

State of South Carolina Accredited Commercial Energy Manager Workshop & Exam



This 3½-day workshop provides energy managers with a thorough overview of the many factors that affect commercial energy consumption as well as a foundation for identifying energy-saving investment opportunities. The overall objective of this training is to prepare attendees to perform commercial energy audits and provide energy management services to South Carolina's commercial sector and State of S.C. governmental facilities.

Areas of concentration include the commercial thermal envelope, electrical, lighting, and HVAC fundamentals as well as energy auditing procedures. Also covered are energy savings calculation methods and simple payback, simple rate of return and net present value calculation procedures.

THIS IS ADVANCED TRAINING. Attendees should have completed residential energy auditing training and/or have a solid foundation in energy science. Additionally, attendees should have a sound background in high school general math, algebra I and geometry.

A 2½ hour, 60 question, open-book exam will be administered on the morning of the fourth day. Candidates passing the exam will be awarded a certificate from the South Carolina Energy Office qualifying them as a **South Carolina Accredited Commercial Energy Manager.**

Along with a detailed workbook, each attendee will receive the following:

- Operations & Maintenance Best Practices - U.S. Department of Energy
- Laminated, full-color **EnergyFactMonster**

Our instructor, Jim Herritage, CEM®, LC of Energy Auditors, Inc. has been providing energy training since 1980 and provides commercial and lighting workshops around the country.

Workshop Outline

- a) Basic Energy Units and Terms
- b) Calculating Delivered Cost per MMBtu
- c) Calculating Heat Transfer
- d) Electrical
 - 1) Terms
 - 2) Motors & Pumps
 - 3) Power Factor
- e) HVAC
 - 1) Terms
 - 2) Refrigerant Circuit
 - 3) Fan Laws
 - 4) Maintenance
- f) Lighting
 - 1) Terms
 - 2) Light Sources
 - 3) Ballasts
 - 4) Calculations
- g) Water Heating
- h) Energy Savings Calculations
 - 1) Simple Payback
 - 2) Simple Rate of Return
 - 3) Net Present Value

Sample Exam Questions

1. You are currently buying natural gas for \$1.03 per therm and burning it at an efficiency of 85%. At what price / gallon would you need to buy #2 fuel oil and burn it at an efficiency of 83% efficiency to be the equivalent cost of heat?
2. What is the percentage of outside air when return air temperature is 76°, outside air temperature is 95° and mixed air temperature is 79°?
3. Please calculate the ΔU when you raise the R-value from R10 to R25.
4. kW = 390, kVA = 475. Calculate the kVAR to correct power factor to 100%.
5. An energy measure costing \$5,000 will produce cost savings of \$2,250 per year over four years. What is the net present value for this series of cash flows if the company's minimum attractive rate of return is 9%? Salvage value is \$0.00.
6. A commercial dishwasher needs 20 GPM of water for its final rinse to be heated from 160° to 180°. Please calculate the required KW of the booster heater.
7. Please calculate the foot-candle illuminance on the floor from a vertically-mounted light source 15 feet directly overhead, having a luminous intensity of 30,000 candela.
8. What is the surface area of a box measuring 1" x 2" x 3"?

**A listing of ACEM's may be found at
<http://www.energy.sc.gov/ascem/course>**