

# The Critical Connection between the M&V Contractor, Implementation Contractor and Program Manager

Larry Roe  
M&V Contractor



# Project Controls: Measurement & Verification

- We are committed to implement – Do we need feedback on the results?
- Association of Energy Engineers sponsors the International Performance Measurement and Verification Protocol (IPMVP) to provide feedback
- Choose who performs M&V:
  - No One
  - Project Manager
  - Implementation Contractor
  - M&V Contractor
  - Commission Contractor

# M&V Option Zero

- Advantages
  - Low Cost
  - No coordination required of the Project Manager
- Disadvantages
  - The impact of the ECM(s) may not be determined
  - Completion of energy savings is not quantified
- Common Occurrences
  - ECMs with accepted merit, e.g. Energy Education
  - Low cost projects

# Project Manager M&V

- Advantages
  - Low Cost, extension of project approval process
  - Easy coordination for the Project Manager
- Disadvantages
  - Data collection resources limited
- Common Occurrences
  - ECMs with accepted merit, e.g. CFLs
  - Low cost projects

# Implementation Contractor M&V

- Advantages
  - Costs can be included in project management
  - Easy coordination for the Project Manager
- Disadvantages
  - Data collection resources limited
- Common Occurrences
  - ECMs with accepted merit
  - Medium cost projects

# M&V Contractor

- Advantages
  - Third party assessment of ECM impact
- Disadvantages
  - Additional cost for ECM energy savings measurement
  - Requires coordination of two contractors
- Common Occurrences
  - High cost projects
  - Utility Management or Commission requirement

# Commission M&V

- Advantages
  - Third party assessment of ECM impact
- Disadvantages
  - Additional cost for ECM energy savings measurement
  - Data not always accessible to Project Manager
- Common Occurrences
  - California, New Mexico, etc.

# Contractor Roles

- ECM Marketing
- Customer Contacts
  - Repeat interactions with Project Manager Agents
- ECM installation
- ECM/M&V Data Collection
- Data communication
  - Baseline data
  - ECM data
- Savings Calculations
  - Ex ante savings
  - Post installation



# M&V Steps

- Identification of variables that affect ECM energy savings
  - ECM efficiency
  - Hours of Use (baseline vs. ECM0)
  - Seasonal effects
  - Sampling
- Collection of Baseline data
- Collection of ECM operational data
- Analysis of isolated ECM or the system in which the ECM is installed
- Determination of time-dependent energy use by the ECM or system

# M&V Details

- M&V Actions, in order of increasing cost and confidence
  - Verification of ECM installation, energy savings deemed (no measurement)
  - Analysis of utility meter data (billing analysis)
  - Measurement and verification of a subset of the ECMs. Application of a realization rate to the entire population
  - Calibrated simulation of the ECMs at a site
  - Measurement and verification of a sampling of ECM components at each site
  - Measurement of energy use of all ECMs

# Project Manager Planning Steps

- Define ECMs for all contractors
- Generate M&V plan before writing implementation contract – separate M&V plan from M&V execution
- Include necessary data (baseline and post-installation) in pay for performance contracts
- Choose the M&V option, including sampling plans
- Determine precision and confidence relative to sampling costs