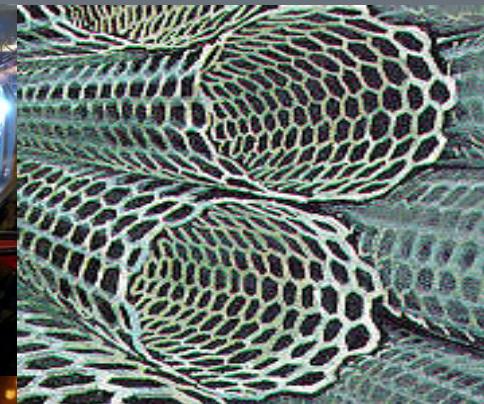


Becoming a Certified Practitioner or a Certified Energy Engineer



John Smegal

*Workforce Development Lead
Advanced Manufacturing Office*

U.S. Department of Energy

- Define the scope of our discussion
 - Certified Practitioner (CP) and Certified Energy Manager (CEM) credentialing
 - Will not discuss the Superior Energy Performance program in depth
 - Provide Association of Energy Engineers an opportunity to discuss the CEM credential

- CP EnMS, Lead Auditor, Performance Verifier
 - Required for program launch
- No developments yet on CP systems
 - On-going budget constraints have limited progress in this area

- AMO selected two Professional Training Organizations (PTOs):
 - UL DQS, Inc.
 - Georgia Tech Research Corporation
- CP in Energy Management Systems (EnMS) training is nearing completion
 - Final beta test to be held during the World Energy Engineering Congress in Atlanta (Oct 2012)
 - Initial beta test of Performance Verifier training begins October 9, 2012
 - Initial beta test of online Lead Auditor course also released in October

Superior Energy Performance^{cm} Program

Certified Practitioner in Energy Management Systems

Institute for Energy Management Professionals



Aimee McKane

Lawrence Berkeley National Laboratory

Rachel Howenstine

IEnMP

Tuesday Webcast for Industry
September 11, 2012

Value of Energy Management

- Time and again, industrial energy efficiency has been demonstrated to be *cost effective* while having a positive effect on productivity
- Despite this, energy efficiency improvements with very favorable payback periods often *do not get implemented*
- Even projects that are implemented may *not be sustained* due to lack of supportive operational and maintenance practices

Problem: *Energy efficiency is not integrated into daily management practices.*

Solution: *Staff at all levels within an organization need to be engaged in the management of energy on an ongoing basis.*

Energy management requires an organization to shift from a project-by-project approach to one of continual improvement in energy performance

ISO 50001 - Energy Management System Standard

ISO 50001- Energy Management System Standard establishes a framework for industrial and commercial facilities and organizations to manage energy.



International Organization for Standardization

Potential impacts:

- Could influence up to 60% of the world's energy use across many economic sectors

Uptake of ISO 50001 will be driven by companies seeking an internationally recognized response to:

- Corporate sustainability programs
- Energy cost reduction initiatives
- Demand created along the manufacturing supply chain
- Future national cap and trade programs; carbon or energy taxes; increasing market value of “green manufacturing” / reduced carbon footprint
- International climate agreements

Status of ISO 50001

- Developed by ISO Project Committee 242; United States and Brazil lead effort with United Kingdom and China
- 48 countries involved in development (now 64)
- Published June 15, 2011
- ISO PC 242 transitioned to TC 242, developing standards and guidance related to implementation of ISO 50001

ISO 50001 Impacts

- ***Shifts the energy efficiency focus*** from individual projects to a systematic, data-driven management approach
- ***Requires top management to be engaged*** on an ongoing basis.
- ***Provides a context for informed decisions*** concerning proposed energy efficiency projects, including new technologies.
- ***Increases reliability of outcomes*** through emphasis on business processes rather than reliance on a few individuals
- ***Involves energy users and decision makers***, not just facility personnel and physical systems, to ***sustain the change***.

Scope of energy management



Superior Energy Performance Strategy

- Foster a corporate culture of **continual improvement** in energy efficiency
- Use **ISO 50001** standard as foundational tool for energy management
- Establish a **tiered program** that provides an entry point for companies at all levels of experience with energy management
- Create a **verified record** of energy performance improvement.
- Potentially **create value** for corporate energy savings and carbon reductions in utility, state, regional, national, and international trading markets



Superior Energy Performance Certification

Certification Requirements:

An ANSI/ANAB-accredited Verification Body will conduct a third-party audit to verify that the following requirements are met:

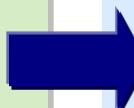
1. Energy Management System conformance to ISO 50001 Energy Management System Standard.
2. Energy performance improvement, as specified by pathway and sector



ISO 50001 is a foundational tool that any organization can use to manage energy.

ISO 50001
Components in place:

- Baseline
- Policy
- Plan
- Team/Leader



Superior Energy Performance

Single facility ISO 50001 conformance with validated energy performance improvement

ISO 50001



Texas Pilot Project, 2008-2010

DOE worked with the **University of Texas at Austin** to pilot Superior Energy Performance in Texas facilities:

- Field tested elements of Superior Energy Performance
- Implemented energy management systems using ANSI MSE 2000:2008, which is consistent with ISO 50001
- Conducted audits and tested SEP measurement and verification
- Established the first ANSI/ANAB-accredited Verification Body for Superior Energy Performance
- **Certified the first plants to Superior Energy Performance**



First Facilities Certified to Superior Energy Performance	% Energy Performance Improvement
Cook Composites and Polymers Houston, TX	14.9
Freescale Semiconductor, Inc. West Austin, TX	6.5
Owens Corning Waxahachie, TX	9.6
Dow Chemical Company Texas City, TX (manufacturing facility)	17.1
Dow Chemical Company Texas City, TX (energy systems facility)	8.1

Superior Energy Performance Demonstrations

U.S. DOE is conducting Superior Energy Performance (SEP) Demonstrations with several companies to implement energy management systems and improve their energy performance.

Improvements in energy performance are verified using the SEP Measurement and Verification Protocol.



Industrial Participants:

- | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• 3M• Alcoa• Allsteel• Amcor PET• Ascend Performance Materials• Bentley Prince Street• Bridgestone Tire• Coca-Cola | <ul style="list-style-type: none">• Cook Composites & Polymers• Cooper Tire• Cummins• Didion Milling, Inc• Dixie Chemical• Dow Chemical• Eaton• General Dynamics• Harbec Inc. | <ul style="list-style-type: none">• Haynes International• Holcim• Ingersoll Rand• JR Simplot• Kenworth Trucks• Lockheed Martin• MedImmune• Neenah Foundry Company• Nissan | <ul style="list-style-type: none">• OLAM Spices• Republic Conduit• Schneider Electric• Spirax Sarco• Traco• UTC/Sikorsky• United States Mint• Volvo• World Kitchen |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Certified Practitioners

Training and skill are required for appropriate application of ISO 50001 and verification of conformance and resulting energy performance improvement. Superior Energy Performance will help to build this workforce.

- **Certified Practitioners in Energy Management Systems (CP EnMS):**

Help facilities implement ISO 50001 and prepare for SEP certification

- **Certified Practitioner in Systems:**

Four planned- perform compressed air, process heating, pumping, or steam system assessments using ASME system assessment standards to identify energy performance opportunities

- **SEP Lead Auditors and SEP Performance Verifiers:**

Perform third-party audits to verify that a facility meets Superior Energy Performance requirements

- Oct 29 – Nov 2: Next class & exam for Certified Practitioners in Energy Management Systems
- <http://www.iemmp.com/training.asp>

http://www.superiorenergyperformance.net/certified_practitioners.html

SEP Verification Bodies & Certified Personnel

Verification Bodies will be accredited by ANSI/ANAB, based on requirements of the (ANSI) MSE 50028 standard (Nov. 2012)

**ANSI MSE
50028**
(Requirements for
Verification Bodies)

ANSI/ANAB Accreditation includes:

- Off-site review of the VB candidate's documented management system
- Observations of the candidate's audit team
- Assessment of the recordkeeping and competence of candidate's office personnel
- Annual verification of continued conformance

All SEP credentials must meet **ANSI/ISO/IEC 17024 accredited certification requirements**, including education, experience, and standardized exam

Accredited Verification Bodies, under agreement w/ the SEP Program Administrator, will contract w/ Applicants to conduct SEP audits using *Certified SEP Lead Auditors and Performance Verifiers*.

**Verification
Bodies**
(governed by (ANSI) MSE
50028 requirements)

Certified SEP Audit Team

**SEP Performance
Verifier**

SEP Lead Auditor

Can be one cross-qualified person

CP EnMS certification is required prerequisite + additional exam and qualifications

CP EnMS & ISO 50001 Auditor certifications are required prerequisites + additional exam and qualifications

**Certified Practitioner
in Energy Management
Systems (CP EnMS)**

**Certified ISO 50001
Auditor
(US National Exam)**

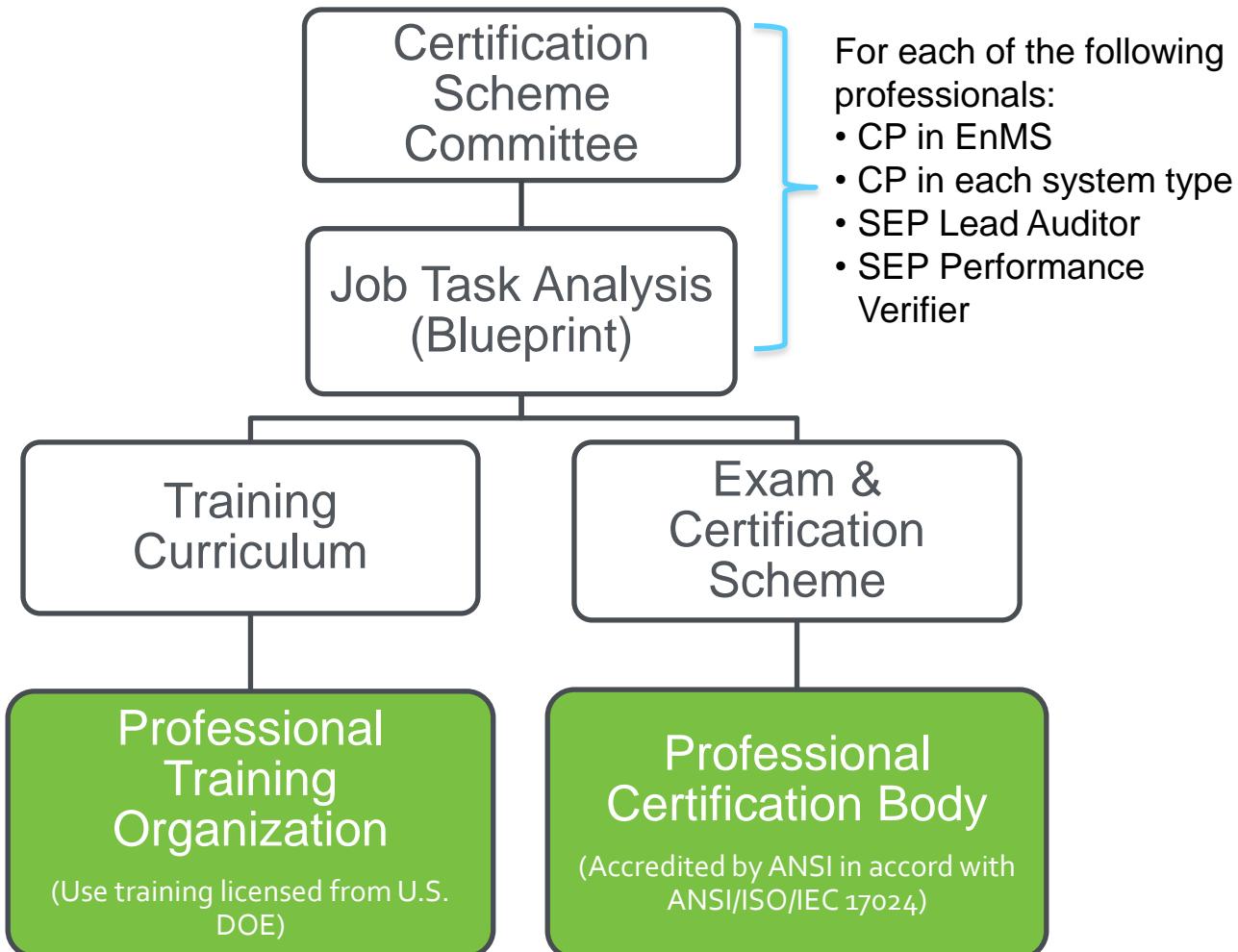
Professional Certification Framework

Form committees of experts for each type of professional

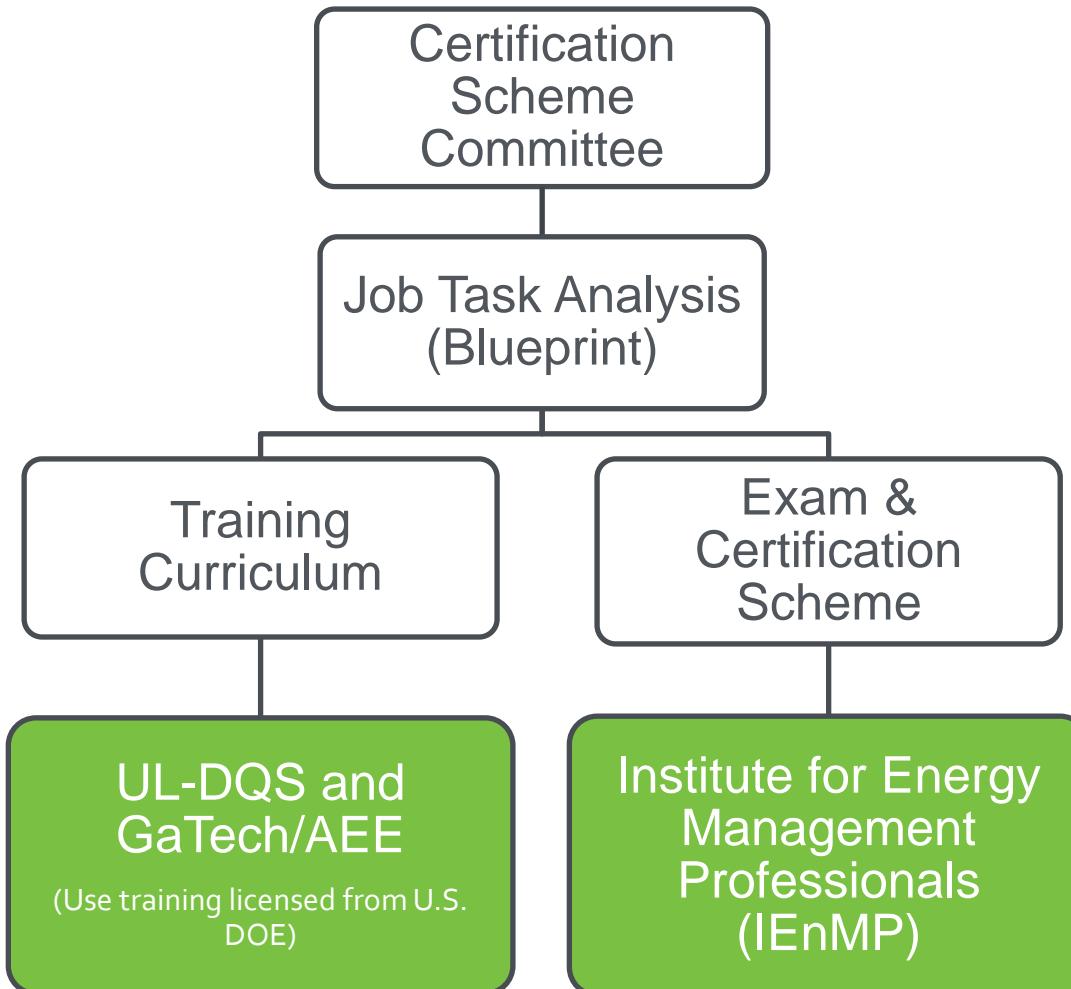
Define list of required knowledge and performance topics (skill set), to be reviewed by another group of experts

Develop training and exam based on Job Task Analysis (JTA) Blueprint

Training and exams administered through selected organizations



Certified Practitioner in Energy Management Systems (CP EnMS)



What is IEnMP?

- ANSI/ISO/IEC 17024 pending certification body
- Provides certifications to individuals in support of the Superior Energy Performance (SEP) initiative
- Incubated through GaTech Research Corporation
 - Non-profit organization
 - Funded by the Department of Energy
 - Separate from GaTech training
- Governed by a board of stakeholders
 - Utilities
 - Federal Government
 - End Users
 - Universities
 - National Laboratories

What Certifications does IEnMP offer?

- Certifications currently offered by IEnMP:
 - Certified Practitioner in Energy Management Systems – Industrial sector (CP EnMS – Industrial)
 - 43 people currently certified to CP EnMS - Industrial
- Future certifications to be offered by IEnMP
 - Certified Practitioner in Energy Management Systems – Commercial sector (CP EnMS – Commercial)
 - SEP Performance Verifier
 - SEP Lead Auditor

CP EnMS Certification Requirements

1. Fill out the Education and Experience form and submit to support@ienmp.com
 - Form requires you to submit a resume
 - Must be approved by IEnMP's Application Review Committee
2. Submit verification information
 - Verification form signed by supervisor
 - Transcript from school if necessary
3. Pass both exams (Core and Sector)

CP EnMS Eligibility Requirements

Path	Academic Credentials	Combined Energy Management and/or ISO MS Experience
1	P.E., CEM, IAC Certificate with four-year engineering degree.	3 years
2	Four-year degree in energy management, engineering, architecture, science or math	4 years
3	Four-year degree	5 years
4	None	6 years

Exam Details

- Core exam administered in the morning
 - 4 hours allotted
- Lunch break
- Sector specific- exam administered in the afternoon
 - 2.5 hours allotted

Why should I become a CP EnMS?

- Competitive Advantage: you are certified to provide technical assistance to organizations seeking to:
 - Develop an EnMS
 - Meet the requirements of ISO 50001
 - Meet the requirements of Superior Energy Performance
- CP EnMS is a new professional credential that
 - Has global relevance and acceptance through ANSI accreditation
 - Demonstrates competence in ISO 50001 and EnMS
 - Provides a prerequisite for other SEP qualifications
 - Will be publicized by through website listings and announcements by:
 - IEnMP
 - US DOE
 - Superior Energy Performance

CP EnMS Recertification

- Initial certification is valid for 3 years
- Demonstrate continual improvement
 - Continuing education course requirements through an approved institution
 - Document continuing work experience in energy management system implementation assistance

Future CP EnMS – Industrial Exam Dates

Dates	Locations
Nov. 2, 2012	Georgia Tech Global Learning Center, Atlanta, GA
Feb. 21, 2013	Georgia Tech Global Learning Center, Atlanta, GA
Mar. 7, 2013	GlobalICON, Philadelphia, PA
May 16, 2013	Georgia Tech Global Learning Center, Atlanta, GA
Jun. 20, 2013	Energy Management Congress, Las Vegas, NV
Sept. 12, 2013	World Energy Engineering Congress, Washington, DC
Nov. 7, 2013	Georgia Tech Global Learning Center, Atlanta, GA

<http://www.iemmp.com/training.asp>

Additional Certifications Offered

- IEnMP is in process of developing 2 additional certifications:
 - SEP Performance Verifier: assess an organization's conformance to the (1) measurement and verification protocols and (2) energy performance improvement levels defined by the SEP program.
 - SEP Lead Auditor: assess an organization's management system conformance to ISO 50001 and additional SEP requirements documented in ANSI/MSE 50021.
- CP EnMS is expanding to
 - Commercial sector available mid-2013
 - Additional sectors in response to market demand

Questions???

Contact Details:

Rachel Howenstine
Operations Manager
IEnMP

312.242.3016

support@ienmp.com
www.ienmp.com

How to Become a CP EnMS

**Angela H. Gilleland
Instructional Technology Specialist
Georgia Institute of Technology**

Who are CP EnMS?

- ❖ Facility personnel
- ❖ Consulting professionals
- ❖ Service professionals with appropriate technical experience

Professional Training Organizations for CP EnMS

❖ Georgia Tech and AEE

❖ UL-DQS

Documents

- ❖ ISO 50001
- ❖ ANSI/MSE 50021
- ❖ SEP Protocol
- ❖ SEP M&V Protocol for Industry
- ❖ SEP Industrial Facilities Best Practices Scorecard

CP EnMS Training

Consists of:

- ❖ Online pre-courses
- ❖ Face-to-face training

CP EnMS Online Pre-Courses

❖ Introduction to ISO 50001

❖ Introduction to Superior Energy Performance

❖ Case Study

CP EnMS Face-to-face Training

Day 1:

- ❖ Introduction to CP EnMS
- ❖ Energy Review
 - ❖ Energy Analysis
 - ❖ Opportunities
 - ❖ Significant Energy Uses
 - ❖ Relevant Variables

CP EnMS Face-to-face Training

(cont.)

Day 2:

- ❖ EnPI, Baselines and Energy Performance
- ❖ Objectives, Targets and Action Plans
- ❖ M&V Protocol

CP EnMS Face-to-face Training

(cont.)

Day 3:

- ❖ Procurement & Design
- ❖ Operational Control
- ❖ Monitoring, Measuring & Analysis

CP EnMS Face-to-face Training

(cont.)

Day 4:

- ❖ Best Practices Scorecard
- ❖ Internal Audit Program
- ❖ Energy Performance
- ❖ Corrective & Preventive Action

CP EnMS Training BUILDS on Prior Knowledge

- ❖ No specific pre-requisite requirements for training
- ❖ Prior knowledge needed
- ❖ Supplemental courses available

More Information About CP EnMS

- * U.S. Department of Energy – Superior Energy Performance
http://www.superiorenergyperformance.net/certified_practitioners.html
- * Association of Energy Engineers
https://www.aeeprograms.com/store/detail.cfm?id=1109&category_id=4
- * Angie.Gilleland@innovate.gatech.edu

How to Become a CEM

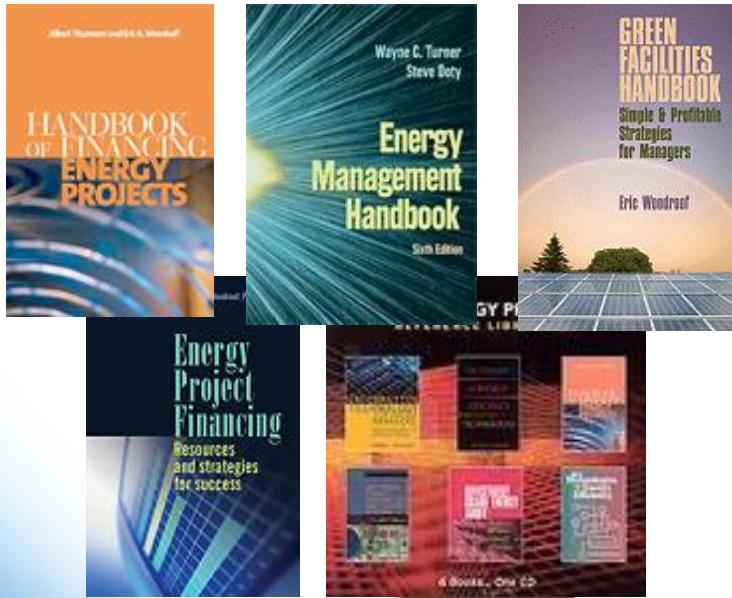


Eric Woodroof, Ph.D. 888-
563-7221

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Certified Energy Manager

AEE[®]
The Association of Energy Engineers

Who is this Guy?



Eric Woodroof, Ph.D.

“Woody”

2011 President of AEE
Board Member for CEM & CRM



The Association of Energy Engineers



Who is AEE?

Nonprofit organization;
16,000 members in 89 countries;

Information source for dynamic fields of:

Energy efficiency

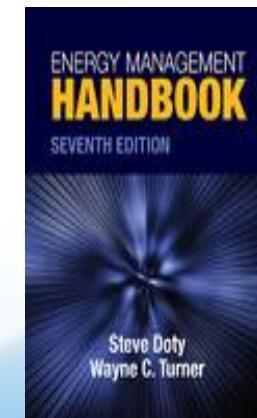
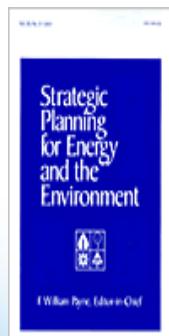
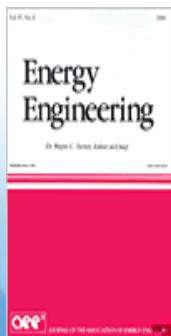
Energy auditing

Utility deregulation

Facility management

Plant engineering

Environmental compliance



CEM®
Certified Energy Manager

AEE®

The Association of Energy Engineers

An Unmatched Credential...

AEE certification programs are recognized by various departments of the U.S. Government, Fortune 1000 companies, utilities, energy service companies, and countless others.



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aee[®]

The Association of Energy Engineers

Join Your Peers...

There are over 13,000 active CEMs and over 22,000 AEE Certified professionals in other specialty energy areas.

CEM represents a “Who’s Who” in energy management.



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Distinguish Yourself...

Professionals seeking the CEM designation must meet a board-approved list of pre-qualifications in experience in the field and prior educational achievements.



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The Association of Energy Engineers

Certification Reqs.

- Degree + 3 Years Exp.
 - Alternatives...
 - EMIT
- Pass the CEM Exam
- Approved by Board

CEM®
Certified Energy Manager

	Content/Questions Percent	
	Min	Max
CODES AND STANDARDS	4%	6%
ENERGY ACCOUNTING AND ECONOMICS	11%	14%
ENERGY AUDITS AND INSTRUMENTATION	11%	15%
ELECTRICAL SYSTEMS	5%	7%
HVAC SYSTEMS	5%	7%
MOTORS AND DRIVES	5%	6%
INDUSTRIAL SYSTEMS	4%	6%
BUILDING ENVELOPE	4%	5%
CHP SYSTEMS and RENEWABLE ENERGY	4%	5%
FUEL SUPPLY AND PRICING	4%	5%
BUILDING AUTOMATION AND CONTROL SYSTEMS	4%	6%
HIGH PERFORMANCE BUILDINGS	4%	5%
THERMAL ENERGY STORAGE SYSTEMS	3%	4%
LIGHTING SYSTEMS	5%	7%
BOILER AND STEAM SYSTEMS	4%	6%
MAINTENANCE AND COMMISSIONING	4%	6%
ENERGY SAVINGS PERFORMANCE CONTRACTING and MEASUREMENT AND VERIFICATION	4%	5%

CEM Training

Offered via:

- **Live Seminars (all over world)**
- **Online Seminars**
- **Local Chapters**

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Increase Your Opportunities...

With fierce competition throughout the energy industry, professionals might be astounded to know how many employers already require CEM certification as a condition for hiring.

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Leading the Way...

Since 1981, AEE's flagship certification program has emphasized the technical aspects of what energy managers in government and the private sector need to know.

CEM[®]
Certified Energy Manager



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The Association of Energy Engineers

The AEE Foundation

- Provides undergraduate scholarships
 - Has awarded nearly \$1/2 million to over 1,000 outstanding students
 - 35th Annual World Energy Engineering Congress:
 - www.energycongress.com





MEMBER LOG IN ABOUT AEE FOUNDATION CONTACT US SEARCH

From Pneumatic to DDC
in 20 Minutes

- 1. Identify pneumatic thermostats



- Fever hot/cold calls
- BACnet integration with BAS
- 18-month payback

ASSOCIATION OF ENERGY ENGINEERS

To promote the scientific and educational interests of those engaged in the energy industry and to foster action for sustainable development

HOME MEMBERSHIP CHAPTERS CERTIFICATIONS CONFERENCES SHOWS SEMINARS PUBLICATIONS JOBS RESOURCES AWARDS ADVERTISING

Detailed Certification Listings

AEE Certified Professionals Directory

Certification Q&A

Renewing Your Certification

Retest Q&A

AEE CERTIFICATION FORUM

BEP

BEPIIT

BESA

BEST

CBCF

CBCP

CBCP Masters Level

CDSM

CEA

CEA Masters Level

CEAIT

CEM

Code of Ethics for Energy Engineers and Managers

CEM Certification Application and Study Guide for Live AEE Seminars

CEM Certification Application and Study Guide for Remote Testing Centers

SEMINAR - 5-Day Training Program

SEMINAR - Fast Track

...more

CEM - Certified Energy Manager

Certifications



CEM Utilized Around the World
&
Recognized Standard of Professional Achievement

(click here to see what companies and government agencies are requiring a CEM).

Sign up to Receive the AEE Energy e-Newsletter, FREE!
 *Email

* = Required Field

Submit

ATTENTION CEMS!
 Order your official
 CEM Stamp

The Certified Energy Manager® (CEM®)

Program for Professional Certification

- How to Apply for CEM Certification
- CEM Application (Exam to be Taken in Conjunction with Live AEE Training Seminar)
- CEM Application (Exam to be Taken at Remote Testing Center)
- Request ADA Testing Accomodations
- Order CEM Reference Books
- Order Duplicate CEM Certificate
- CEM Guidelines for AEE Chapters
- Code of Ethics for Energy Engineers and Managers
- CEM Retesting Application
- Appeal of Eligibility or Exam Results
- Videos to help prepare for the CEM seminar

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Slides from Previous Webcasts

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Tuesday Webcasts for Industry

Learn about AMO's software tools, technologies, partnership opportunities, and other resources by watching the Tuesday Webcasts for Industry. They are held on the first Tuesday of every month from 2:00 to 3:00 p.m. Eastern time and are presented by manufacturers, AMO staff, and industry experts.

Register to participate in upcoming Tuesday webcasts by visiting the AMO [Events Calendar](#) or [Training Calendar](#). Each entry includes the webcast's date, topic, and registration link, and a detailed description.

Archived Webcasts for Industry

Presentations from previous webcasts are listed below by topic, then by date. Webcasts from 2010 on are also available as audio files.

- [Data Center Efficiency](#)
- [Energy Assessments](#)
- [Energy Management and Financing](#)
- [Energy Systems](#)
- [AMO Program Overview](#)
- [AMO Software Tools](#)
- [New and Emerging Technologies](#)
- [Partnerships](#)

Data Center Efficiency

- April 23, 2009 – [Data Center Assessment Case Study: Verizon](#)
- November 13, 2008 – [Assessing Data Center Energy Use](#)

[Back to Top](#)

Energy Assessments

- October 11, 2011 – [Unveiling the Implementation Guide](#)
- May 7, 2009 and April 16, 2009 – [Energy Assessment Results: Most Commonly Identified Recommendations](#)
- February 19, 2009 – [Energy Assessments: What are the Benefits to Small- and Medium-Size Facilities?](#)
- February 12, 2009 – [Energy Assessments: What are the Benefits to Large Facilities?](#)
- November 6, 2008 – [Energy Assessments: What are the Benefits to Small and Medium Facilities?](#)
- October 16, 2008 – [Energy Assessments: What are the Benefits to Large Facilities?](#)

To access the slides from this and previous Webcasts, please visit:
http://www1.eere.energy.gov/manufacturing/resources/tuesday_webcasts.html

Next Month's Webcast

**Please
join us
for our
next
Webcast.**

Topic: Better Buildings, Better Plants: How You Can Benefit, plus New Executive Order on Industrial Energy Efficiency

Date and Time: Tuesday, October 9 at 11:00 a.m. PDT/2:00 p.m. EDT

To Register:
<https://www1.gotomeeting.com/register/769354057>
