

# Charting a Course to Energy Independence

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Energy Manager Training  
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# Green Jobs: Survey of the Energy Industry

- The Association of Energy Engineers (AEE), a nonprofit professional society of over 9,500 members, issued a survey to its members to determine the need for Green Jobs, Energy Industry Potential and Salary Data. The results represented are based on 978 responses and are outlined in this report. AEE was founded in 1977 and its mission is “to *promote the scientific and educational interests of those engaged in the energy industry and to foster action for sustainable development.*”



# 1. Survey Results

- **Forty-one percent (41%)** of the energy professionals who were surveyed plan to retire in the next ten years.
- **Seventy-two percent (72%)** of energy professionals indicate a heightened shortage of qualified professionals in the energy efficiency and renewable energy fields in the next five years.
- **Seventy percent (70%)** of energy professionals indicate a need for national and state training for "Green Jobs" to address job shortages that are impairing growth in green industries, such as energy efficient buildings and construction, renewables, electric power, smart grid, energy efficient vehicles and biofuels development.



## 2. The American Recovery and Reinvestment Act of 2009 (ARRA) will fund:

### A) Energy Efficiency

- \$3.1 billion for State Energy Programs which will encourage states to improve building energy improvement and retrofits.
- \$5 billion for weatherization of low income housing.
- \$4.5 billion for Green Federal Buildings.
- \$3.6 billion for the Department of Defense for energy efficient projects and facilities upgrade.
- \$3.2 billion for Energy Efficiency and Conservation Block Grants to help state and local governments implement energy efficiency.
- \$500 million dollars for job training, and programs to prepare individuals for careers in energy efficiency and renewable energy.

*According to the Alliance to Save Energy, the energy efficiency measures will create 100,000 or more new energy jobs in the next two years. [www.ase.org](http://www.ase.org)*



## B) Solar Energy

The American Recovery and Reinvestment Act contains provisions for:

- **Renewable Energy Grant Program:** Offers Department of Energy grants equal to thirty percent (30%) of the cost of solar projects started in the next two years, including large-scale utility projects. This is a critical alternative to solar tax credits that are not functioning as Congress intended in the current economic climate.
- **Loan Guarantee Program:** Creates a new, streamlined loan guarantee program to support financing of renewable energy systems, including solar energy technology.
- **Manufacturing Investment Credit:** Creates a thirty percent (30%) investment tax credit for facilities engaged in the manufacture of renewable energy property or equipment.

*According to the Solar Energy Industries Association a total of 119,000 jobs over the next two years will be created for solar panel installation, manufacturing components and solar power plant construction.*

[www.seia.org](http://www.seia.org)



## C) Smart Grid/Advanced Battery/Energy Efficiency:

- \$30 billion will be provided for such initiatives as a new, smart power grid, advanced battery technology, and energy efficiency measures. According to the fact sheet, 500,000 energy jobs will be created. *Source: [Fact Sheet of Speaker Nancy Pelosi](#) – Wall Street Journal*

## D) Growing Energy Market

- The revenue for the energy management services market in North America in 2008 was \$20.35 billion (USD) and is projected to double to over \$40 billion (USD) by 2013 due to favorable new government legislations and increased knowledge about the benefits of energy management. *Source: [Frost & Sullivan](#)*



# Definition of Energy Management

The objective of *Energy Management* is to achieve optimum energy utilization and:

- Minimize Energy Costs without affecting production and quality
- Minimize Environmental Impact

Barney L. Capehart, Ph.D., CEM, Wayne C. Turner, Ph.D., P.E., CEM and William J. Kennedy, Ph.D., P.E., in their book *Guide to Energy Management*, 6th Edition, define Energy Management as follows:

- “The efficient and effective use of energy to maximize profits (minimize costs) and enhance competitive positions.”

Essentially, the goal of energy management is to produce goods and provide services with the least cost and least environmental effect.



- The term *Energy Management* refers to the management of energy consumption. This notably means improving the efficiency of powered devices such as electrical equipment or vehicles and the development of renewable energies.
- The Energy Manager must understand the interrelationship of electrical, heating ventilation and air conditioning, building systems, combustion and process systems, and how to maximize system performance in a cost effective manner.
- The Energy Audit is the key to a systematic approach for *energy management decision making*.



# What do Companies Expect of an Energy Manager?

- **For Example, a Job Offer for a Resource Efficiency Manager:**

- **Job Details:**

We are motivated to hire Resource Efficiency Managers. Seasoned professionals with deep subject matter knowledge and dynamic early career professionals with strong educational pedigrees are highly sought after...Our client serves markets such as government, higher education, manufacturing, energy, and real estate. This wide range of markets requires wide ranging solutions - relevant in both private and public sectors. We need an REM with preferred PE license or environmental science degrees with niched area of experience.

- **Specialties Desired:**

CEM Certified Energy Manager  
CEP Certified Energy Procurement Professional  
Commissioning  
Construction Engineering  
Consultants  
Energy Engineer  
Energy Sector  
Engineering Design  
Engineering Management  
Facilities Engineering  
Government  
Government & Infrastructure  
Manufacturing  
P.E. Professional Engineer



# Training for Energy Managers

## Energy Policy Act of 1992, Section 151

- The Definition of a “trained energy manager” is “a person who has demonstrated proficiency, or who has completed a course of study in the areas of fundamentals of building energy systems, building energy codes and applicable professional standards, energy accounting and analysis, life-cycle cost methodology, fuel supply and pricing, and instrumentation for energy surveys and audits”.
- The Certified Energy Manager (CEM) Program covers the above training requirements.

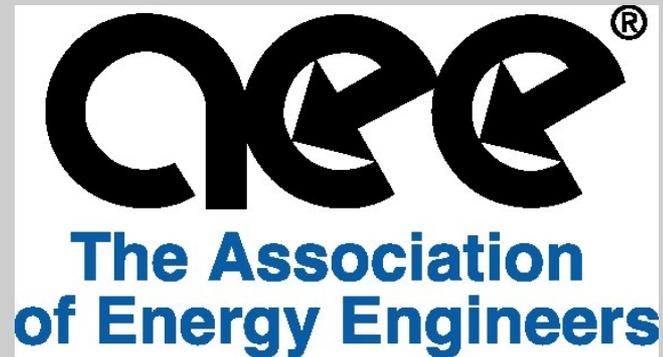


# The Body of Knowledge Required for Energy Managers

- The CEM course covers what an energy manager needs to know in order to reduce energy consumption of a facility in a cost effective manner.
- The energy manager needs to understand the principles and practices of life cycle costing when analyzing the energy conservation opportunities.
- The energy audit is a systematic approach to identifying energy waste within a facility and identifying opportunities for cost effective changes.
- Energy conservation opportunities can be identified in:
  - HVAC Systems
  - Controls
  - Building Energy Systems
  - Lighting systems
  - Boiler and steam systems
- The efficient procurement of energy can greatly reduce the overall energy cost.
- The energy manager needs to measure and verify the savings (M&V).



# Training Opportunities



The Association of Energy Engineers offers a variety of professional training and re-training programs, including...



# Certified Energy Manager

**CEM**<sup>®</sup>

The Most Recognized and Respected Certification in Energy Management, Both in the United States and Internationally

- The Certified Energy Manager (CEM) was established in 1981 to meet the growing needs of individuals and organizations wishing to advance their position in the energy efficiency field. The Association of Energy Engineers (AEE) has certified more than 15,000 professionals.
- The CEM is used in the following ways:
  - Air National Guard - selected the Certified Energy Manager's Program for continuing education of its energy and facility engineers throughout the United States.
  - The State of Virginia - requires that any agency with an annual energy budget of \$1,000,000 or more have a CEM on staff.
  - National Grid - offered an Energy Efficiency Engineering Study whereby it will Finance 50% (up to \$10,000) of the cost incurred as part of an approved energy efficiency engineering study. "The study must be completed by a *Certified Energy Manager (CEM)* or a professional engineer (PE)."
  - For more information, please visit  
<http://www.aeecenter.org/certification/CEMarticle.pdf>



# Live Seminars

Live seminars consist of two-, three-, and five-day programs of live classroom studying instructed by top industry experts.

We hold a variety of professional seminars and certification training courses at hotels and convention facilities across the U.S. throughout the calendar year.

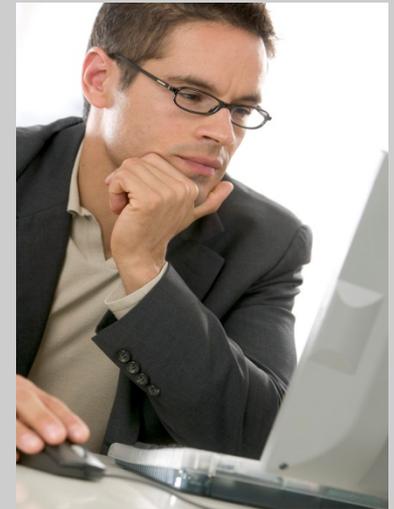
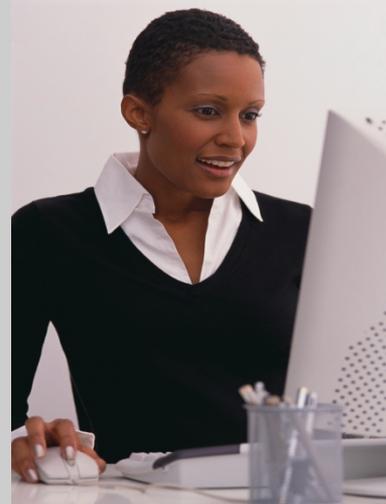




# Real-Time Seminars

## Realtime Online Seminars:

AEE's real-time distance learning programs deliver a truly "live" dynamic instructional program directly to your home or office. When you log onto one of our virtual classrooms, you will both hear and see the instructor's presentation in real time. All you need to participate is access to both the internet and a telephone. There are a variety of courses available: see <http://www.aeecenter.org/realtime>





## Training Partnerships:

The Association of Energy Engineers is currently working with a cross-section of accredited institutions, organizations and Universities to offer additional energy management, green, sustainable, renewables and industry training & educational programs. Featured programs include:

- The Association of Energy Engineers (AEE) has a Memorandum of Understanding with UC Davis University Extension (UCDE) to advance the knowledge and professionalism in the field of energy management. As an adjunct to the Certified Energy Manager (CEM®) and Business Energy Professional (BEP® program) AEE pleased to be an official sponsor of the **U.C. Davis University Energy Resource Management Certificate program**.
- The Association of Energy Engineers and the GHG Institute have signed Cooperative Agreement to offer additional educational & training options to their respective members.
- Willis College is offering the Clean Energy & Renewable Energy Project Feasibility Analysis Training Series. AEE is adding a series of nine courses focusing on Clean Energy/Renewable Energy Project Feasibility Analysis to its 24/7 Online Seminar Program via training partnership with Willis College.
- AEE has teamed up with the University of Wisconsin -Madison Engineering Professional Development Department to offer Fundamentals of Lighting Efficiency training seminar on a real-time, online basis.
- AEE Partners the Green Building Engineer Certification (GBE™) Program with US EPA ENERGY STAR Challenge. AEE's participation in the ENERGY STAR Challenge – Build a Better World 10% at a Time is a natural extension of AEE's efforts to encourage its members to reduce energy usage in buildings by 10% or more. AEE is committed to provide training and certification opportunities to help the profession meet the ENERGY STAR Challenge ahead.
- The Association of Energy Engineers is a qualified education provider under the U.S. Green Building Council educational program and its programs are featured in the [GREENBUILD 365 course catalogue](#) .





# AEE and the Government working together for a Greener Energy Future.

