LESSON 1
INTRODUCTION TO ENERGY MANAGEMENT
QEM 570
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Learning Objectives
After this presentation you will be able to:
- define energy management
- explain the importance of energy management
- assess the current state of energy policies
- identify energy management careers and their educational requirements
Definition of Energy Management

What is energy management?

**One Definition**
The efficient and effective use of energy to maximize profits (minimize cost) and enhance competitive positions

Consider a business process as a system with inputs and outputs

Business Process Model

Controlling and managing consumption of energy part of total process optimization
Other Energy Management Objectives

Improve efficiency by reducing wasted energy

Reduce emissions and air pollution

Foster “Green” business image

Develop and maintain energy monitoring and benchmarking - promote efficiency

Why Energy Management?

Increase the returns from invested energy

More product per kWh or BTU

Reduce impact of energy supply interruptions/price shocks
Global Impacts of Energy Management

Extend supply of limited fuels (Fossil Fuels)

Reduce impact on electric grid
Reduce need for additional power plants/transmission lines

Reduce production of greenhouse gases CO$_2$

Energy Management Economic Impacts

Cost reductions improve profits

Low investment savings:  5-15 % 

Moderate investment savings:  15-30 %  

Long term high cost savings:  30-50 %  

New Facilities - potential cost savings:  80 %
Energy Management Nation Affects

Reduce consumption
Reduce imports

Reduce environmental affects
Improve business competitiveness

Acid Rain  Ozone Depletion
Climate change
High energy cost = high product costs

National Energy Policies

American Recovery and Reinvestment Act 2009

Energy Independence and Security Act 2007

Energy Efficiency
Green Federal Buildings
DOD energy efficiency projects
Local government grants
Solar energy – new technology credits

Improve vehicle fuel efficiency
Increase Biofuel production
Improved appliance and lighting
Increase saving in buildings and industry
Efficiency Incentives
Small business grants and loans
National Energy Policies

**Energy Policy Act 2005 (EPACT)**
- Energy Management Goals
  - 10 year reduction 2%/year
  - Electric metering federal buildings
  - Reduce federal building consumption 30% (below ASHRAE)
  - Federal solar energy
  - Increase renewable consumption

**Tax Provisions**
- Tax credits for home solar electric and hot water
- Tax deductions for high efficiency buildings
- Business tax credits for PV arrays and fuel cells

**Energy Policy Act 1992**
- Minimum Building Standards
  - Utility integrated resource planning
  - Supply efficiencies
  - New supply options
- Legal changes allow wholesale power competition
- Whole sale power generators

**Public Utilities Regulatory Policies Act 1978 (PURPA)**
- Allowed Industrial Cogeneration
  - Utilities must purchase excess
  - Guarantees Utility connections
  - Reduces regulation on cogen's
Energy Management Careers and Certifications

Field growing and needs young talent
35% retire within 5 years

National Association: Association of Energy Engineers (AEE)
Certification and Testing
Certified Energy Manager (CEM)
Certified Business Energy Professional (BEP)
Residential Energy Auditor (REA)
Certified Energy Auditor (CEA)

Certifications required for certain positions

Energy Management Careers and Certifications

Certification Advantages

Federal state and local agencies require plan review by certified professional

Business public and private also require certified professional review for financing

Indicates individuals who meet approved pre-qualifications, experience and testing requirements

Recognized nationally and internationally

Lends credibility to those in energy field
Energy Management Careers and Certifications

Certification Disadvantages

Typically require combination of education experience and testing which maybe difficult to achieve

Requires pretest coursework and associated expense  $1500 -$2300

Requires continuing education requirements and expenses

Typical Certification: Certified Energy Manager

Prerequisites

• A four-year engineering degree or architecture degree. Or a Professional Engineer (PE) or Registered Architect (RA) with at least three years experience in energy engineering or energy management.

• A four-year degree in environmental science, physics, or earth science management, with at least four years experience in energy engineering or energy management.

• A four-year business or related degree, with at least five years experience in energy engineering or energy management.

• A two-year technical degree, with eight years experience in energy engineering or energy management.

• Ten years or more verified experience in energy engineering or energy management.
Typical Certification: Certified Energy Manager

Required course and fees

• 5-Day Comprehensive CEM Training Seminar: $1,695 for AEE members / government / nonprofit; $1,895 for non-AEE members

• Certification Application and Examination:
  • $300 if the exam is taken in conjunction with AEE’s 5-day live CEM training seminar
  • $400 if the exam is taken at an ACT remote testing center following completion of AEE’s real-time online CEM training seminar

End Lesson 1

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