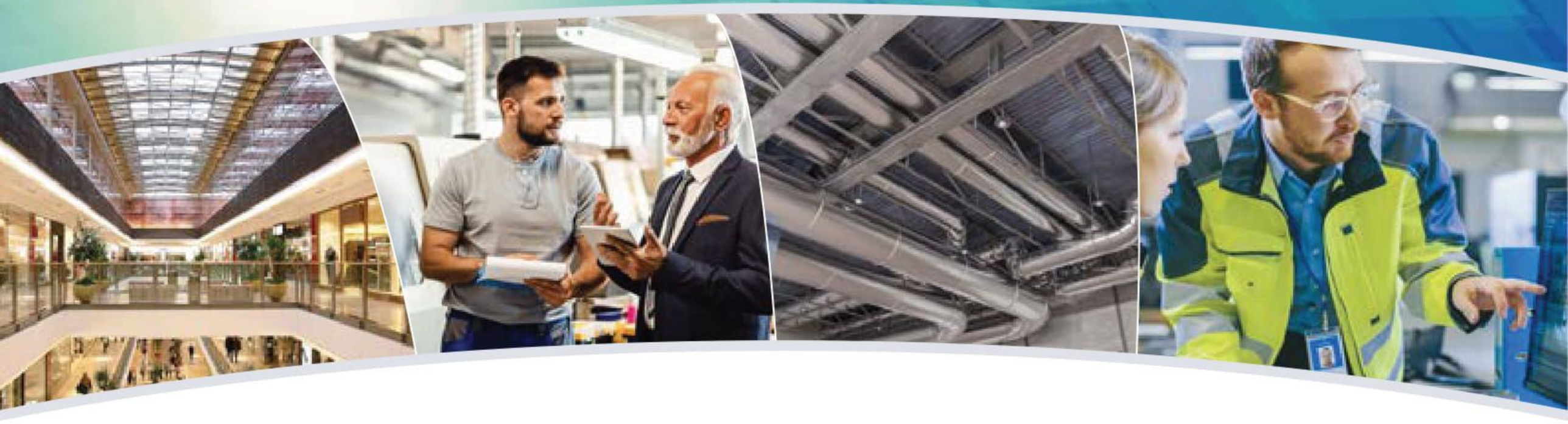
International Version
Sub-Sahara Africa

Association of Energy Engineers



Certified Measurement & Verification Professional® Training Program

A Certified Measurement & Verification Professional (CMVP®) is an individual who measures and verifies energy usage and energy requirements throughout a building or across multiple facilities. They develop metrics so that investment in energy, water, demand management, retrofit, and renewable energy projects can be evaluated, and prioritized. A CMVP® can often help a company realize substantial savings.

About this Program

This training program is designed to provide attendees an understanding of industry best practices for measurement and verification (M&V), including how to evaluate the performance of efficiency projects, and how to best apply the International Performance Measurement and Verification Protocol (IPMVP) standard. AEE's CMVP® program is presented in conjunction with the Efficiency Valuation Organization® (EVO®).

What You Will Learn

– Learn how to measure, verify and evaluate metrics for prioritizing investment in energy, water and demand management, and renewable energy projects.

– Learn how to apply the core M&V program concepts and framework to a wide variety of facilities, including existing and new buildings and industrial processes.

– Undertake a review of the IPMVP and learn essential concepts of IPMVP options A, B, C & D.

– Learn why the ISO 50001 standard for Energy Management Systems is critical for M&V professionals.

At-a-Glance

» This training program prepares attendees to take the Certified Measurement & Verification Professional® (CMVP®) exam.

» This program is held over 3 days, with a voluntary exam on day 4.

» You earn 1.8 CEU | 18 PDH | 3.6 AEE Credits for completing this program.

Key Takeaways

» Work through practical examples to demonstrate the topics and procedures covered.

» Review the various areas of the Body of Knowledge associated with AEE's certification exam.

» Discuss how to apply what you have learned to your business and applications.

» Leave with a course workbook and other tools that are invaluable in the field.

Represented in Sub-Sahara Africa by

INSTITUTE OF ENERGY PROFESSIONALS AFRICA NPC

CMVP®

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Certified Measurement & Verification Professional® Training Program

Who Should Attend

The program is of greatest value to those undertaking or assessing M&V energy projects. Obtaining AEE's CMVP® certification provides international credibility among energy management and M&V communities. Attendees of this program have included existing M&V professionals, energy engineers, energy managers, energy analysts, financial executives, manufacturing and facilities managers, and energy consultants.

Course Outline

- Measurement
- Short Examples and Best Applications
- M&V Planning
- Critical Issues
- M&V Calculations
- Retrofit Isolation Details
- IPMVP Options A and B
- IPMVP Option C (Whole Facility Performance Assessment)
- IPMVP Option D (Missing Baseline or Reporting Period Data)
- IPMVP Adherence: Core Concepts & Uncertainty Assessment
- Other M&V Applications
- Summary and Review of a Detailed M&V Plan

Mauritius Bookings:
Pamelah Gungaram
PMTCS
Email: pgungaram.pmtcs@myt.mu

Certification Eligibility

The prerequisites to qualify for the certification process take into account the diverse education and experience applicants may have. Each candidate must meet the required criteria at aeecenter.org/cmvp

CURRENT QUALIFICATION		EXPERIENCE
4-year engineering/architectural degree OR Pr.Eng, Registered Architect	PLUS	+3 years
4-year degree in technology, environmental science, physics or earth science		+3 years
3-year technical qualification		+5 years
4-year degree in business or business related		+5 years
4-year unrelated degree		+5 years
2-year associate degree		+5 years
NONE: no current qualification		+10 years
Current status of CEM		X
Current status of CBEP		n/a
Employment at company in related field		n/a
Years of work experience required - in addition to the current qualification - must be related to the certification discipline applied for.		

Certification, exams and quality control by:

iepa.org.za
info@iepa.org.za
+27 (0)84 622 4770

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Our Instructors

Over three days, one of our professional instructors will guide you through M&V, and the IPMVP. Their teaching and industry experience allows them to deliver information that is of the most relevance and practical value to attendees.

Christo van der Merwe

MSc Mechanical Eng, CMVP®, CEM®

Denis van Es

MSc Mechanical Eng, CMVP®

Daily Agenda

Day 1

Measurement
- Key Concepts and Terminology
- IPMVP's Savings Equation 1
- Adjustment of Savings
- Whole Facility Measurement vs. Retrofit Isolation Methods
- M&V Cost and Savings
- IPMVP Savings Equation 2 and Statistics
- Comparing Energy Performance to Building Codes

Short Examples & Best Applications
- Multiple ECM Building Retrofit
- New Building
- Lighting Efficiency Improvement
- Compressed Air Leakage Control

M&V Planning
- M&V Planning Theory and Details
- Fundamental Principles
- Setting Boundary of Measurement
- Types of Savings (Energy Cost Avoidance, Normalized Savings, Backcasting)
- Baseline Data and Independent Variables
- Adjacent Measurement Periods
- Measurement Equipment (Metering, Installation, Maintenance and Safety)
- Routine Reporting Procedures & Quality Control (ISO 9001)
- M&V Plan Template (IPMVP Core Concepts, Chapter 7)

Day 2

Critical Issues
- Missing Data During Reporting Period
- M&V Budget (Balancing Cost and Uncertainty)
- Baseline Adjustments (BLAs)
- BLA Squabble (Baseline Change)
- Utility Rates for M&V (Cost Savings Reports/Pricing Methods)
- Verification (Operational, Independent, and Retrofit Isolation Verification Methods)
- Adherence with IPMVP

M&V Calculations
- Language and Application of Statistics in M&V
- Sampling Methods
- Linear Regression Modelling and Tests
- Determining Uncertainty in Savings Estimates (Project Bankability)
- Rounding and Accuracy

Day 3

Retrofit Isolation Details
- A and B Method (Retrofit Isolation Options)
- Detailed Examples
- Summary of Issues

Option C Details (Whole Facility Performance Assessment)
- Option C Method Review
- Detailed Summary of Issues
- Software for Utility Bill Analysis

Option D Details (Missing Baseline or Reporting Period Data)
- Simulation and Method Overview
- Industrial Processes
- Simulation Quality Issues

Other M&V Applications
- Persistence of Energy Savings
- M&V in a Recommissioning Context (RCx)
- M&V Monitoring and Targeting (M&T)

Summary and Review of a Detailed M&V Plan
- Adherence with IPMVP
- Selecting and Option
- Preparing and M&V Plan