



MEASUREMENT AND VERIFICATION FUNDAMENTALS

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MODULE
02

What is M&V

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What is M&V

"Measurement and Verification" (M&V) involves planning, measuring, collecting, and analyzing data to verify and report energy savings from energy conservation measures (ECMs) in a facility. Energy savings cannot be directly measured. Instead, savings are calculated by comparing measured use before and after a project, adjusting for conditions.



LEARNING OBJECTIVES

- ✓ What is M&V?
- ✓ Definition of M&V
- ✓ Measurement and verification processes
- ✓ Important of M&V and its purpose
- ✓ Measurement and verification (M&V) Challenges

M&V activities

- Meter installation calibration and maintenance,
- Data gathering and screening,
- Development of a computation method and acceptable estimates,
- Computations with measured data, and
- Reporting, quality assurance, and third party verification of reports.





- M&V methods may not be needed to calculate savings when a project's outcome is clear or there is no need to prove results. However, it is wise to verify (initially and repeatedly) that the installed equipment produces the expected savings.
- Operational verification involves inspection, commissioning, functional performance testing, and/or data trending to determine savings potential. Operational verification and savings accounting are part of IPMVP-adherent M&V.

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Measurement and verification Importance

Measurement and verification (M&V) involves planning, measuring, collecting, and analyzing data to verify and report energy savings from energy conservation measures (ECMs) in a facility. Water savings and conservation follow the same definition and principles.

Energy savings are unmeasurable. Instead, savings are calculated by comparing measured use before and after ECMs and adjusting for conditions.



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M&V is extremely important because:

- Provides accurate feedback over time to ensure that savings are sustained and to highlight improvement opportunities.
- Assists facility managers in ensuring efficient operations and maintenance.
- Explains the monetary aspects of energy conservation improvements.
- Provides the capacity to assess and mitigate EPC risks.
- When reporting energy savings for compliance with regulations or to participate in emissions trading.

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Measurement and verification (M&V) Challenges



- Measuring avoided energy use (against a "what could have been" energy baseline).
- Implementing proper adjustments for factors such as weather, production volume, level of occupancy, etc. within and beyond control.
- Accounting for interactive effects (for instance, when implementation of an ECM will have an influence on the energy consumption of other equipment).
- Remaining consistent with existing standards, other projects, and time.
- Ensuring a proper trade-off between rigor (accuracy and confidence) and effort.
- Balancing the interests of all involved parties
- Aligning with local market specificities



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