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## Interim Recommendations for Improved Measurement & Verification

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Measurement and Verification (M&V) of guaranteed savings is critical to the success of the Colorado Energy Performance Contracting (EPC) Program and its Clients' projects.

A Client's satisfaction with, even enthusiasm about, facility improvements can be undermined by a process that does not address operational deficiencies as soon as possible, or an untimely M&V Report that does not clearly communicate performance against guarantee. Client dissatisfaction undermines the credibility of the entire EPC Program.

The Colorado Energy Office (CEO) last issued *Measurement and Verification Guidelines* in 2008. With support from the Colorado Offices of the State Architect and Attorney General and the Colorado Chapter - Energy Services Coalition, CEO will issue new guidelines in FY 2015. Those guidelines will be integrated into the concurrent update to state contract documents. Our intent is to reinforce M&V as validation of EPC's usefulness in extending the benefits of energy efficiency to all Colorado's public jurisdictions.

In the interim, CEO and the Offices of the State Architect and Attorney General suggest the following recommendations be incorporated into current and active contracts. These interim recommendations are based upon experience in reviewing and discussing M&V Reports with Clients and their ESCOs.

Successful M&V begins upstream in the EPC process. As such, these interim recommendations are organized by step in the EPC process.

## Step 1: Introductions and Approval

- A. Potential Clients should begin learning about the various M&V options and how the M&V details impact the overall project regarding confidence in savings, and persistence of savings. Both CEO and its pre-qualified ESCOs should provide an orientation to Clients, including all or parts of CEO's updated M&V 101 presentation in their outreach and business development efforts.
- B. Consider framing M&V as follows: As with Technical Energy Audits, there is a cost associated with M&V. **Present M&V as a valued component of the project, rather than a financial burden.**

## Step 2: ESCO Selection Phase

- A. In the ESCO solicitation and during interviews, Clients should ask candidate ESCOs about their M&V practices. ESCOs should be prepared to spend a minimum of five minutes discussing their M&V approach. Topics to cover are:
  - 1. Describe how M&V fits within your projects.
  - 2. Describe how your M&V team fits within your organization and how it would fit in your project team.
  - 3. How do you help Clients determine the best IPVMP option, monitor/control the risk of savings shortfalls, for each FIM?
  - 4. Which IPMVP options do you typically use for various Facility Improvement Measures (FIMs)?
  - 5. Do you provide any occupant engagement or continuous monitoring options?
  - 6. How often are you on site during the M&V period?
  - 7. Do you use any 'guarantee factors' or other factors in your calculations or M&V reporting and, if so, how do they work?
  - 8. What is the process you use to do inspections, develop and review reports? Can we meet the team that will be doing the M&V work?
  - 9. Can you provide a sample M&V report?
- B. When checking references, Clients may ask about experience during the M&V process.

## Step 3: Technical Energy Audit & Project Development

This is by far *the most important time* in an EPC project for determining the overall M&V process, as the M&V Plan is developed during this step. During this step, an ESCO should:

- A. Include CEO representation in all M&V meetings and key correspondence.
- B. Provide an M&V presentation/education session prior to the time of the preliminary TEA results, to help Clients understand M&V issues. M&V should be presented as a valued component of the project rather than a financial burden.

- C. Hold an additional M&V meeting prior to the final TEA meeting. M&V should be presented as a valued component of the project rather than a financial burden.
- D. Discuss the difference between “potential to perform” guarantee savings and utility bill savings.
- E. Include broad representation from the Client to ensure that agreed upon setpoints and schedules are realistic and understood. At minimum, that representation includes finance and facilities interests. Solicit input from opinion leaders amongst the building occupants. Educate the facilities staff and occupant opinion leaders that these items become the bases for the savings and are incorporated into the EPC as owner responsibilities.
- F. Include building operation and maintenance staff training. Provide monthly/quarterly/semiannual maintenance checklists with provision for staff sign-offs. Consider signage at or near equipment, light switches, and thermostats.
- G. Consider including remote monitoring and diagnostics in the M&V Plan or as a separate ECM (or FIM), to ensure the persistence of savings. Reflect cost as a line item in budget proposals.
- H. Consider including an occupant engagement/education/training system, to ensure buy-in and support from occupants, who might otherwise, intentionally or accidentally override savings strategies. Consider signage at or near equipment, light switches, and thermostats.
- I. Allow Client to choose no utility rate escalation. If the Client does agree to a utility rate escalation, use a conservative approach in identifying the escalation rate to minimize financial risk to Client. Provide Client and CEO with a description of and justification for the utility rate escalation.
- J. **Per the ESCO Base Contract**, ensure that the cost-weighted average equipment lifetime exceeds the financing contract term. **This is a statutory requirement for every EPC executed with a public jurisdiction in Colorado. Consult the EPC webpage for specific statutory references.** Use conservative estimates for equipment lifetime and escalation rates, to ensure that Clients will be satisfied with results 10 to 20 years in the future.
- K. Consider a conservative approach to quantifying and guaranteeing any potential operations, labor, material purchase and other maintenance savings.
- L. Develop an M&V Plan:
  1. Per the ESCO Base Contract, follow the outline for the M&V Plan and process included in the CEO’s *2008 M&V Guidelines*.
  2. Provide clear details about the exact scope, schedule and budget of the M&V activities, rather than a brief overview. Details may include the cost by FIM, benefit of quarterly review versus annual review by FIM or IPVMP option, and a short description of the building/occupant factors that can impact the savings.
  3. Consider and discuss with Client including a minimum of quarterly site visits during the first performance year, and a minimum of annual site visits every subsequent performance year. Multiple site visits every year are encouraged to improve Client relationships. On-going communication through each performance year will ensure any issues are realized sooner than later, and solutions are developed in an effective manner.

4. Arrange and conduct site visits with facility manager(s).
  5. Within 24 hours of each site visit, inform Client finance and facilities managers and CEO project consultant of any deficiencies on-site, in writing by email or letter. Underscore the importance of resolving deficiencies as soon as possible, so as not to undermine savings.
  6. CEO recommends that ESCOs do not use safety factors or guarantee factors, especially as they relate to calculated or stipulated savings, as this is very confusing to Clients and can lead to lack of confidence in reported savings. If used, clearly define any safety factors or guarantee factors that will be used. Describe how they will be used or removed in reporting the guaranteed savings in the M&V reports, and what conditions change their value or dictate their use between TEA and M&V reporting.
  7. Consider and discuss with Client an option to provide utility bill tracking/analysis to improve transparency and Client confidence in EPC, even if Option A or other non-utility-bill M&V options are used to verify meeting the guarantee.
  8. Consider including monthly phone calls or a similar strategy for maintaining regular communication with the Client during the M&V period, to ensure that small problems are identified and addressed quickly.
  9. Clearly specify the timing of the delivery of the draft post-installation report and annual M&V reports as well as timing for delivery of the final reports. Delivery dates should be 30-60 days from performance period end.
  10. Allow up to two weeks for CEO to review an electronic copy of the M&V Plan prior to Client acceptance.
- M. If your M&V team is separate from your business development or project team, allow M&V team input and review of the draft M&V plan.

#### Step 4: Energy Performance Contract & Construction

- A. Update and finalize the M&V Plan to include any changes that occurred after finalization of the TEA.
- B. Include the final M&V Plan as a schedule to the EPC.
- C. Provide up to two weeks for CEO review of the EPC prior to Client acceptance.
- D. Provide electronic copies of the signed EPC and any contract modifications.
- E. Provide Client with a compilation of maintenance schedules as identified in warranties. This compilation should be readily accessible to maintenance staff, in a useful format.
- F. **Per the ESCO Base Contract**, develop a Post-Installation Report (PIR).
  1. Document any changes in project scope of work, cost, savings, etc.
  2. Send draft PIR to Client and assigned CEO project consultant.
  3. Hold a draft PIR review meeting with Client and assigned CEO project consultant.
  4. Send final PIR to Client and assigned CEO project consultant. The final PIR addresses and incorporates all relevant comments.
- G. Provide an M&V review meeting to inform existing and any new staff of how M&V will work and set appropriate expectations of future M&V activities. Provide an overview of the EPC project and review with finance and facilities staff the importance of

maintaining agreed-upon setpoints and schedules, impact to savings, warranty time periods and problem resolution responsibilities, and the M&V period activities and schedule.

## Step 5: Measurement & Verification of Guaranteed Savings

- A. **Per the Energy Performance Contract with the Client**, deliver M&V services as described in the M&V Plan.
- B. If your M&V team is separate from the business development or project team, ensure communication between those teams.
- C. Communicate regularly with the Client to ensure that small problems are quickly resolved, potential lost savings are minimized, and that any warranty issues are resolved during the warranty period.
- D. Plan site visits in advance for the year, based on the specifications in the M&V Plan. CEO recommends quarterly site visits for the first year, and multiple site visits for all years in the performance period.
  - 1. Provide adequate notice in scheduling site visits to ensure facility manager(s) availability and participation.
  - 2. When scheduling a site visit, include a pre-visit and post-visit meeting with any Green Team and/or a broad representation of Client staff to ensure issues are communicated and problems resolved quickly.
  - 3. Within 24 hours of each site visit, inform Client finance and facilities managers and CEO project consultant of any deficiencies on-site, in writing by email or letter, identified by on-site or remote monitoring systems.
- E. In the draft M&V Report:
  - 1. Provide the date of submission on report cover page. CEO will use this to ensure reports are delivered no later than 60 days from the end of the performance period.
  - 2. Provide a summary table showing the key dates in the project to date. Include dates and key amounts such as project totals and savings guarantees, including previous year and cumulative totals. Note the dates of contract signing and any modifications.
  - 3. Cite the source of any data referenced in other documents (EPC contract, TEA) and attach exhibits so M&V Report is a standalone document.
  - 4. Per ESCO Base Contract, follow the M&V Plan Outline in the CEO M&V Guidelines.
  - 5. Use remote monitoring and/or occupant engagement where possible to ensure savings are being met and raise the profile of the importance of the energy savings.
  - 6. Provide a utility bill analysis against baseline, even if this analysis is not required to demonstrate guarantee.
  - 7. Do not use the term “achieved,” “verified,” “excess,” or “actual” for savings that were guaranteed, but not achieved due to operator error. Instead, use the terminology “claimed” or similar term.

8. Provide a comparison of rates used for calculating the guarantee (agreed to during the contract negotiations), to actual rates during the performance period.
- F. Deliver the draft M&V report to Client's finance and facility managers and CEO within 60 days of M&V year end, or as otherwise specified in the EPC contract.
- G. Provide up to two weeks for Client and CEO review of draft M&V Report.
- H. Upon receipt of Client and CEO comments, prepare a response. Email the response back to the Client and CEO within one week.
- I. Within one week of the email response to Client and CEO comments, conduct a draft M&V Report review meeting in person or by phone with Client's finance and facility managers and CEO. If Client staff has changed, hold an EPC M&V review meeting (as described in the previous step).
- J. Within two weeks, provide a final M&V report electronically to Client and CEO. The final report incorporates and addresses all relevant comments.