

M&V Plan and Savings Calculation Methods Outline

v. 1.0, Nov. 2013

[Note: All content called for in this outline is required (if applicable), except items noted as optional.]

1. Executive Summary / M&V Overview & Proposed Savings Calculations

1.1 Proposed Annual Savings Overview

Table 1. Proposed Annual Savings Overview

[Include all applicable fuels / commodities for project, e.g., electric energy, electric demand, natural gas, fuel oil, coal, water, etc.]

ECM	Total energy savings (MBtu/yr)	Electric energy savings (kWh/yr)	Electric demand savings (kW/yr)*	Natural gas savings (MBtu/yr)	Water savings (gallons/yr)	Other energy savings (MBtu/yr)	Total energy & water cost savings, Year 1 (\$/yr)	Other energy-related O&M cost savings, Year 1 (\$/yr)	Total cost savings, Year 1 (\$/yr)
Total savings									
First Year Guaranteed Cost Savings: \$									
<p><u>Notes</u> *Annual electric demand savings (kW/yr) is the sum of the monthly demand savings. MBtu=10⁶ Btu. If energy is reported in units other than MBtu, provide a conversion factor to MBtu for link to delivery order schedules (e.g., 0.003413 MBtu/kWh).</p>									

1.1.1 Site Use and Savings Overview (Optional)

- Fill in Table 1A or provide equivalent information.

Table 1A. Site Use and Savings Overview (Optional)

	Total energy (MBtu/yr)	Electric energy (kWh/yr)	Electric demand (kW/yr)*	Natural gas (MBtu/yr)	Water (gallons/yr)	Other energy (MBtu/yr)
Total proposed project savings						
Usage for entire site**						
% Total site usage saved						
Project square footage (KSF)						
Total site square footage (KSF)						
% Total site area affected						
<p>Notes</p> <p>MBtu=10⁶ Btu</p> <p>*Annual electric demand savings (kW/yr) is the sum of the monthly demand savings.</p> <p>**Define usage period.</p> <p>KSF = 10³ square feet.</p> <p>If energy is reported in units other than MBtu, provide a conversion factor to MBtu for link to delivery order schedules (e.g., 0.003413 MBtu/kWh).</p>						

1.2 M&V Plan Summary

Table 2. M&V Plan Summary

ECM.	ECM Description	M&V Option Used*	Summary of M&V Plan

M&V options include A, B, C, and D. Guidelines include *M&V Guidelines: Measurement & Verification for Federal Energy Projects, Version 2.2* (www.eere.energy.gov/femp/financing/superespcs_mvresources.cfm); and *International Performance Measurement & Verification Protocol (IPMVP)*, Volume I, March 2002 (www.ipmvp.org).

2. Whole Project Data / Global Assumptions

2.1 Risk & Responsibility

- 2.1.1 Summarize allocation of responsibility for key items related to M&V.
- Reference location of Risk & Responsibility Matrix¹ (if required).

2.2 Energy, Water, and Operations & Maintenance (O&M) Rate Data

- 2.2.1 Detail baseline energy and water rates.
- 2.2.2 Provide performance period rate adjustment factors for energy, water, and O&M cost savings, if used.

2.3 Schedule & Reporting for Verification Activities

- 2.3.1 Define requirements for witnessing of measurements during:
- Baseline development
 - Post-installation verification activities
 - Performance period
- 2.3.2 Define schedule of verification reporting activities.

Table 3. Schedule of Verification Reporting Activities

Item	^a Recommended time of submission	^a Owner's review and acceptance period
Post-Installation Report	30 to 60 days after acceptance	30 days
Annual Report	30 to 60 days after annual performance period	30 days

^aTimes are recommended based on industry practice; modify as needed.

- 2.3.3 Define content and format of reports:
- Post-installation report.
Use Post-Installation Report Outline¹.
 - Annual M&V reports.
Use Annual Report Outline¹.

¹ The Risk/Responsibility Matrix is Attachment 5 of the Super ESPC IDIQ contract and is also available on FEMP's web site at www.eere.energy.gov/femp/financing/superespcs_mvresources.cfm.

¹ Electronic copies of *Post-Installation Report Outline* and *Annual Report Outline* are available at www.eere.energy.gov/femp/financing/superespcs_mvresources.cfm.

- Interval M&V reports
Develop report outline if needed.

2.4 Operations, Preventive Maintenance, Repair, and Replacement Reporting Requirements

2.4.1 Define Government and ESCO reporting requirements:

- Summarize key verification activities and reporting responsibilities of government and ESCO on operations, preventive maintenance, repair, and replacement items from details in ECM specific M&V Plans.
- Define content of reports and reporting schedule.

2.5 Construction Period Savings

2.5.1 Provide overview of how construction period savings will be calculated, if applicable.

2.6 Status of Rebates

- Include if applicable.

2.6.1 Provide a summary of the source of any third-party rebates or incentives provided on this project.

2.6.2 Provide status of any third-party rebates or incentives.

2.7 Dispute Resolution

2.7.1 Describe plan for resolving disputes regarding issues such as baseline, baseline adjustment, energy savings calculation, and the use of periodic measurements.

3. ECM [Name / #] M&V Plan and Savings Calculation Methods

- Develop section for each ECM.

3.1 Overview of ECM, M&V Plan, and Savings Calculation for ECM

3.1.1 Summarize the scope of work, location, and how cost savings are generated.

- Describe source of all savings including energy, water, O&M, and other (if applicable).

- 3.1.2 Specify the M&V guideline and option used¹.
- 3.1.3 Provide an overview of M&V Activities for ECM.
 - Explain intent of M&V plan, including what is being verified.
- 3.1.4 Provide an overview of savings calculations methods for ECM.
 - Provide a general description of analysis methods used for savings calculations.

3.2 Energy and Water Baseline Development

- 3.2.1 Describe in general terms how the baseline for this ECM is defined.
- 3.2.2 Describe variables affecting baseline energy or water use.
 - Include variables such as weather, operating hours, set point changes, etc.
 - Describe how each variable will be quantified, i.e. measurements, monitoring, assumptions, manufacturer data, maintenance logs, engineering resources, etc.
- 3.2.3 Define key system performance factors characterizing the baseline conditions.
 - Include factors such as comfort conditions, lighting intensities, temperature set points, etc.
- 3.2.4 Define requirements for government witnessing of measurements if different than whole project data requirements included in Section 2.3.
- 3.2.5 Provide details of baseline data collected, including:
 - Parameters monitored/measured
 - Details of equipment monitored, i.e. location, type, model, quantity, etc.
 - Sampling plan, including details of usage groups and sample sizes
 - Duration, frequency, interval, and seasonal or other requirements of measurements
 - Personnel, dates, and times of measurements
 - Proof of government witnessing of measurements (if required)
 - Monitoring equipment used
 - Installation requirements for monitoring equipments (test plug for temperature sensors, straight pipe for flow measurement, etc.)
 - Certification of calibration / calibration procedures followed
 - Expected accuracy of measurements/monitoring equipment
 - Quality control procedures used
 - Form of data (.xls, .cvs, etc.)
 - Results of measurements (attach appendix and electronic forma as necessary)
 - Completed data collection forms, if used

¹ Guidelines include *M&V Guidelines: Measurement & Verification for Federal Energy Projects*, Version 2.2 (www.eere.energy.gov/femp/financing/superespcs_mvresources.cfm); and *International Performance Measurement & Verification Protocol (IPMVP)*, Volume I, March 2002 (www.ipmvp.org). M&V options include A, B, C, and D.

- 3.2.6 Provide details of baseline data analysis performed, including:
- Analysis using results of measurements
 - Weather normalized regressions
 - Weather data used and source of data

3.3 Proposed Energy & Water Savings Calculations and Methodology

- 3.3.1 Provide detailed description of analysis methodology used.
- Describe any data manipulation or analysis that was conducted prior to applying savings calculations.
- 3.3.2 Detail all assumptions and sources of data, including all stipulated values used in calculations.
- 3.3.3 Include equations and technical details of all calculations made. (Use appendix and electronic format as necessary.) Include description of data format (headings, units, etc.).
- 3.3.4 Details of any savings or baseline adjustments that may be required.
- 3.3.5 Detail energy and water rates used to calculate cost savings.
- Provide performance period energy and water rate adjustment factors, if different from in section 2.2.2.
- 3.3.6 Detail proposed annual savings for this energy conservation measure for performance period.
- Summarize information in Table 4.

3.4 Operations and Maintenance and Other Cost Savings

- 3.4.1 Provide justification for O&M cost savings, if applicable.
- Describe how savings are generated
 - Detail cost savings calculations.
 - Provide performance period O&M cost savings adjustment factors, if different from in section 2.2.2.
- 3.4.2 Provide justification for other cost savings, if applicable.
- Describe how savings are generated.
 - Detail cost savings calculations.
 - Provide performance period adjustment factors, if different from in section 2.2.2.