

# Relevance of International Performance Measurement & Verification Protocol (IPMVP) for India



*An Association of Energy Efficiency Companies & Organizations*

# About AEEE

- AEEE is a not-for-profit, member-driven association of Energy Efficiency (EE) companies & organizations
- Founded in 2008, AEEE provides a common platform for collaboration among EE public and the private sector bodies and Govt agencies
- Large corporate members include Schneider Electric, Grundfos Pumps, Siemens, SKF Ltd, Thermax (a founder) among 60+ members
- Aligns with national priorities on energy efficiency – EC Act, BEE, CERC & ERCs, NMEEE, and partners with EESL and other public bodies

**Vision: An Energy Efficient India**

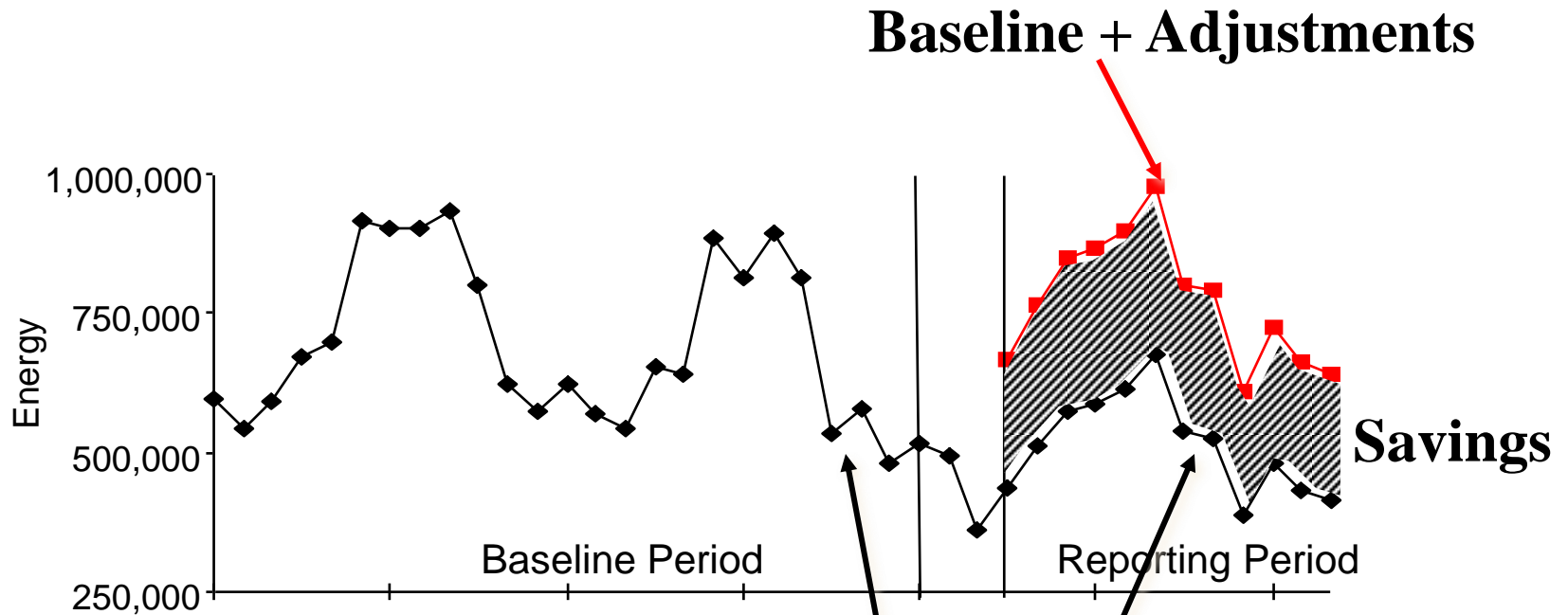
# What is M&V?

“Measurement & Verification (M&V) is the process of using measurements to reliably determine actual saving created within an individual facility by an energy management program.”

# Purposes of M&V

1. Increase Energy Savings
2. Document financial transactions
3. Enhance financing for efficiency projects
4. Improve design, operations and maintenance
5. Account for variances from the budgeted energy costs
6. Support evaluation of efficiency programs
7. Educate plant users about their energy impacts

# A Notional Baseline



**Baseline + Adjustments**

**Savings**

Baseline Period

Reporting Period



**Metered Energy**

# M&V Basic Equation

The Basic M&V Savings Equation #1:

Savings reported for any period

= Baseline Period energy

- Reporting Period energy

+/- Adjustments

# Adjustments

Examples of why we need Adjustments:

–An energy retrofit was performed but plant *production was also lower* this year than last.

How much of the resultant cost reduction was due to the retrofit, and how much was due to the production change?

– In a retrofit for HVAC, adjustment for weather is necessary to account for mildness or severity of summer.

# Areas for Applications of M&V in India

- Perform, Achieve and Trade (PAT)
- ESCO Projects (Performance Contracting)
- Demand Side Management (DSM)
- Green Buildings
- Clean Development Mechanism (CDM) Projects
- Urban Infrastructure
- Savings through ECMs in Industry



# Cost Concerns of M&V

- Total annual cost to determine savings should normally be less than 10% of the annual savings. *(might be exceeded for special situations)*
- 3-5% is a more common expenditure (for ESCO projects)
- 0% is often chosen (indicating “deemed savings”). No measurement means uncertain savings. This is NOT an IPMVP method

# Performance Contracts

- M&V plays a critical role in performance contracts:
  - maximizes the savings and the persistence of savings over the contract term (when long-term M&V is used)
  - documents what savings were achieved and acts as the “cash register” for the exchange of value
- Performance contracts allocate the costs and benefits of M&V accurately between the ESCO and Owner.
- Carefully consider contract motivations of all parties before designing the M&V. Append the M&V Plan to the contract.

# Common Issues with M&V Methods

- Different Approaches to calculate Energy Saving, Energy Cost Saving, Accuracy etc. and Different Terminologies/Definitions
  - Results in communication gap, across the geographies and among different stakeholders,
- Completeness of the M&V Plan itself?
- How to account for different variables affecting ‘energy savings’
- How to identify significant vs less-significant variable?
- Cost vs Uncertainty Trade-off (How much to measure?)
- Risk & Reward Allocation between different parties
- **Need for a Standard M&V Protocol to address aforementioned issues**

# Current M&V Protocols

M&V is an **evolving art and science**, although common M&V practices for energy end users are documented in:

- IPMVP (most widely used)
- ASHRAE Guideline 14
- US DOE FEMP M&V Guide for US government buildings

*These 3 documents have many common authors, though they are written for slightly different purposes*

- California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals.

# EVO

## Efficiency Valuation Organization (EVO)

[www.evo-world.org](http://www.evo-world.org)

- The home of the IPMVP
- A non-profit U.S. corporation
- Led by volunteers around the world
- Administrative office in Sofia, Bulgaria.

# Promotion of M&V

- EVO recognises AEEE as its International Training partner for South Asia, West Asia & S.E Asia.
- Since 2009 conducts Certified M&V Professional (CMVP) training and examination
- AEEE trainings has certified 99 CMVP professionals in India (globally there are 2500 CMVPs)
- AEEE conducts IPMVP familiarization training in Philippines and Thailand

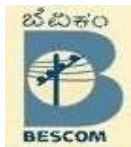
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