



Certified Energy Manager® Training Program

A Certified Energy Manager (CEM®) is an individual who optimizes the energy performance of a facility, building, or industrial plant. The CEM is a systems integrator for electrical, mechanical, process, and building infrastructure, analyzing the optimum solutions to reduce energy consumption using a cost-effective approach. CEM's are often team leaders and help to develop and implement their organizations' energy management strategies.

About this Program

AEE's premium training program is recognized across industry for providing energy professionals a holistic "big-picture" view of energy management for non-residential buildings and facilities. Over five days, attendees learn everything they need to know to optimize systems to help reduce costs, improve profits, and increase occupant satisfaction.

What You Will Learn

- Learn energy management from a global perspective, but also understand applicable codes, standards, and policies for your region or country.
- Learn how systems and energy-saving technologies can be used throughout a building, such as HVAC, lighting, motors, boilers, energy storage, CHP, etc.
- Learn how energy management strategies and practices, such as energy audits, or M&V, can help identify energy savings and reduce costs.
- Understand the economic aspects of energy management that you need to know for procurement, supply, and project financing.

At-a-Glance

- » This training program prepares attendees to take the Certified Energy Manager® (CEM®) exam.
- » This program is held over 5 days.
- » You earn 3.3 CEU | 33 PDH | 6.6 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 one-on-one with an instructor how to apply what you have learned to your business and applications to improve profitability.
- » Leave with a course workbook that will become an invaluable desk reference.

Registration

Candidates should contact their local AEE approved training provider for information about available training programs, the certification application process, exam registration, and associated fees. To find your local training provider visit

aeecenter.org/training

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Who Should Attend?

This course is designed to help energy professionals, including energy managers, energy engineers, facility and business managers, industrial engineers, supply chain professionals, utility officials, consultants, contractors, financial officers, and energy service company professionals become more aware of and effective at identifying and implementing the best energy management strategies. This mix of energy professionals and the learning environment also provides attendees an excellent opportunity for peer-to-peer learning and networking.

Course Outline

- Why Energy Management is Important
- Energy Basics
- Fuel Supply and Pricing
- Energy Audits and Instrumentation
- Codes and Standards
- High Performance Green Buildings
- Energy Accounting and Economics
- Electrical Power Systems
- Motors and Drives
- Lighting Systems
- Maintenance and Commissioning
- HVAC Systems
- Building Envelope
- Building Automation and Control Systems
- Thermal Energy Storage Systems
- Boiler and Steam Systems
- CHP Systems and Renewable Energy
- Industrial Systems
- Energy Savings Performance Contracting
- Energy Savings Measurement and Verification

Our Instructors

The CEM multi-day program is taught by approved instructors with extensive experience in the industry. They present the latest practices, strategies, and theories, while leading discussions in an open, interactive environment. You also spend invaluable time connecting with and learning from, other program attendees. In each topic covered, the instructors focus on the most “useful” and “proven” activities that an energy manager should pursue to improve profits.

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/cem

Global Training Programs

For a complete list of AEE training programs delivered globally visit

education.aeecenter.org/global

Accreditation and Recognition

The Certified Energy Manager (CEM®) accreditation is one of the most globally respected in the field of energy management. Since 1985, professionals from over 100 countries have participated in AEE's approved CEM® training programs. For a full list of organizations that have recognized or accredited the CEM® program visit

aeecenter.org/cem

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Daily Agenda

Day 1

Why Energy Management is Important, become aware of:

- Global trends on Energy, Economy and Our Environment
- Non-Technical Drivers that Create the Need for Energy Projects
- Selling Points for Energy Projects

Energy Basics

- Energy Fundamentals
- Energy Conversion Factors and Application
- Comparing Energy vs. Power

Fuel Supply and Pricing

- Overview of Utility Rate Components
- Electric and Natural Gas Energy Procurement
- DSM and Demand Response
- Benchmarking Energy Information

Energy Audits and Instrumentation

- Energy Programs (ISO 50001, DOE and EPA Resources)
- Audit Strategies/Approaches
- Benchmarking, Level I, II, and III Audits (ASHRAE Standard 211-2018)
- Investment Grade Audits
- Reports
- Data Collection Technologies and Instruments Related to Energy Systems
- Data logging and Communication Technologies

Codes and Standards

- Scope of Relevant ASHRAE Standards (55.1, 90.1, 135, 189, 62.1)
- How ASHRAE Standards Affect Green Energy and Federal Building Energy Codes
- Ability to Estimate Minimum Air Flow Requirements (Ventilation Rate Procedure)

High Performance Green Buildings

- Leadership for Energy and Environment Design (LEED) Program and Benefits
- Energy Star Program and Benefits

Day 2

Energy Accounting and Economics

- Economic Analysis and Terminology
- Time Value of Money (TVM) Tables/Compound Interest Factors
- Calculate Key Financial Metrics: Net Present Value, PV, Life Cycle Cost, IRR, SIR and Simple Payback

Electrical Power Systems

- Electrical Basics (DC/AC, Single and 3-Phase Power)
- Resistive and Inductive Loads, Power Factor
- Voltage Imbalance, Grounding and Harmonics
- Estimating Savings from Power Factor Improvement
- Important 3-phase Motor Equations and Estimating Power Consumption

Motors and Drives

- Savings Considerations: Lifecycle vs. First Cost for Installing Energy Efficient Motors/VSDs
- Motor Terminology and Performance Factors
- Load Factors and Ability to Estimate Motor Loads
- Centrifugal Devices: Fan/Affinity Laws
- Variable Volume Options and Frequency Drives (VFD)

Lighting Systems

- Lighting Retrofits: Evaluate and Identify Opportunities for High Energy Saving Potential
- Lighting Design Basics and Terminology
- How to Avoid Common Mistakes of Lighting Retrofits
- Practical Approaches to Audits and Upgrades

Maintenance and Commissioning

- Useful Maintenance Technologies
- Basic Terminology and Common Maintenance Strategies
- Estimating Savings from Maintenance Activities (Compressed Air and Steam Leaks, Uninsulated Steam Lines, Group Relamping)

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Daily Agenda Continued

Day 3

HVAC Systems

- Types and Functions of HVAC Systems
- Vapor Compression Cycle, COP, EER, SEER, IPLV
- HVAC Energy Efficiency Measures
- Distribution Systems
- Psychrometric Chart and Processes
- Sensible and Latent Heat Transfer Calculations

Building Envelope

- Conduction, Convection, Radiation, and Infiltration
- Conductivity, Conductance, and R Values
- Sources of Building Heat Gain/Loss (Solar Heat Gain Coefficient)
- Ability to Perform Seasonal Energy Consumption Calculations
- Degree Day Formula Use

Building Automation and Control Systems

- Optimization and Safety for Various Energy-Related Systems
- PID Algorithms
- Basic Control Terminology
- Automation Systems Interoperability and IoT
- Current Technologies and Hardware and Energy Savings Strategies

Thermal Energy Storage Systems

- TES Terminology and Basic Designs
- Storage/Peak Shaving Strategies
- Storage Media Options
- Calculating Approximate Savings and Storage Size

Day 4

Boiler and Steam Systems

- Water Tube, Fire Tube, and Condensing Boilers
- Saturated and Superheated Steam
- Estimate Combustion Efficiency
- Calculate Heat Flows and Enthalpy Values using Steam Tables
- Energy Savings: Blowdown Heat Recovery, Flash Steam Utilization, Economizers, and Air Preheating

CHP Systems and Renewable Energy (Combined Heat and Power)

- Benefits of CPH Systems
- Calculating Basic Fuel Equation for CHP Systems
- Comparing CHP Fuel and Operating Costs vs. Utilities
- Comparing types of Renewable Energy and Storage Technologies

Industrial Systems

- Savings Estimates for Pumps, Compressed Air Systems and Waste Heat Recovery
- Pumps: Pump Curves and System Optimization Approaches
- Identifying Energy Waste Streams within Industrial Facilities

Energy Savings Performance Contracting and Measurement and Verification

- Financing/Performance Contracting (Cost of Delay vs. Financing Cost)
- 3rd Party Financing Options
- Performance Contracting Benefits vs. Risks
- EVO IPMVP Guidelines and Measurement Methods
- M&V Terminology, Check Ups, and Determining Best Approach for an ECM

Day 5

Open Q&A

Certification Exam

Preparatory Courses and Certification Examinations for the Certified Energy Manager

Location in India (<https://www.aeecenter.org/certifications/certifications/certified-energy-manager>) Organized by AEE Kolkata Chapter, IISWBM

REGISTRATION

Updates on Course schedules, eligibility, fees, contact for details and registration information are available at: www.iiswbm.edu and www.aeecenter.org/internationalcertification/CEM. Before submitting fees, you are advised to check your eligibility and availability of seat by submitting the filled-up application form available at following link for enrolment:

<https://forms.gle/VLmTyxhHjibuxbXMF8>

INDICATIVE INFORMATION: DATES, FEES and PROCEDURE

If those who are eligible, in terms of educational qualification, to take the exam but do not meet the experience requirement, on the date of application for CEM, receive a passing score, they can still earn the Energy Manager In Training (EMIT) certification. Then they have up to six years to gain the number of years of experience needed based on their education level (see eligibility requirements for CEM & EMIT).

Email your queries to aeecourseswithiiswbm@gmail.com / kmaiiiswbm@gmail.com and/or WhatsApp/SMS +91 9433719779/9123395598.

Last date of submission of filled-up application form along with fees	December 22, 2023
Confirmation of Registration for CEM Training and/or CEM Exam along with invitation for Scheduling CEM exam through ProctorU to Eligible Candidates	January 5, 2024
Conduction of online CEM International training & Practice Session by IISWBM	January 15-18 & 25, 2024
Conduction of online examination by AEE (Through ProctorU)	January 25 – February 13, 2024
Declaration of CEM Examination Result	March 13, 2024

SI CEM Study Guide available at <https://www.aeecenter.org/certifications/resources/cecm-resources>

Many other sources useful to prepare for CEM are also available in the said link. AEE Book also may be available at cost with the AEE Chapter.

Prior to sitting for the exam, each candidate must complete an application.

#CEM Training would be optional for the following candidates:





- Candidate possessing CEA or CEM certification from Bureau of Energy Efficiency (BEE), Government of India
- Candidate completed MBA-PS degree OR Master in Public Systems Management (MPSM) with specialization in Energy Management OR Post-Graduate Diploma in Energy Management (Approved by AICTE) from IISWBM-University of Calcutta.

The CEM exam will be administered during the scheduled Online Exam Window through ProctorU to those, with requisite experience and degree from an (AICTE/UGC/AIU/Such Body) accredited university or college, who has qualified in advance to sit for the exam by submitting a completed CEM application and fee.

Fees for the Training Seminar (in INR)*	50000
Fees for the Examination (in INR)*	40000

*Add GST 18%. Discount of up to 5% applicable to active AEE members recommended by the applicant's AEE Chapter President/Vice-President

COURSE INSTRUCTORS FOR AEE CEM INTERNATIONAL

	Dr. Binoy K Choudhury, B.E., CEA & CEM (AEE, USA) Trainer, A.E.A.(BEE, Govt. of India) is Professor in Energy Management, IISWBM and Guest Faculty member at IEST and Kalyani University. Earned experience/training in Germany, Japan, United Nations, Thailand, UK, &USA. About 30 years of experience in Energy Field (academics and industry). Email: bkchoudhury@iiswbm.edu		Mr. Som Derashri, BE (Chem)-BITS, Pilani & PG in Industrial Engg. CEM (AEE, USA) Trainer, A.E.A.(BEE, Govt. of India), Certified Lead Auditor for ISO 50001 (BSI, UK), CMVP (AEE & EVO, USA), Over 25 years of industrial experience & completed over 500 Energy Audits in India & Abroad. Launched many innovative energy saving products. Email: som_derashri@rediffmail.com
	Mr. Vinay Gadikaris an accomplished energy professional working in the field of energy efficiency and renewable energy for more than 10 years. He is CEM (AEE, USA) Trainer; CEA (BEE, Govt. of India); Lead Auditor for EnMS ISO 50001 (IRCA). He has worked in Process Industries, DCs, Commercial Establishments. Email: vinaygenergy@gmail.com		Mr. Benet George V is an internationally experienced energy professional and done hundreds of energy audits, related projects and training in 11 countries. His certifications include CEM (AEE, USA) Trainer, CMVP (AEE & EVO, USA), PMP (PMI, USA), AEA (BEE, Govt. of India), ISO 50001 Lead Auditor and ZED Assessor. Email: benet.george@gmail.com
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The Director of IISWBM & President of AEE Kolkata Chapter : Mr Dipankar Dasgupta (Email: ddg_director@iiswbm.edu); The Presidents of the supporting AEE Chapters are: Mr Dalip Singh, AEE Delhi Chapter (Email: dschahar@gmail.com) and Mr Milind Rajendra Chittawar, AEE Western India Chapter (Email: milind.chittawar@seetechnsolutions.in)			

Submission of Application: For enrolment apply through link <https://forms.gle/VLmTyxhHjibuxbXMF8> or Emails your credentials to aeecourseswithiiswbm@gmail.com / kmaiiiswbm@gmail.com within stipulated date with Name(s), Qualifications & Experience (enclose supporting document), Address for Communications (with mobile number and Email) and other information as per Application Format with PP size Photo, and proof of online payment made by the stipulated date. Please note the Bank details for NEFT/RTGS Transfer: Beneficiary: IISWBM, Name of Bank: State Bank of India, Surya Sen Street Branch, Kolkata, ACCOUNT NO.: 10252384198, IFS Code: SBIN 0003496; SWIFT Code: SBININBB492, MICR Code: 700002099 and PAN : AAAT13215M, IISWBM'S GSTIN # 19AAAT13215M2ZJ and accounting head 9992 for 18 % GST.

Rise to the Top of the Energy Management Profession: Become AEE Certified