

BOC 1002 - Measuring and Benchmarking Energy Performance

Credits:	1
Lecture:	6 hours
Project:	3 hours
Group Exercises:	1 hour
Total:	10 hours

Prerequisites: BOC 1001 or Equivalent

Class Description: Participants will learn how to perform quantifiable evaluations of their facilities' energy use in order to be able to target prospects for energy conservation and greenhouse gas reduction. Participants will learn energy management planning techniques and the basic principles of energy accounting to identify ways to improve efficiency, conserve resources, and reduce emissions.

PROJECT: Benchmark Your Building in Energy Star™ Portfolio Manager.

Learning Objectives

At the completion of Measuring and Benchmarking Energy Performance a participant will be able to:

1. List major energy loads in commercial buildings.
2. Convert energy units to BTUs and calculate energy use index for your building.
3. Cite the benefit of using spreadsheets and other tools to compute energy use intensity and construct energy profiles for fuels used in the building.
4. Identify and prioritize conservation opportunities.
5. Identify opportunities to improve operation and maintenance procedures.
6. Benchmark a building.

Textbook

BOC 1002 - *Measuring and Benchmarking Energy Performance Handbook*, NEEC

Special Equipment: None

Evaluation

- | | |
|-------------------------|-----|
| a) Application project: | 50% |
| b) Test: | 50% |

Class Outline

1. Energy Conservation & Facility Management

- 1.1. Steps for Efficient Operations
- 1.2. Operational Strategies
- 1.3. On-going Steps
- 1.4. Energy Management Recap
2. Conservation Programs
 - 2.1. Utility
 - 2.2. State
 - 2.3. Voluntary
 - 2.4. Other funding options
3. Energy Fundamentals
 - 3.1. Common Energy Sources & End Uses
 - 3.2. Fuel Units & Conversions
4. Utility Bills & Rate Structures
 - 4.1. Smart Meters
 - 4.2. Consumption vs. Demand
 - 4.2.1. Energy charges v. demand charges
 - 4.2.2. Demand measurement
 - 4.3. Typical Billing Components
 - 4.4. Rate Structures
 - 4.4.1. Seasonal
 - 4.4.2. Time-of-Use
 - 4.4.3. Block
5. Energy Accounting
 - 5.1. Steps of Energy Accounting
 - 5.1.1. Collecting and organizing utility data
 - 5.1.2. Organizing Utility & Building Data
 - 5.1.3. Calculating the Energy Use Index (EUI)
6. Building Energy Analysis
 - 6.1. Data Presentation
 - 6.1.1. Charts and graphs
 - 6.1.2. Consumption/Demand Profiles
 - 6.2. Benchmarking
 - 6.2.1. Baseline Profiles
 - 6.2.2. Performance Indicators
 - 6.2.3. Benchmarking Tools
 - 6.2.3.1. Energy Star™ Portfolio Manager
7. Trend Analysis
 - 7.1. Base & Seasonal Loads
 - 7.2. Degree Days
 - 7.2.1. Heating
 - 7.2.2. Cooling
 - 7.3. Metering

- 7.3.1. Data Loggers
- 7.3.2. End-use Analysis
- 8. Putting it All Together
 - 8.1. Review & Gather Data
 - 8.2. Establish Baseline
 - 8.3. Benchmark
 - 8.4. Analyze, Identify, Prioritize
- 9. Course Project
 - 9.1. . Benchmark your building in Energy Star™ Portfolio Manager