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
Immediate CP Priorities

• 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™ 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
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 establishes a framework for industrial and commercial facilities and organizations to manage energy.

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*

- **facilities**
- **equipment**
- **personnel**
- **systems**
- **processes**
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.
Certification Requirements:

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


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
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**

<table>
<thead>
<tr>
<th>First Facilities Certified to Superior Energy Performance</th>
<th>% Energy Performance Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook Composites and Polymers Houston, TX</td>
<td>14.9</td>
</tr>
<tr>
<td>Freescale Semiconductor, Inc. West Austin, TX</td>
<td>6.5</td>
</tr>
<tr>
<td>Owens Corning Waxahachie, TX</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Dow Chemical Company</strong> Texas City, TX (manufacturing facility)</td>
<td>17.1</td>
</tr>
<tr>
<td><strong>Dow Chemical Company</strong> Texas City, TX (energy systems facility)</td>
<td>8.1</td>
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</tbody>
</table>
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:

- 3M
- Alcoa
- Allsteel
- Amcor PET
- Ascend Performance Materials
- Bentley Prince Street
- Bridgestone Tire
- Coca-Cola
- Cook Composites & Polymers
- Cooper Tire
- Cummins
- Didion Milling, Inc
- Dixie Chemical
- Dow Chemical
- Eaton
- General Dynamics
- Harbec Inc.
- Haynes International
- Holcim
- Ingersoll Rand
- JR Simplot
- Kenworth Trucks
- Lockheed Martin
- MedImmune
- Neenah Foundry Company
- Nissan
- OLAM Spices
- Republic Conduit
- Schneider Electric
- Spirax Sarco
- Traco
- UTC/Sikorsky
- United States Mint
- Volvo
- World Kitchen

http://www.eere.energy.gov/industry/energymanagementdemonstrations/
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.superiorenergyperformance.net/certified_practitioners.html
Verification Bodies will be accredited by ANSI/ANAB, based on requirements of the (ANSI) MSE 50028 standard (Nov. 2012)

Certified SEP Audit Team

- **SEP Performance Verifier**
  - CP EnMS certification is required prerequisite + additional exam and qualifications

- **SEP Lead Auditor**
  - 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)

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.

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

ANSI MSE 50028
(Requirements for Verification Bodies)

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

For each of the following professionals:
- CP in EnMS
- CP in each system type
- SEP Lead Auditor
- SEP Performance Verifier

Certification Scheme Committee

Job Task Analysis (Blueprint)

Training Curriculum

Exam & Certification Scheme

Professional Training Organization
(Use training licensed from U.S. DOE)

Professional Certification Body
(Accredited by ANSI in accord with ANSI/ISO/IEC 17024)
Certified Practitioner in Energy Management Systems (CP EnMS)

Certification Scheme Committee

Job Task Analysis (Blueprint)

Training Curriculum

UL-DQS and GaTech/AEE
(Use training licensed from U.S. DOE)

Exam & Certification Scheme

Institute for Energy Management Professionals (IEnMP)
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
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

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

<table>
<thead>
<tr>
<th>Dates</th>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 2, 2012</td>
<td>Georgia Tech Global Learning Center, Atlanta, GA</td>
</tr>
<tr>
<td>Feb. 21, 2013</td>
<td>Georgia Tech Global Learning Center, Atlanta, GA</td>
</tr>
<tr>
<td>Mar. 7, 2013</td>
<td>GlobalCON, Philadelphia, PA</td>
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<tr>
<td>May 16, 2013</td>
<td>Georgia Tech Global Learning Center, Atlanta, GA</td>
</tr>
<tr>
<td>Jun. 20, 2013</td>
<td>Energy Management Congress, Las Vegas, NV</td>
</tr>
<tr>
<td>Nov. 7, 2013</td>
<td>Georgia Tech Global Learning Center, Atlanta, GA</td>
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http://www.ienmp.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:

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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
ISO 50001
ANSI/MSE 50021
SEP Protocol
SEP M&V Protocol for Industry
SEP Industrial Facilities Best Practices Scorecard
Consists of:

- Online pre-courses
- Face-to-face training
Introduction to ISO 50001

Introduction to Superior Energy Performance

Case Study
Day 1:

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

(c) 2012 GA Tech Research Corp.
Day 2:

- EnPI, Baselines and Energy Performance
- Objectives, Targets and Action Plans
- M&V Protocol
Day 3:

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

  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

Certified Energy Manager

The Association of Energy Engineers
Who is this Guy?

Eric Woodroof, Ph.D.
“Woody”

2011 President of AEE
Board Member for CEM & CRM
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
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.
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.
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.
Certification Reqs.

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

<table>
<thead>
<tr>
<th>Codes and Standards</th>
<th>Min</th>
<th>Max</th>
</tr>
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<tbody>
<tr>
<td>Energy Accounting and Economics</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Energy Audits and Instrumentation</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>Electrical Systems</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>HVAC Systems</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Motors and Drives</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Industrial Systems</td>
<td>4%</td>
<td>6%</td>
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<tr>
<td>Building Envelope</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>CHP Systems and Renewable Energy</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Fuel Supply and Pricing</td>
<td>4%</td>
<td>5%</td>
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<tr>
<td>Building Automation and Control Systems</td>
<td>4%</td>
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<tr>
<td>High Performance Buildings</td>
<td>4%</td>
<td>5%</td>
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<tr>
<td>Thermal Energy Storage Systems</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Lighting Systems</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>Boiler and Steam Systems</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Maintenance and Commissioning</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Energy Savings Performance Contracting and Measurement and Verification</td>
<td>4%</td>
<td>5%</td>
</tr>
</tbody>
</table>
CEM Training

Offered via:
• Live Seminars (all over world)
• Online Seminars
• Local Chapters
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.
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.
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
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).

- 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

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

*Email

* = Required Field

Submit

ATTENTION CEMs!
Order your official CEM Stamp

CEM Certified Energy Engineers

EnergyVortex Top Jobs
VP, Engineering
Director, Facilities & Environmental Services
Sr. Energy Engineer
Project Manager/Senior Energy Advisor
Energy Engineer
Facilities Engineer SF
Energy Engineer
Business Development Manager
Principal, Sustainability Engineering
Resource Efficiency Manager-REM
Submit a Position | Find a Position
Ask AEE how to get involved:
www.aeecenter.org
770-447-5083
Slides from Previous Webcasts

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](https://www1.gotomeeting.com/register/769354057)