The Certified Measurement & Verification Professional (CMVP®) Program

Presented by the Association of Energy Engineers (AEE), in conjunction with the Efficiency Valuation Organization (EVO), this comprehensive training course is designed to provide a useful preparatory vehicle for those seeking to achieve the status of Certified Measurement and Verification Professional (CMVP), awarded by AEE to pre-qualified M&V professionals who complete this seminar and successfully pass the CMVP examination administered by AEE at the close of instruction.

PROGRAM OF STUDY
Proven energy savings are now playing a significant role in financing energy management programs, whether through energy performance contracts or through emission trades under schemes such as the clean development mechanism of the UNFCCC. While interest in savings data is growing, the state of the art in determining savings has also been rapidly evolving. This seminar will examine current best practices for determining and documenting savings, specifically reviewing the current edition of the International Performance Measurement & Verification Protocol (IPMVP). Attendees will learn the process of designing a proper M&V program for their projects, including cost/accuracy tradeoffs, baseline adjustments, interactive effects, types of savings, maintaining transparency, and analysis methods. Examples of specific techniques will be presented, along with common pitfalls which can result in unreliable savings reports. These techniques are central to management under the new ISO 50001 standard for Energy Management Systems. Class time will include problem solving and debate. Bring a calculator and any M&V challenges you may currently face for general discussion. Through participating in a "fundamentals" course, persons experienced in M&V will also appreciate the assembly of all of the issues, the debates, and engagement at their own level with expert instructors.

REGISTRATION
Course schedules, language, venue, dates, cost, eligibility, contact for details and registration information are available at: www.aeecenter.org/internationalcertification/cmvp.
COURSE OUTLINE

REASONS FOR M&V
• Types of uses for M&V
• M&V’s role in financing

CURRENT M&V PROTOCOLS
• Relationship of IPMVP and other guidelines

IPMVP
• Its evolution
• Overview of IPMVP Options A, B, C & D

DEVELOPING AN M&V PLAN
• Principles of M&V
• Scope of energy to be monitored
• Differences between M&V for industry and for buildings
• "Cost avoidance" or "normalized savings?"
• Choosing independent variables for routine baseline adjustments
• Sources of data
• M&V budgets
• Selecting the baseline period and data
• Measurement systems design, commissioning & maintenance
• Baseline analysis methods
• Various forms of savings computation
• Valuing savings
• Routine procedures and QC
• Managing the uncertainty created by sampling, metering, modeling and unknowns
• Bias and rounding
• Reporting procedures
• Coordinating with other purposes
• When to do the M&V Plan

CURRENT ISSUES IN M&V
• Coping with missing data
• Cost/uncertainty tradeoffs
• Monitoring IAQ

BASELINE ADJUSTMENTS
• Why they are necessary
• Who does what, when

KEY ELEMENTS OF SUCCESS: THEORY & EXAMPLES OF IPMVP OPTIONS
• Details of IPMVP methods
• Retrofit isolation (IPMVP Options A & B): Instrumentation issues
• Whole facility (IPMVP Option C): Utility billing issues
• Calibrated simulation (IPVMP Option D): Simulation issues
• Lessons from tough experience

SELECTING OPTIONS: WHICH ONE IS BEST SUITED FOR MY PROJECT?

ADHERENCE WITH IPMVP

COURSE INSTRUCTOR

Steve Kromer

STEVE KROMER, P.E., is an energy efficiency consultant focusing on energy savings verification (program evaluation and M&V) and energy efficiency data management systems. He is treasurer of the Efficiency Valuation Organization (EVO) and current chair of the CMVP certification board. Formerly a senior engineer at the Lawrence Berkeley National Laboratory (where he is presently a guest researcher) and a director at Enron Energy Services, Mr. Kromer currently consults internationally on M&V implementation and training.