



# RE068: Advanced Measurement and Verification

## Training Description:

This comprehensive training course is designed to provide professionals with **in-depth knowledge** and **practical skills** for accurately measuring, verifying, and reporting energy savings and efficiency improvements in facilities and projects. As organizations pursue sustainability goals and energy efficiency programs, reliable M&V practices are essential to demonstrate performance, validate savings and ensure compliance with standards such as IPMVP.

This intensive training course covers advanced M&V methodologies, data collection, analysis, baseline modeling, uncertainty analysis, reporting protocols and verification techniques for complex projects. Participants will engage in practical exercises, case studies, simulations and project-based activities to gain hands-on experience in implementing M&V practices across commercial, industrial and utility-scale projects.

By the end of the training course, participants will be able to design and implement M&V plans, select appropriate methodologies, conduct detailed measurement and data analysis, verify savings claims and provide accurate reporting to stakeholders. The training enhances technical expertise, analytical skills and the ability to manage energy performance verification with confidence.

## Training Objectives:

**By the end of the training, participants will be able to:**

- ✓ Understand the principles and standards of Measurement and Verification (M&V)
- ✓ Design M&V plans for complex energy efficiency projects
- ✓ Select and apply the appropriate M&V methodology for each project
- ✓ Collect, validate and analyze energy data accurately
- ✓ Develop baseline models and forecast energy savings
- ✓ Conduct uncertainty and risk analysis in M&V
- ✓ Verify and quantify energy performance improvements
- ✓ Prepare clear and reliable M&V reports for stakeholders
- ✓ Apply M&V principles to comply with IPMVP and other industry standards

## Training Designed for:

This training is designed for energy managers, facility managers, sustainability officers, engineers, auditors, consultants, project managers, utility program managers and professionals responsible for monitoring, verifying and reporting energy efficiency projects. It is ideal for individuals seeking advanced knowledge in M&V techniques, energy savings verification, and compliance with industry standards.

## Training Requirement:

**"Hands on practical sessions, equipment and software will be applied during the course** if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

## Training Program:

### DAY ONE:

#### INTRODUCTION TO ADVANCED M&V

##### ❖ Fundamentals and Standards

- Overview of Advanced Measurement and Verification
- Principles of energy efficiency measurement and verification
- IPMVP and other relevant standards
- Roles and responsibilities in M&V projects
- **Case study:** Understanding successful M&V implementation

### DAY TWO:

#### M&V METHODOLOGIES AND PLANNING

##### ❖ Selecting the Right Approach

- Overview of M&V options and methodologies
- Detailed design of M&V plans
- Defining key performance indicators and metrics
- Scope, boundary and baseline determination
- **Workshop:** Developing an M&V plan for a sample project

### DAY THREE:

#### DATA COLLECTION AND ANALYSIS

##### ❖ Ensuring Accuracy and Reliability

- Data acquisition techniques for energy systems
- Sensor calibration, metering and monitoring technologies
- Validation and cleaning of energy data
- Statistical analysis and modeling of energy performance
- **Practical exercise:** Analyzing collected energy data

### DAY FOUR:

#### SAVINGS VERIFICATION AND UNCERTAINTY ANALYSIS

##### ❖ Quantifying Energy Performance

- Calculating and validating energy savings
- Handling measurement uncertainties and error
- Sensitivity analysis and risk assessment
- Adjusting baselines for operational changes
- **Case study:** Verification of savings in complex projects

### DAY FIVE:

#### REPORTING, COMMUNICATION AND CONTINUOUS IMPROVEMENT

##### ❖ Communicating Results Effectively

- Preparing professional M&V reports
- Presenting verified savings to stakeholders
- Lessons learned and continuous improvement strategies
- Integrating M&V into ongoing energy management programs
- **Final exercise:** Developing a full M&V report for a case study

##### ❖ Course Conclusion

## ❖ POST-ASSESSMENT and EVALUATION

### Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

### Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

### Training Fees:

**TBA as per the course location** - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01<sup>st</sup> of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

### Training Timings:

#### Daily Timings:

|               |                               |
|---------------|-------------------------------|
| 07:45 - 08:00 | Morning Coffee / Tea          |
| 08:00 - 10:00 | First Session                 |
| 10:00 - 10:20 | Recess (Coffee/Tea/Snacks)    |
| 10:20 - 12:20 | Second Session                |
| 12:20 - 13:00 | Recess (Prayer Break & Lunch) |
| 13:00 - 14:00 | Last Session                  |

#### For training registrations or in-house enquiries, please contact:

**Aisha Relativo** - Training & Career Development Manager

[aisha@cmc-me.com](mailto:aisha@cmc-me.com) / [training@cmc-me.com](mailto:training@cmc-me.com)

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615