

Energy Conservation Basics

Course 376: Energy Conservation Basics

Covers energy sources and the history of energy usage. Examines alternative energy sources and their feasibility. Identifies current energy usage patterns and places where energy can be conserved. Explains how to recognize energy waste, and includes sample corrective actions. Explains how to conduct an energy survey.

TPC Training is accredited by IACET to offer **0.5 CEU** for this program.



Lesson 1: Energy and its Sources

Topics

What is Energy?; How Fossil Fuels Developed; Mining and Drilling Methods; Putting Fossil Fuels to Work; Nuclear Power; Nuclear Reactors; Solar Energy; Converting Solar to Electrical Energy; Wind as an Energy Source; Hydroelectric Power; Evaluating Energy Sources; Measuring Energy

Objectives

- Define energy and list several potential energy sources
- Explain how fossil fuels developed and how they are extracted from the earth.
- Explain, in simple terms, how uranium produces energy.
- List at least one advantage and one disadvantage of each of the following: oil, natural gas, coal, solar power, wind energy, and hydroelectric power.
- Tell how heat and temperature are measured (what units).

Lesson 2: Why the Energy Crisis?

Topics

History of Energy Use; The Fossil Fuel Age Begins; America Strikes Oil; Other Traditional Sources; How Much Energy is Enough?; WWII and After; The End of Cheap Oil; World's Energy Record; Fossil Fuel Reserves; Increase in Coal Use; Fossil Fuels Produce More Than Energy; Alternative and Synthetic Fuels; Gas and Oil from Coal; Nuclear Fuels; Nuclear Fusion; Geothermal Energy Sources; Biomass

Objectives

- Define the fossil fuel age and list the energy sources that made it possible.
- Name some of the factors that contributed to the greatly increased use of fossil fuels in the past century.
- Describe the outlook for fossil fuel availability in the next century.
- Give examples of current efforts to develop alternative sources of oil and gas.
- Identify potential sources of future energy and describe their present limitations.

Lesson 3: Energy Consumption and Loss

Topics

Using Fuels to Generate Electricity; Fuels Most Often Used; Energy Losses in Consumer Areas; Effects of Climate on Energy Use; Degree-Days; Cooling Degree-Days; Using Degree-Day Figures; Where Can Energy Be Conserved?; More Savings; The Cost of Saving Energy; ROI and Payback Period; Establishing Priorities

Objectives

- Tell why generating electricity is an inefficient use of energy and what characteristics of electricity justifies this inefficiency.
- Compare energy use in the three categories of energy consumers.
- Explain degree-days and how they are used?
- State why a building's HVAC system is a good place to start looking for potential energy savings.
- Tell how to calculate the payback period of an energy conservation plan.

Lesson 4: Practical Conservation Measures

Topics

Recognizing Energy Waste in Building Structures; Correcting Energy Waste in Building Structures; Energy Loss in Heating and Cooling; Sample Heating/Cooling Corrective Measures; Energy Waste in Mechanical Systems; Some Energy Savers for Mechanical Systems; Recognizing Electrical Energy Waste; Electrical Conservation Examples; Electric Utility Charges; Computer Monitoring and Control

Objectives

- Recognize energy waste conditions in building structures.
- Name at least three factors that affect boiler and furnace efficiency.
- Give examples of energy waste in a building's mechanical system and how it might be eliminated.
- Explain peak demand and why it is important in electricity costs.
- Tell how computer monitoring and control can be used to save energy and lower utility costs.
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Lesson 5: Conducting an Energy Audit

Topics

What Is an Energy Audit?; Mini-Audits; Tools Required for the Energy Survey; Sample Energy Audit; Fuel Usage Information; Building and Equipment Data; Conservation Opportunities; Priorities

Objectives

- Name and describe the six segments of a detailed energy audit.
- Define a mini-audit and tell when it might be used.
- List the tools required for an energy survey of any building.
- Record the data necessary to make up an energy audit.
- Explain the procedure for assigning priorities to energy-saving projects.