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Too Vague to Fail? M&V Plans in Federal ESPCs

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Outline

- **Key shortcomings observed in M&V plans:**
 - Mis-attribution of IPMVP options
 - Use of simulations without measurement
 - Amorphous performance period measurement
 - Insufficient use of Options B & C
 - Out-of-proportion savings claims
- **Towards a more transparent future**
 - FEMP's plans
 - Advice to agencies

Mis-attribution of M&V Options

- **Review of IPMVP retrofit isolation options:**
 - *A: Key parameter measurement:* the most critically affected variable needs to be measured before *and* after installation
 - *B: All parameter measurement:* all relevant factors to be measured before and after
- **What we've seen in actual projects:**
 - “Option A”: Occupancy sensors ECM: occupancy hours logged in audit, then held constant; no post- measurement
 - Unacceptable: something must be measured during performance period (such as testing of sample to assess turn-off ability, times)
 - “Option B”: “[ESCO] will commission the system and monitor conditions for a two-week period to verify efficiency”
 - Eh? Acceptable (recommended) “B” would be metering system output and adjusting for actual solar insolation, as needed

Simulation w/out measurement

- **Example: Controls system upgrade**
 - A “calibrated simulation model will be used as the basis for determining baseline and post-installation energy use”
 - “*Performance Period*: [ESCO] will review semi-annual trend data for a sample group of HVAC systems to verify that the DDC/BAS maintains its operational parameters to preserve savings.”
- **ESCO called this an Option A (not D). Is this okay?**
 - Does commitment to “review semi-annual trend data” constitute *measurement* (i.e., “calibration”)?
 - TX A&M response: “This is not M&V.”
 - PECI (Lia Webster): It’s not specifically prohibited, but to call it Option A the key parameters need to be measured in performance period

Amorphous measurement commitments

- EX: “[ESCO] will review semi-annual trend data for a sample group of HVAC systems ...”
- EX: “Upon acceptance, the values of the variables used in the calculations will be verified and remain fixed throughout the remainder of the contract term.”
- These statements are vague and unhelpful b/c they don’t commit the ESCO to anything
 - “The first thing I ask myself when I review these plans is ‘how could the ESCO fail?’ If there’s no answer, there’s a problem.” (John Shonder, ORNL)

Insufficient Use of Options B & C

- B & C are “Cadillacs” of M&V
- **Granted:**
 - B & C are overkill for many ECMs (e.g., lighting retrofit, 1-for-1 chiller replacements, etc.)
 - B & C put ESCO at greater risk, esp. as term extends and static variables (e.g., loads) change at site
- **However, B & C make sense in many instances**
 - EX: any generation ECM (B)
 - EX: steam decentralization (C)
- **Compromise with C is short-term (1-3 year) application, after which A is used**

Out-of-proportion savings claims

- **EX: modeled water savings (using assumptions for usage) exceeded total sites' water consumption**
- **EX: summed savings over numerous option A ECMs totaled 40% of campus's electricity**
 - ECMs were pretty comprehensive, but 40% seemed like a stretch to me (and site agreed)
- **Simple remedy: have ESCO show ECM savings as percentage of total site use**
 - E.g., “This ECM saves 11% of all electricity at site.”
 - This provides simple reality check, esp. in unison with some benchmarking figures (e.g., lighting usu. ~ 20% of comm. building electricity) from ASHRAE, CBECS, etc.

FEMP M&V Review Strategy

- LBL is reviewing all M&V plans in CY '10
- Training will be administered to PFs and Lab “Core Team” reps
 - goal is to both improve and harmonize reviews among different reviewers
- An M&V review software tool has been developed and is being tested
- Some in-depth on-site reviews are being conducted of a sample of projects
 - not exclusively directed at M&V, but considerable focus

Advice to Agencies

- **Don't despair and don't abandon ESPC!**
- **Watch for five common shortcomings**
 - Mis-attribution of options
 - Use of simulations w/out measurement
 - Amorphous performance period measurement
 - Under-use of Options B & C (where warranted)
 - Out-of-proportion savings claims
- **Make use of assistance from FEMP**
 - PFs are knowledgeable on M&V
 - Also, assigned Lab reviewer can assist
- **More (better) help coming from FEMP soon**