stakeholders' need for reported results shortly after the program year is over. The District of Columbia is somewhat unique compared to programs serving larger territories in that it has fewer available commercial and institutional customers, so not only are program participants contacted multiple times during a single year, but often participate in the program in multiple years and are more likely to be sampled for evaluation. Other city-level or municipal programs

might encounter similar issues; for example, Seattle has a similar population and a similar number of businesses, according to US Census data, though the types of businesses differ.

The DCSEU evaluation team borrowed practices from other states such as Texas and Pennsylvania to help mitigate these issues with a fast feedback pilot. Texas and Pennsylvania were states that the evaluation team was very familiar with and that had similar annual evaluation reporting requirements, and, in the case of Pennsylvania, had multiple parties trying to gather information, very similar to DCSEU. In Pennsylvania, the statewide evaluator conducts ride-along visits with the utilities' evaluators to ensure they see the same information and avoid an extra customer contact. In both Pennsylvania and Texas, the evaluation teams begin sampling and conducting M&V on-site visits on completed projects mid-year to avoid needing to conduct all of the on-site visits after the end of the program year. Coordinating the on-site M&V visits with the program's Quality Assurance (QA) staff, the District of Columbia attested a new approach.

The QA verification process usually involves a member of the implementation team (or their representative) inspecting the installation of a rebated measure to ensure that the equipment is rated appropriately, that the equipment is operational and to validate energy savings assumptions. The QA field staff look for discrepancies between project documentation and invoices, assess the site conditions including quantities, model numbers and equipment specification and identify inconsistencies on assumptions including site schedules, equipment run hours, and control strategies. The M&V verification process is conducted by the independent third-party evaluator's field staff who largely focus on the same information but with greater attention to the energy savings assumptions, methodology differences and corroborating data for key savings calculation inputs.

In 2016, the DCSEU program portfolio included sixteen unique program tracks that cut across program areas including renewable, residential, commercial, multifamily and retail products programs. Some of the programs specifically targeted income qualified recipients. The program tracks have been adjusted since the start of the DCSEU, however, no significant changes occurred over the last few years. Each year since 2013 (the first full year of the program), impact evaluation activities including M&V on-site visits have been conducted for most, if not all program tracks. Net-to-gross and process evaluation activities have been conducted on a rolling schedule.

The following sections describe the Pilot goals, the approach undertaken, the sample methodology and criteria used to select Pilot candidates and the Pilot results including examples of the high-level evaluation feedback and implementation follow-up actions. We discuss the benefits and review the challenges and key lessons learned. Finally, we highlight recommendations and considerations for future fast feedback evaluation efforts and draw conclusions.

Pilot Goals

In 2016, the DCSEU launched a Quality Assurance and On-Site M&V Coordination Pilot (Pilot) to test the viability and value of obtaining M&V evaluation results more quickly and to gain access to participant sites that had historically been difficult to schedule M&V visits. In early discussions, the Pilot's primary objective was to obtain better access to customer sites for the M&V review without the fast feedback component. Coordinating with the implementation QA team directly following the measure installation would help offset the difficulties that the M&V team was experiencing scheduling on-site visits months to a year and a half following the installation. DCSEU, however, saw value in receiving evaluation feedback sooner for program continuous improvement, so obtaining fast feedback findings was built into the approach.

The Pilot began in April and concluded in August 2016. The Pilot team consisted of the District of

Columbia Department of Energy and Environment (DOEE) which oversees DCSEU, the evaluation team (Tetra Tech, Leidos, and Baumann Consulting), and the DCSEU implementer, Vermont Energy Investment Corporation (VEIC). The objectives of the Pilot were to:

- Provide M&V feedback to the program implementers and staff sooner
- Allow the evaluation team improved access to customer sites where otherwise the customer may refuse access at year-end due to additional time commitment or difficulty coordinating
- Obtain a head-start on evaluation activities and significantly reduce the number of on-site verification visits needed at year-end to meet the sampling requirements
- Reduce customer fatigue and time spent on project verification.

Traditionally, DCSEU's M&V evaluation activities start soon after the end of the program year (October) and are completed within six months (March). As a result, the earliest that the evaluation recommendations could be acted on is roughly seven months following the completion of the program year, up to a year and a half following the completion of a project. Figure 1 illustrates the timing of the traditional evaluation for DCSEU compared to the timing of the Pilot. Figure 1 shows that the evaluation feedback could be available on select projects up to a year earlier than the traditional evaluation. If this effort were to continue into future years and start at the beginning of the program year, findings could be available as early as a year and a half sooner than the traditional evaluation. This would allow findings, that otherwise would not have been available, to inform savings calculations throughout the program year and the start of the next program year.

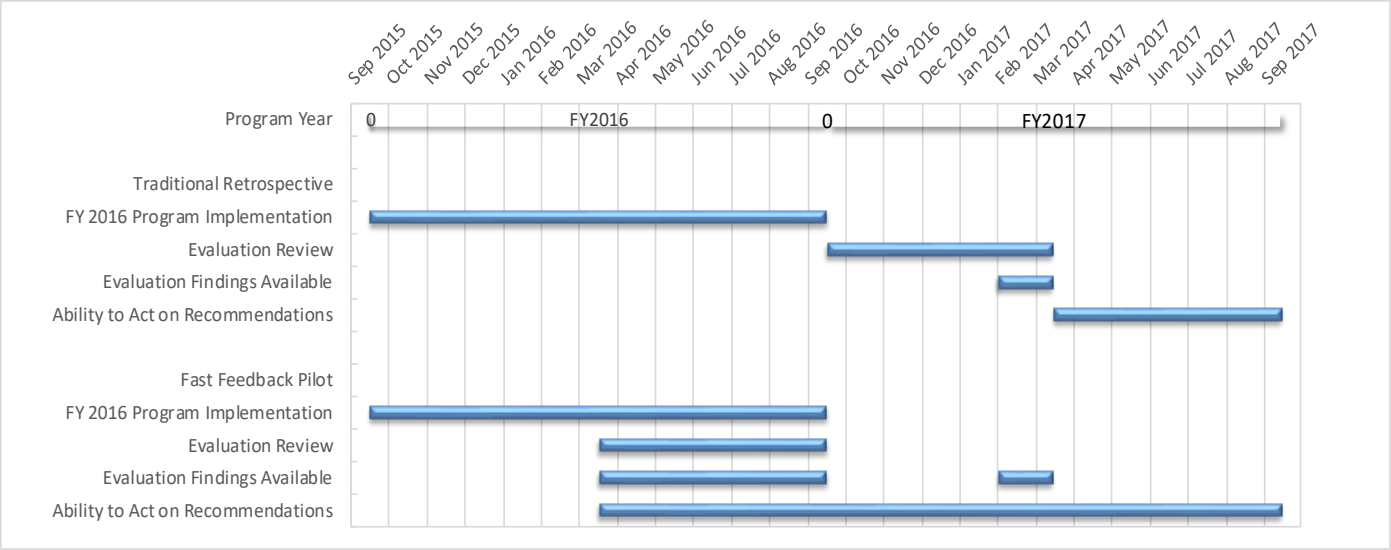

Figure 1. Timing of fast feedback evaluation Pilot compared to traditional retrospective evaluation

Concurrent evaluation also has the potential to improve the experience of customers interacting with the DCSEU. Most customers do not distinguish between the QA conducted by the program implementer and the M&V conducted by the evaluator. All participants recognize is that different people come back to them with similar questions, spaced out by a number of months, and in some cases up to 18 months after the installation of the energy conservation measure. Some of the more complex and custom installations can be time intensive, taking anywhere from one hour to three hours to conduct a

QA review on the installed projects. Once a participant has invested this amount of time to complete the initial QA review, it can be difficult to schedule a follow-on M&V evaluation visit. This can cause program participants to refuse to engage with the independent evaluation, or to grow annoyed and either not work with the DCSEU or caution their friends. DOEE staff members have heard these frustrations from building owners and managers in the District regarding this process, and it has provided an additional barrier or excuse for a customer to choose not to work with the DCSEU. The number of people who sometimes have to be present for an on-site review can provide an additional challenge in scheduling repeat evaluations. As many property management firms have high staff turnover, evaluators coming back a year or more after installation may not find staff members who remember the project. Furthermore, with the multifamily sector in particular, the need to coordinate with busy building managers and to inspect individual residential units present additional challenges to evaluation that are easier to address if it only needs to be done once.

Furthermore, conducting on-site M&V visits during the program year would lower the number of on-site M&V visits that would need to be conducted at year-end to meet the sampling requirement. This would help avoid bottlenecks that had occurred in prior years due to scheduling around the holidays and unexpected snow storms which have the potential to jeopardize obtaining a valid sample.

Pilot Approach

The Pilot team worked together to develop and implement a protocol to coordinate the evaluation team's independent third-party M&V activities with DCSEU's QA verification visits for 23 customer projects. This number was chosen to test the approach and process and represented roughly one half of the number of on-site M&V visits conducted during the prior year's evaluation (FY2015). The DCSEU implementation staff conducts QA inspection on 100% of equipment installations.

Projects targeted for fast feedback were those with larger energy savings, more complexity and risk in the savings estimates, and those in the multifamily market sector that historically were difficult to schedule on-site visits. The Pilot focused on the following program tracks: Commercial Prescriptive Equipment Replacement, Commercial Custom, and Low Income Multifamily. The evaluation team reviewed the project files and the M&V feedback directly following the on-site visits to generate high-level evaluation findings that were provided to the program implementation staff within a month of the project's closing. The feedback had the potential to change savings claims if discrepancies in equipment specifications, measure quantities, or underlying assumptions were identified. A more detailed engineering review of the final savings calculations was expected to take place during the year-end evaluation for FY2016 that was scheduled for spring 2017[1].

At the start of the Pilot, an implementation protocol for coordinating the on-site visits was put in place. A lead contact for each organization was established including a designated lead from Tetra Tech (Pilot lead), Baumann Consulting (M&V on-site visit lead), and DCSEU (QA coordination lead). The Pilot coordination process is outlined below.

1. DCSEU provided a list of relevant projects scheduled to close over the period of the Pilot from which the evaluation team identified projects that met the sampling savings thresholds or criteria. DCSEU was notified which projects were sampled that should receive a coordinated on-site visit.
2. DCSEU provided project files to the evaluation team for review that contained the most up-to-date savings calculations and detailed listing of the work that was done. From the files, the EM&V

[1] Due to an adjustment in the FY2016 evaluation approach, the year-end assessment did not take place.

team desk auditors provided the M&V on-site lead with a verification form that detailed the equipment installed and other pertinent information that required validation at the on-site visit.
3. DCSEU coordinated with M&V on-site lead and the customer to schedule the visit and the coordinated on-site visit took place.
4. The evaluation team's on-site M&V findings were documented in a report and provided to the evaluation team's desk auditor who conducted a high-level review of the findings and provided feedback to DCSEU.
5. The results and recommendations were discussed with the Pilot team in follow-up conference calls.

The Pilot team did not believe that M&V evaluation findings would be less objective due to implementation staff and evaluation staff interacting on site since the evaluation team prepares an M&V plan (e.g. checklist and data form) which the M&V staff follow. The on-site assessment might involve judgment calls, however the M&V staff are instructed to document these in their report so that any judgement calls are clear to the desk reviewers who are able to validate or override the decisions.

Sampling Methodology and Criteria

The goal of the sampling methodology was to select projects that the evaluation team likely would have sampled at the end of the year during a traditional evaluation. The EM&V team used the same sampling process for the Pilot as had been used to sample for commercial programs over the last several years; including large projects that met a certain criteria and a random sample of smaller projects. Savings thresholds were established for the prescriptive and custom tracks using data from the previous two fiscal years (FY) 2014 and 2015. The thresholds represented the top 10 percent in electric savings and the top 20 percent in gas savings (due to the relatively small number of gas projects). The analysis for FY2014–FY2015 data indicated that the electric savings threshold would be 100 MWh for prescriptive programs, 600 MWh for custom programs, and the natural gas savings threshold would be 4,500 MMBtu.

At the end of FY2016, a final data review would be conducted to identify any projects not included in the Pilot that had savings in the top 10 percent of electric savings and the top 20 percent of gas savings. As in the past, these projects are typically sampled with certainty, and a random sample of other projects are then chosen to meet sampling requirements. Multifamily custom projects were also included in the Pilot sample because it is difficult to conduct on-site visits at year-end for this track. Since there were so few of these projects during the year (24 in FY2016; however, most of the projects where completed prior to the start of the Pilot), we did not establish a savings threshold for the Pilot, but rather included all low income multifamily custom and comprehensive projects in the sample.

Results

At the conclusion of the Pilot period, fast feedback findings were provided for 23 projects. The savings reviewed totaled 3,220 MWh, 2,928 MMBtu, and 459 of summer kW. Of the FY2016 total energy savings, this review represented 4 percent of MWh savings, 2.83 percent of MMBtu and 4.67 percent of summer kW demand savings. A tally of the projects by program track is provided in Table 1. Due to staff turnover, the scheduling of the coordinated on-site visits did not fully get underway until July. Because of the delay, a number of the larger custom and prescriptive projects had already been completed and reviewed by the DCSEU's QA team leaving a smaller number of projects than expected that met the Pilot savings criteria. To help provide a larger pool to test the fast feedback approach, a random selection of smaller projects was added to the Pilot.

Table 1. Completed Pilot projects by track

Program track	Criteria	Projects that met criteria	Projects randomly sampled	Total
Commercial Prescriptive Equipment Replacement	100 MWh/4,500 MMBtu	4	9	13
Retrofit Commercial Custom	600 MWh/4,500 MMBtu	1	6	7
Low Income Multifamily Custom Projects & Low Income Multifamily Comprehensive	N/A	N/A	3	3
Total		5	18	23

Of the 23 projects, six where found to have no issues to report. The M&V review identified ten categories of findings. More than one finding could be, and often was, identified for each project. For the remaining 17 projects, the two most common findings noted that: 1) the hours of use or load hours reported were different then what was found on-site, and/or 2) that the number of fixtures installed differed from the number reported in the project files. Another common finding was that the assumptions and equipment specifications found at the site were different then the input assumptions for modeling and savings calculations in the project files. Baseline differences were also noted, and, in some cases, it was suggested that the baseline be verified by the DCSEU staff. It should also be noted the evaluation team also commented when the data and assumptions were in-line with expectations.

An example of high-level fast feedback evaluation findings from four of the on-site visits and the implementation team's response and follow-up is included in Table 2.

Table 2. Example of high-level fast feedback evaluation findings

Track	Project	Evaluation feedback to DCSEU	DCSEU Implementation follow-up
Prescriptive	1	• The building engineer verified that all six types of fixtures at this project were received, but that only five had been installed so far. The LED screw-in lamps had not yet been installed at the time of the inspection. • The building engineer also mentioned that several occupants were choosing not to use the newly installed LED lighting and had resorted to using incandescent task lighting because they were not happy with the brightness of the new LED lamps.	Changes were not made to project savings claim for this project; however, the lighting design feedback is important for DCSEU's function as a technical resource in the District marketplace.
	2	• The hours of use for all fixtures in the ex-ante documents were estimated at 8,760 hours; however, the site program participant building staff provided hours of use for all fixtures that were lower. For exterior fixtures, the building staff estimated 4,380 hours of use a year (12 hours per day) which is the same hours of use that would be estimated if the exterior lights are on photocell controls, although a photocell control was not found on-site. The interior fixtures were estimated at 3,650 hours per year. Using the hours of use obtained during the on-site inspection would greatly lower the savings of the project. • The fixture counts verified on-site were slightly lower than the amount of fixtures indicated in the ex-ante documents. This would result in a slight lowering of savings for this project.	DCSEU applied changes to the savings claim by reducing HOU and the quantity of installed lighting fixtures.
	3	• Slightly fewer fixtures (250) were found installed than the amount in the ex-ante documents (254). This would slightly lower the savings from the project. • The ex-ante documents indicated the LED troffers would be 31W fixtures, however the spec sheets provided by the personnel on-site indicated they were 50W fixtures. The invoices for the project did not list the actual fixture type installed. This would lower the savings for the project.	DCSEU did not apply a change to the quantity of fixtures claimed for this project: • The program currently uses a 97% In Service Rate (ISR) adjustment, meaning savings are claimed for ~246 fixtures after this adjustment - fewer than the 250 documented on site • The program uses deemed TRM algorithms for the LED troffer fixtures, so the fixture wattages were not adjusted. This is valuable feedback that should be incorporated into future TRM update efforts.
Custom	1	**Initial Site Visit** • The boiler was not fully connected at the time of the site visit, so operation could not be observed. • A review of the ex-ante calculations shows that a utility bill regression with ambient temperature was used as the basis of savings. One of the things we observed with the regression is that a 65^{o}F balance point was assumed for the natural gas regression, but it looked like the balance point is closer to 60 or 55. The June-August actual natural gas use is fairly consistent at a lower value than the results of the regression. Changing the balance point for the regression will result in a slight lowering of the project savings. **Follow-Up Site Visit** • Boiler was not installed at the time of the first site visit; the boiler was installed and operating in a lead/lag arrangement with an existing boiler during the second site visit. • A review of the ex-ante calculations shows that a utility bill regression with ambient temperature was used as the basis of savings. One of the things we observed with the regression is that a 65^{o}F balance point was assumed for the natural gas regression, but to us it looks like the balance point is closer to 60 or 55. The June-August actual natural gas use is fairly consistent at a lower value than the results of the regression. Changing the balance point for the regression will result in a slight increase of the project savings.	DCSEU made the recommended changes to a 55 F balance point for use in the utility bill regression. Lowering the balance point for heating resulted in lower HDD, which leads to greater year round usage from process DHW load. As the project is a DHW boiler replacement, this led to a higher project savings.

How to handle these recommendations for fast feedback adjustments was not discussed in great detail by the Pilot team, although DCSEU engineering and implementation staff did take the feedback from the findings under advisement and adjusted projects and processes as appropriate. Incentive payments were not retroactively adjusted. In some cases, the implementation team found that it was not cost effective to either go back to the site to reassess the installation or to update an eQuest model for a minimal amount of increased savings.

It was anticipated that these Pilot projects would be part of the FY2016 evaluation sample. During the retrospective evaluation, a more granular engineering desk review would be conducted as part of the impact evaluation process using final project files and final savings calculations as input to calculate the program end of year realization rates. However, due to an adjustment in the FY2016 evaluation approach, this year-end assessment did not take place. While continuous improvement has its benefits, there is some concern that the adjustments made could potentially produce a false sense of program performance, as similar errors would have been expected on other projects given a representative sample and would not have had the opportunity to be fixed. This issue is further discussed under the section entitled "Considerations for Future Research".

Benefits

The Pilot team considers the pilot a success in that it met the proposed objectives of quicker evaluation feedback, reduced customer fatigue, allowed for better site access, and provided a head-start on activities. The benefits as seen from the evaluation team and from the implementation team are described as follows.

The evaluation team found that when accompanied by the DCSEU QA staff they had increased access to building staff who were more likely to be knowledgeable, helpful, and who could answer questions than when conducting on-site visits on their own at year-end. During previous years of M&V visits, customers often complained that the QA staff had already visited the project that the time spent dealing with both teams was cutting into their business or other duties, and/or that the financial incentive provided for the project was not worth the hassle. Comments such as "Weren't you already here? " and "Had I known I had to spend so much time on this incentive, I would not have done it!" were not uncommon. These complaints markedly decreased during the Pilot. The evaluation team also found the discussions with DCSEU staff valuable for understanding the project. Furthermore, the evaluation team had access to sites, particularly low-income multifamily facilities, for which it had been difficult or impossible in the past to schedule on-site M&V visits at year-end. While the QA and M&V teams operated independently, the M&V staff now had the benefit of seeing the exact same equipment under the same conditions, and, in some cases, viewing the same real-time data as the QA staff. This was expected to reduce variability of the results. The coordinated approach also fostered teamwork between the evaluation staff and the DCSEU implementation staff on the inspections.

From the implementation team's perspective, feedback from the EM&V team was received while projects were still in the processing stage, which allowed for adjustments to the savings methodology or assumptions to be made as appropriate. DCSEU also leveraged the EM&V team's feedback on the projects reviewed through the pilot to make adjustments on other projects in the programs, with the goal of alleviating systemic errors in documentation and process. As noted by the evaluation team, conducting site visits in tandem also led to greater collaboration between the M&V evaluation staff and DCSEU program staff, involving the implementation staff in the evaluation process in a much more direct way. Their past exposure to evaluation results often came in the form of high level overviews and recommendations, and their direct involvement with the EM&V team gave them greater ownership of the evaluation process to spur ongoing improvement.

Challenges and Key Lessons Learned

Throughout the Pilot planning and implementation, the evaluation team and the implementation team

worked closely together to identify and address issues and challenges as they arose and to adjust the process as needed, resulting in several lessons learned that could lead to greater impacts in the future.

Streamline Processes

The initial back-and-forth process between the DCSEU implementation team and the evaluation team to identify the fast feedback sample was cumbersome and time consuming. The Pilot team agreed that establishing a set threshold at the beginning of the program year that would trigger an M&V coordinated on-site visit for projects that met the criteria would significantly streamline the process. This way, both the implementation team and the evaluation team would know in advance which projects would be reviewed and the DCSEU implementation team could easily flag those candidates. This process would require DCSEU staff to proactively identify and engage the evaluation team to coordinate on-site visits for those projects that meet the criteria. In the future, it may be most efficient to set up project completion alerts to notify the DCSEU implementation and evaluation teams when a project that meets the M&V fast feedback criteria is scheduled for completion. Early notification of planned on-site inspections would improve coordination. The evaluation team might also revisit sampling criteria for future fast feedback evaluation efforts to ensure validity of the sample at the end of the year.

The implementation team has suggested reducing the number of EM&V staff participating in project review to reduce turnaround time and process churn. The preliminary project review is currently a two-step process where DCSEU staff provides the project records to the evaluation team's M&V desk auditor who then provides a list (verification form) of equipment and data to the M&V on-site auditor to validate. The evaluation team prefers to have a five-day notice prior to the on-site visit to review the project documents and prepare an M&V plan for on-site visit staff. This five-day preparation period can sometimes pose challenges to scheduling the on-site visit with the customer. A more streamlined process will be examined further if the fast feedback effort continues in future years.

Effective Communication and Project Tracking

Communication is highly important to ensure the success of this coordinated approach. To improve communication across the staff it was critical to have clearly designated process leads on both the implementation and EM&V teams. Additionally, ensuring all parties are familiar with DCSEU program design and implementation approaches before site evaluation work begins would lead to greater value from the evaluation team's feedback. An important element of team communication involved maintaining an ongoing and synchronized tracking system between DCSEU and the evaluation team. The Pilot tracker (an Excel spreadsheet) maintained a list of relevant project information and data associated with the coordinated on-site visits. The Pilot tracker was updated by the implementation lead weekly and shared with the team.

Early in the Pilot process, the dynamic nature of concurrent QA and M&V on-site visits created challenges for planning and scheduling. Sometimes, the quick notification of an on-site visit would create a tight timeframe for the evaluation team to obtain and review project files in preparation for the visit. To help address these issues, we put in place communication protocols for the Pilot team. Weekly team meetings took place during the startup phase and when scheduling was heavy, which then was reduced to biweekly meetings or as needed when the project activity slowed down. These meetings provided a forum to address issues. A weekly status e-mail, generated by the implementation team lead, was started later in the process to inform the team of the scheduled and planned project visits. This communication proved useful for planning purposes. To ensure that the evaluation team's M&V staff had the necessary customer information and to keep the Pilot team informed of the scheduled on-site visits, the implementation team sent a calendar invitation.

Keeping lines of communication open across the Pilot team was also important so that issues or concerns

could be quickly and properly addressed. For example, some QA implementation staff raised the concern that they felt that the M&V staff were evaluating their performance rather than simply evaluating the project. This perception may have been, in part, due to questions (e.g., approaches to calculating savings and verifying) that the evaluation team desk audit staff asked the M&V staff to investigate when they were on-site. The QA staff raised this issue to their implementation team lead who, in turn, addressed the issue with the evaluation team lead. The evaluation team lead shared this perception internally with the M&V staff who committed to being more aware of how their actions could be perceived. The implementation team lead followed up with their staff, and no similar concerns were raised thereafter. The implementation lead also worked with the QA staff to help them better understand the goals of the Pilot, which many did not fully understand. Working as a team to address these types of issues was important to achieving a successful result.

Maintain the Efficiency of QA/M&V Coordination On-Site Visits

Part of the value of conducting coordinated on-site implementation QA and M&V visits is the ability to reap efficiencies in conducting the evaluation M&V on-site visit. Scheduling back-to-back on-site visits where possible was found to be a time saver. There was an instance where the on-site visit was scheduled; however, when the team arrived at the customer site they found that the equipment was not operational. Finding ways to minimize these false completions is important to keeping on-site evaluation costs down since traditionally the M&V staff go out after the project is completed and verified. Along similar lines, ensuring that the on-site evaluation visits start on time and that both the evaluation and implementation staff arrive at the participant site on time would also help manage costs. Streamlining the process and creating effective communication and tracking protocols as discussed above will be important to making the M&V on-site visits more cost effective. This will be an important consideration for using this approach beyond the Pilot period.

Applying Recommendations

More discussion needs to take place with the Pilot team and relevant technical staff about how best to address fast feedback findings. In some cases it was unclear how the implementation team should address the feedback, if at all. For example, differences in the savings claim approach for prescriptive measure rebates (based on deemed TRM values) versus custom comprehensive projects led to some confusion on the implementation staff's part as to how the feedback from the EM&V team should be incorporated. In some cases, feedback on installed equipment specifications and operation schedules could be cataloged and fed back into the TRM update process rather than used to adjust specific project savings claims. The Pilot tracker would be a valuable resource for identifying recurring issues for such TRM updates. Working through the findings with the technical staff and having an ongoing dialog would help to clarify how feedback might be actionable or if the intent is to help provide feedback to program design.

Considerations for Future Research

It would be valuable to better understand the effects of fast feedback evaluation and the continuous improvement process on the resulting year-end realization rates. As previously mentioned, since realization rates are determined from a sample of projects and applied to the savings numbers for the full population, the fact that DCSEU can adjust its findings based on the evaluation team's fast feedback may skew the results. Theoretically, DCSEU could adjust the savings numbers to be more accurate for projects with coordinated on-site visits (which is one of the goals of the Pilot), but since the remainder of the projects are not receiving this real-time scrutiny, the same issues in similar projects may not be detected until the end of the year evaluation (if sampled) or not at

all. This could have the unintended effect of different realization rates for the populations receiving fast feedback findings with rates much closer to 1.0, than the realization rates for the population without early evaluation feedback. This is mitigated in part by the fact that the largest projects are sampled, so evaluation covers a larger proportion of overall program savings.

The processes for taking early feedback into account for reporting and evaluation would need to be clarified if this approach is continued in the future. To avoid bias and to be able to provide fast feedback, the implementation and evaluation teams need to identify possible protocols for responding to early feedback, and the teams would discuss the findings and agree upon a resolution. These protocols should be included in evaluation plans so they are formalized for implementation, evaluation, and other stakeholders. They would take into account whether the issue was systematic to the program or individual to a project. This might also require some additional evaluation work, or at least adjustment to timing of some activities, to review how the implementation team responded to the feedback.

Other areas where fast feedback evaluation could add value include: monthly/quarterly customer satisfaction surveys, targeted process evaluation for new or revised initiatives, net–to-gross research activities, and custom calculation review for larger custom projects or projects using new calculation approaches. These are potential future evaluation considerations for DCSEU to explore.

Conclusions and Recommendations

The Pilot team believes that the Pilot achieved its objectives and that it recognized the intended benefits outlined in the Pilot's purpose. The Pilot was informative and a number of issues—particularly process issues—were resolved during the effort that can make this fast feedback approach more effective in the future. Furthermore, the DCSEU staff and the EM&V staff improved collaboration over the course of the Pilot. DOEE plans to continue evolving the fast feedback approach in FY2017, keeping in mind the lessons learned and future considerations highlighted above, in order to refine the efficiency of the process and to better understand the impacts that continuous improvement has on end-of-year realization rates.