Building Operator Certification – Level I

A Partnership of the NYC Department of Education Division of School Facilities, International Union of Operating Engineers, and the City University of New York

Department of Education
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The City University of New York

Class 25

Today's Objectives and Topics

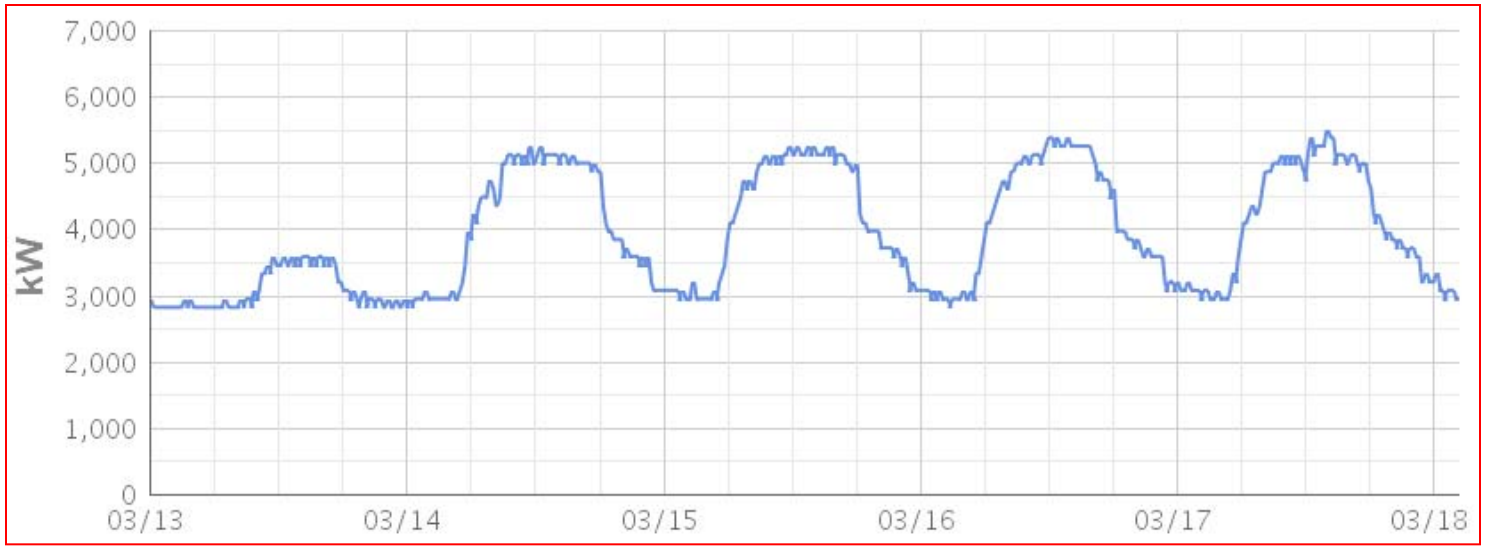
- Collect Project 2B – Please turn in now
- Conclude Module 5
  - energy data & the energy efficiency process
  - next generation energy data
  - practice interpretation of trends from data
  - evaluate module learning
- Exam Review (brief) and Exam
- Introduce next (and final!) module
  - Practical Project
  - Energy Audit Report

The Energy Efficiency Process

- Establish Baseline
- Estimate / allocate energy to end-uses
- Determine Normalizing variables
- Develop comparisons - peers
- Identify improvement steps (measures)
- Implement measures
- Monitor results (against baseline)

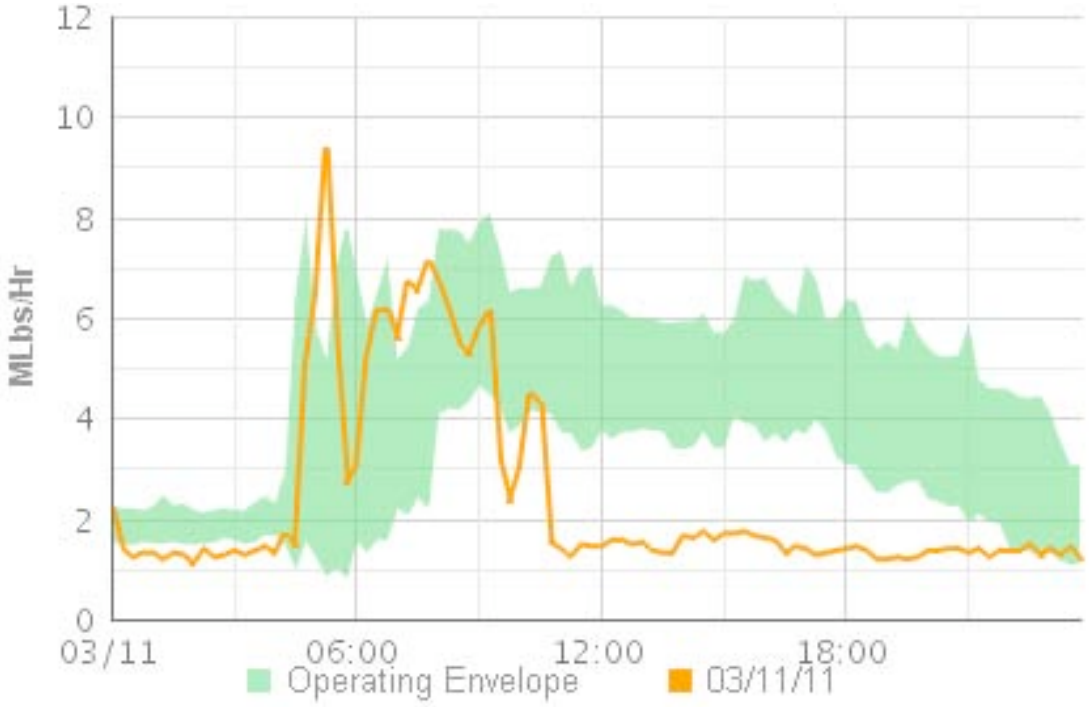
Establish Baseline

- Related to load profile – energy use over period of time
- Normal range of usage across several years
- At whatever time-scale data tools permit
  - Monthly, weekly, daily, 15-minute



Courtesy Mach Technologies

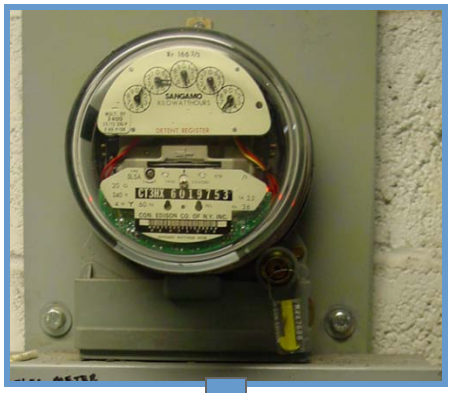
Use baseline to see if my building is staying within bounds – or doing better!



Courtesy Mach Technologies

- Historical data provides the (green) background – normal operating bounds
- Track current usage against history

Metering



EnergyStar Portfolio Manager
or other Reporting Format

- Acquire data
- Know how to use it effectively

Metering
Digital Data and “Smart Meters”

Added Value

- Record **Time-of-use**
- Know when peaks occur
- Real time reads
- Remote reads
- Direct to database

Converting meters to Digital

- New utility meter with Pulse Output transmitter
- Optical Reader

Metering
Getting Even More "Granular"

Metering down to the circuit and device levels

"Kill-A-Watt" devices

- **Plug an appliance into the metering device**

Wireless sub-meters

Smart Circuit Breakers

- **Solid-state breakers with intelligence – just coming onto the market**
- **Provide circuit fault detection + usage**

KPI – Key Performance Indicators

- Observations of equipment operation or building conditions that indicate energy use
- Similar to benchmarking, as it allows you to make improvements in the energy usage of your building

- Practical observations you can make
  - Open windows / day
  - Lighting-hours-on / day
  - Boiler cycles / day
  - Condensate temperature

Module 5 Evaluation

- How did this module go?
- Did you learn interesting, useful things?
- Did we achieve our Learning Objectives?

- How did the Herzog book work?
- How did the Project go?
  - Experience with Excel. Cautions about spreadsheets

Next (and final!) Module 6

Operational Energy Improvements

- What are they?
- How to characterize?
- Can we implement?

Operational Energy Improvements

Practical Project 2C

- Read instructions
- Discuss
- Select the Energy Improvement Project – next week

Energy Audits

- How they are done
  - Process and Objectives
  - The facility operator's role

- Reading and using the Energy Audit Report
  - Standard sections of the report
  - What to look for
  - The facility operator's role in Quality Control

Close

Reminders for next week:

- Keep reading Herzog, if you have not already been through it.
- Be prepared to discuss Improvement Projects, in particular one that is relevant to your facility …. And that is largely within your control to implement
- Scan/overview reading of the sample Energy Audit Report.