Blended Building Operator Training Program Positions New York City Municipal Buildings for Energy Conservation

International Conference on E-Learning in the Workplace
Columbia University, New York, NY
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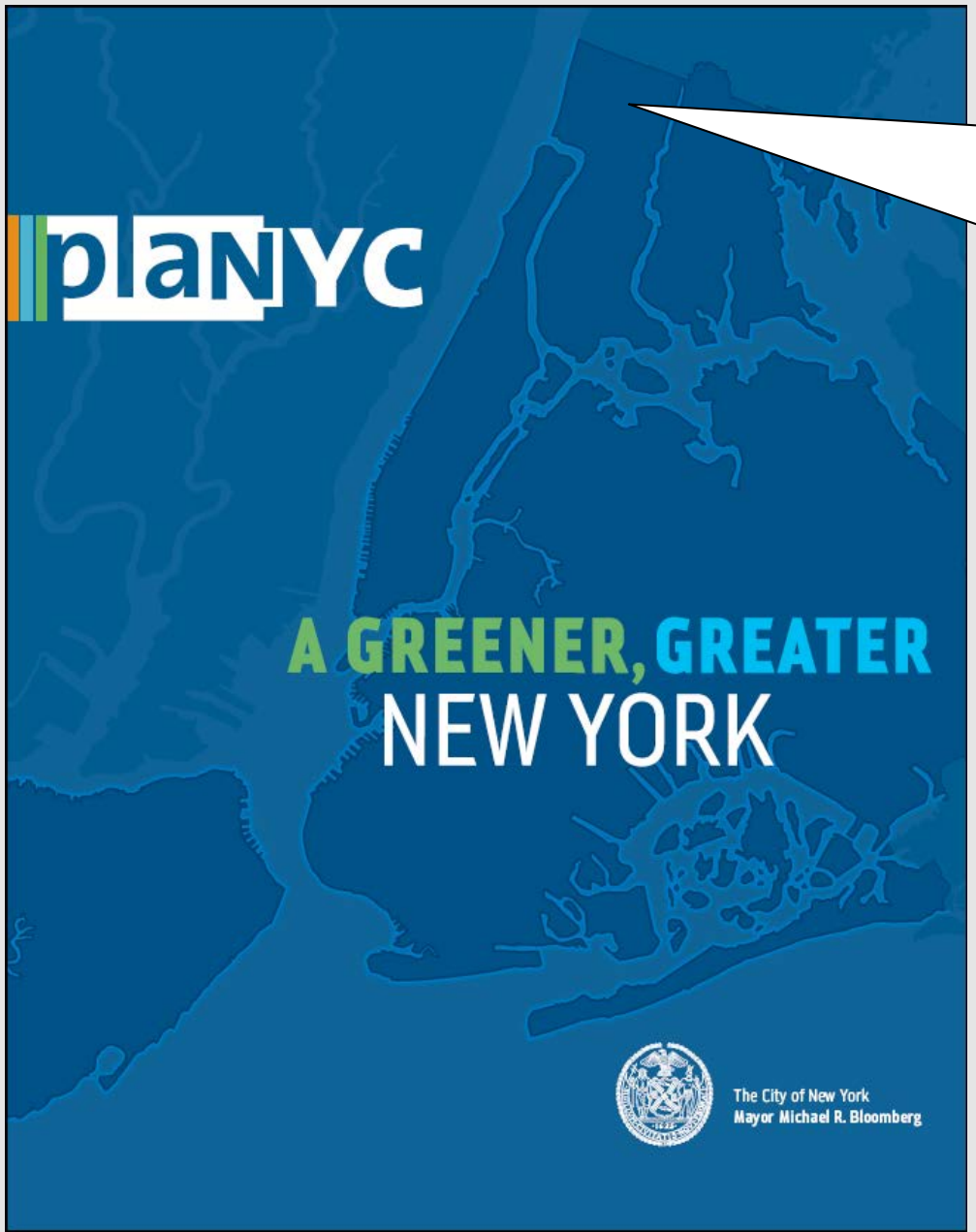
…or “How to maximize performance outcomes by bringing your learning strategy into the 21st Century.”

Presenters:
Michael Dipple, DCAS Energy Management
Michael Bobker, CUNY Building Performance Lab
Patrick Dail, CUNY School of Professional Studies

Agenda

- The City’s Energy Strategy context
- Objectives of the Building Operator program – Pedagogy & Content
  - Deciding what goes Online and what stays in the Classroom
- Demo selected program modules

PlaNYC is the City's sustainability roadmap.



10 Sustainability Goals

Hallmark of the Plan:
30% GHG emission reduction by 2017.

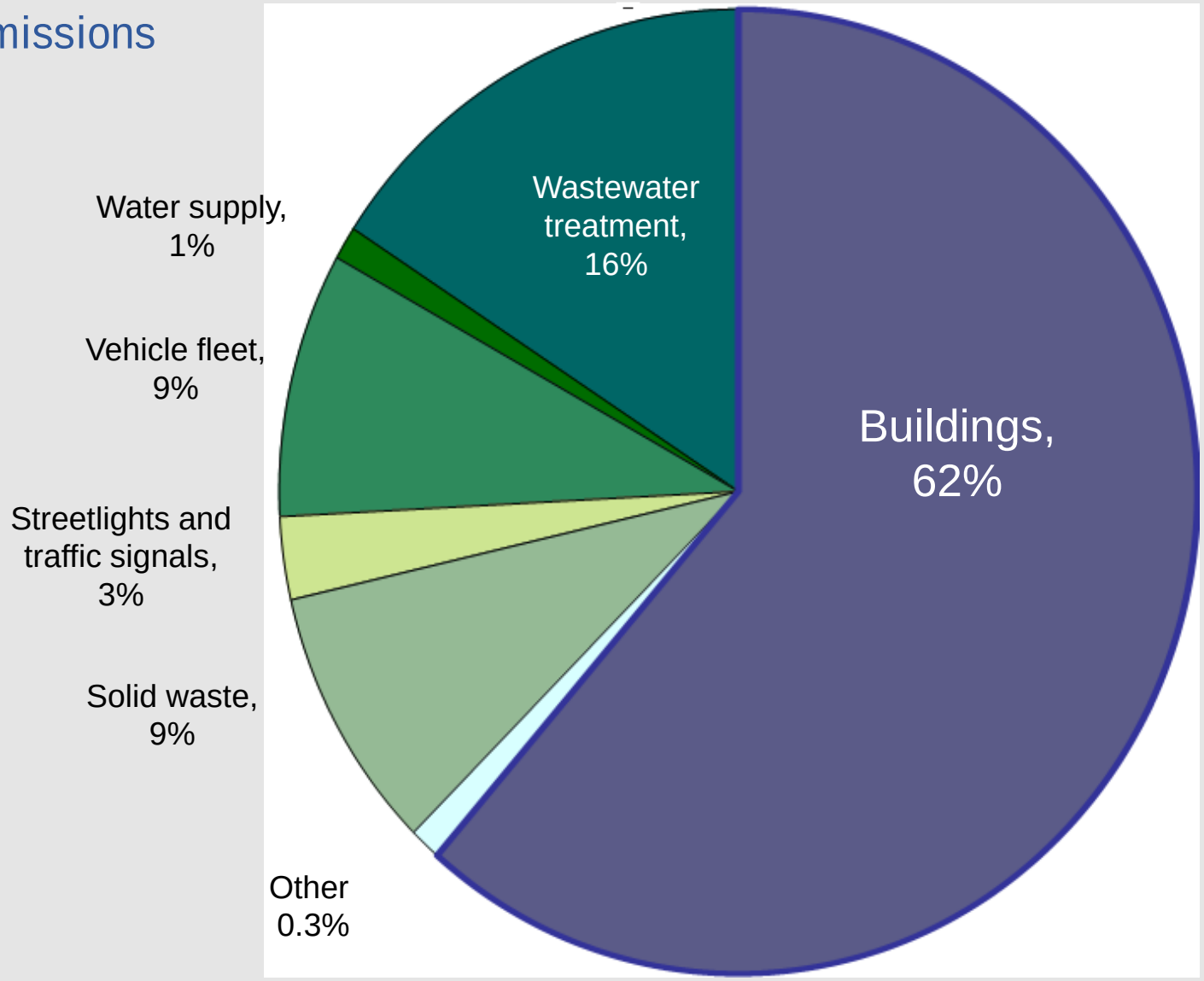
Going from PlaNYC To 30% x 2017 …

- Benchmarking
- Energy Audits & Retrofits
- Operations & Maintenance
- Training & Outreach
- Clean Distributed Generation

First step, investigate the City's emissions sources.

Source of City of New York Government GHG Emissions

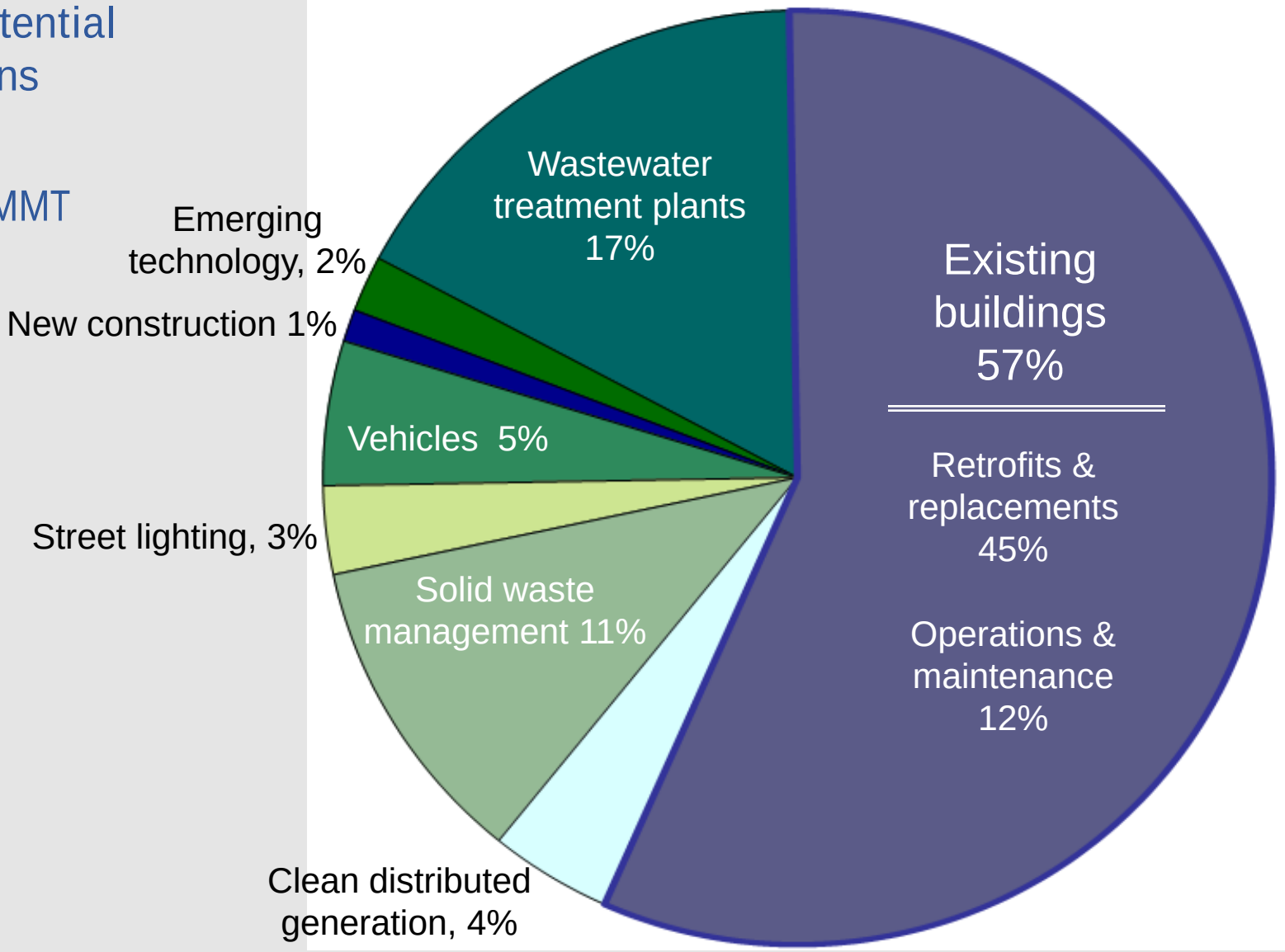
Total = 3.76 MMT



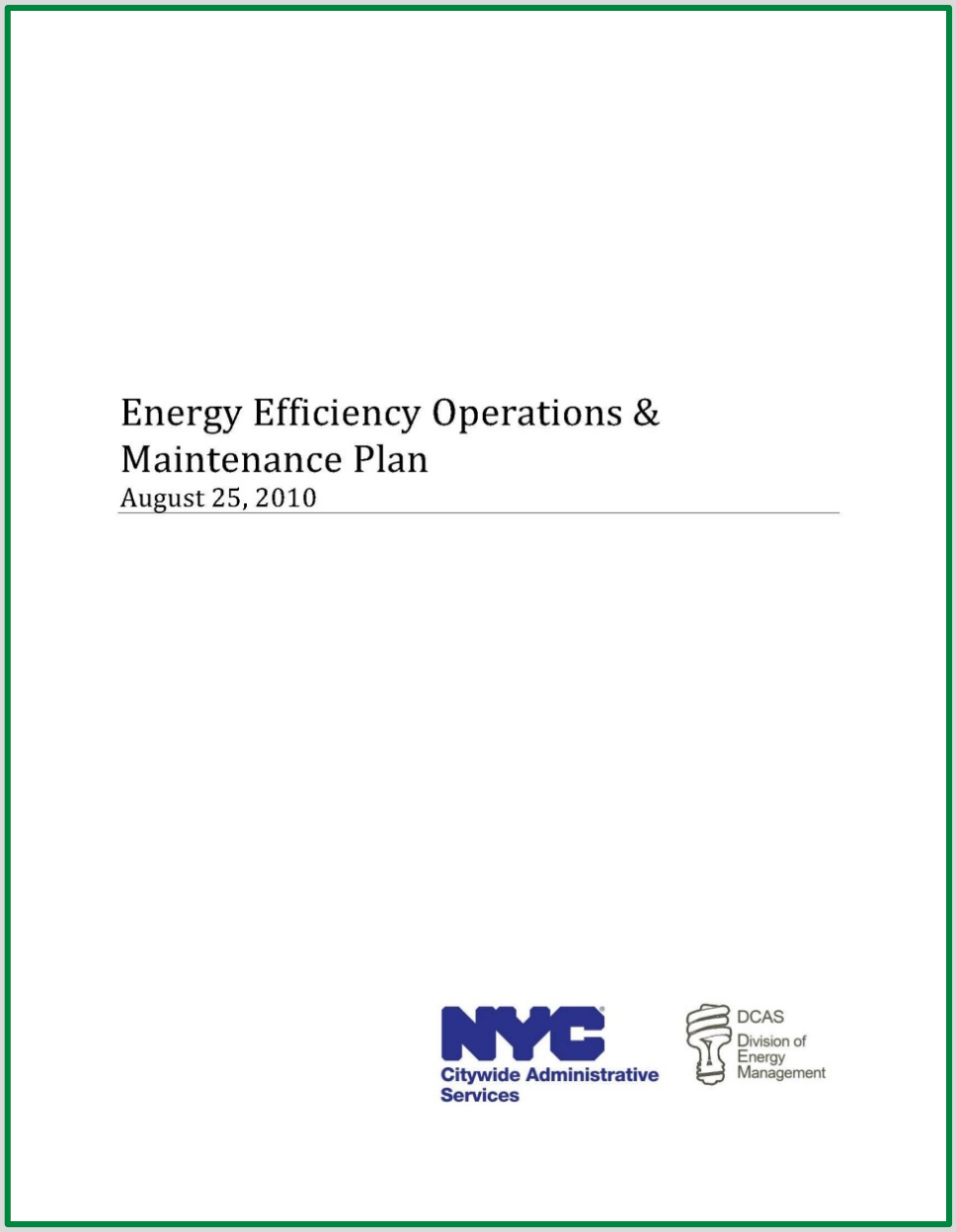
Next step, identify emissions reduction target areas.

Source of Potential GHG Emissions Reductions

Total = 1.68 MMT



DCAS Energy Management O&M Overview



Goals

1. Repair, maintain and operate existing equipment as efficiently as possible
2. Increase training and outreach to improve skills and raise energy awareness
3. Provide management oversight, accountability and transparency

What is hoped for from Operator training?

SUMMARY OF BUILDING OPERATOR CERTIFICATION PROGRAM EVALUATIONS

Submitted To:

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Director, Research and Evaluation
Consumers Energy
One Energy Plaza
Jackson, MI 49201

Submitted By:

research/into/action inc

EMI

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Goals

1. 10% - 15% energy savings from improved O&M
2. Training as one element in O&M program
3. Findings from evaluations of BOC training nationally - 2.5% ??

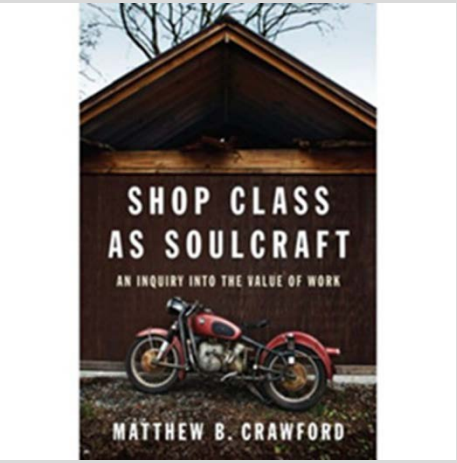
Table 3-5: Summary of BOC Program Level Savings Reported

Study	Net kWH Savings	Net MBtu Savings	Metric
NEEP_RLW_2005 – Non-schools	0.404	0.294	Per graduate per SqFt
NEEP_RLW_2005 – Schools	0.263	0.407	Per graduate per SqFt
KCPL_ODC_2009	0.02	0.0107	Per graduate per SqFt
NEEA_Navigant_2011	0.42		Per graduate per SqFt (a)
MEEA_MN_Navigant_2011	0.058	0.518	Per graduate per SqFt (and specified as O&M only)

a. Program savings of 2.5 % of facility energy consumption, assuming an energy intensity of 16.7 kWh/ft2, yielding an estimate of 0.42 kWh of savings per graduate per square foot. Study cites NEEA's analogous 2008 long-term market transformation study (conducted by Summit Blue, which was subsequently bought by Navigant) as supporting an estimate of 2.5% energy savings realized as a result of BOC certification.

Targeted Training Audience: Facility Operators

Greening the grizzly skeptic



Targeted Training Audience: Facility Operators

- Get more of engineering staff into classes
- Difficulty with taking shift stationary engineers off site
- Motivation for developing on-line lessons

Building Operator Certification-Level I

60 hour Training Program involving classroom lessons, practical projects and exams.

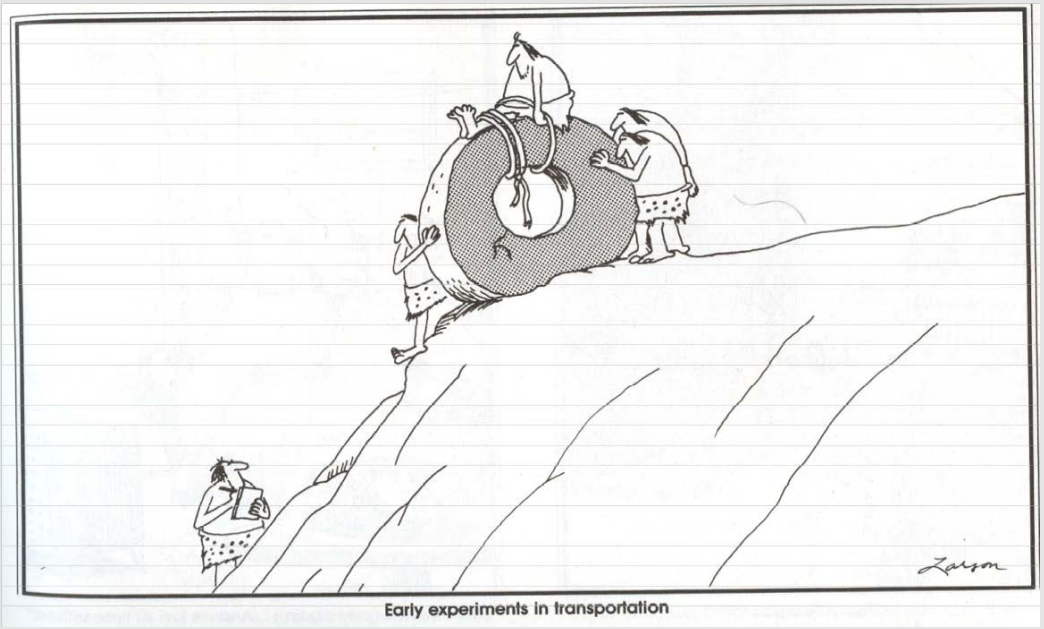
Primary Topics:

- HVAC Systems, Equipment and Controls
- HVAC Calculation and Retro-commissioning
- Electrical Systems and Equipment
- Energy Data and its use in Operations
- Energy Audits – participation, reading, and use
- Integrated Energy-related Maintenance Practice and development of operational projects

Building Operator Certification-Level I

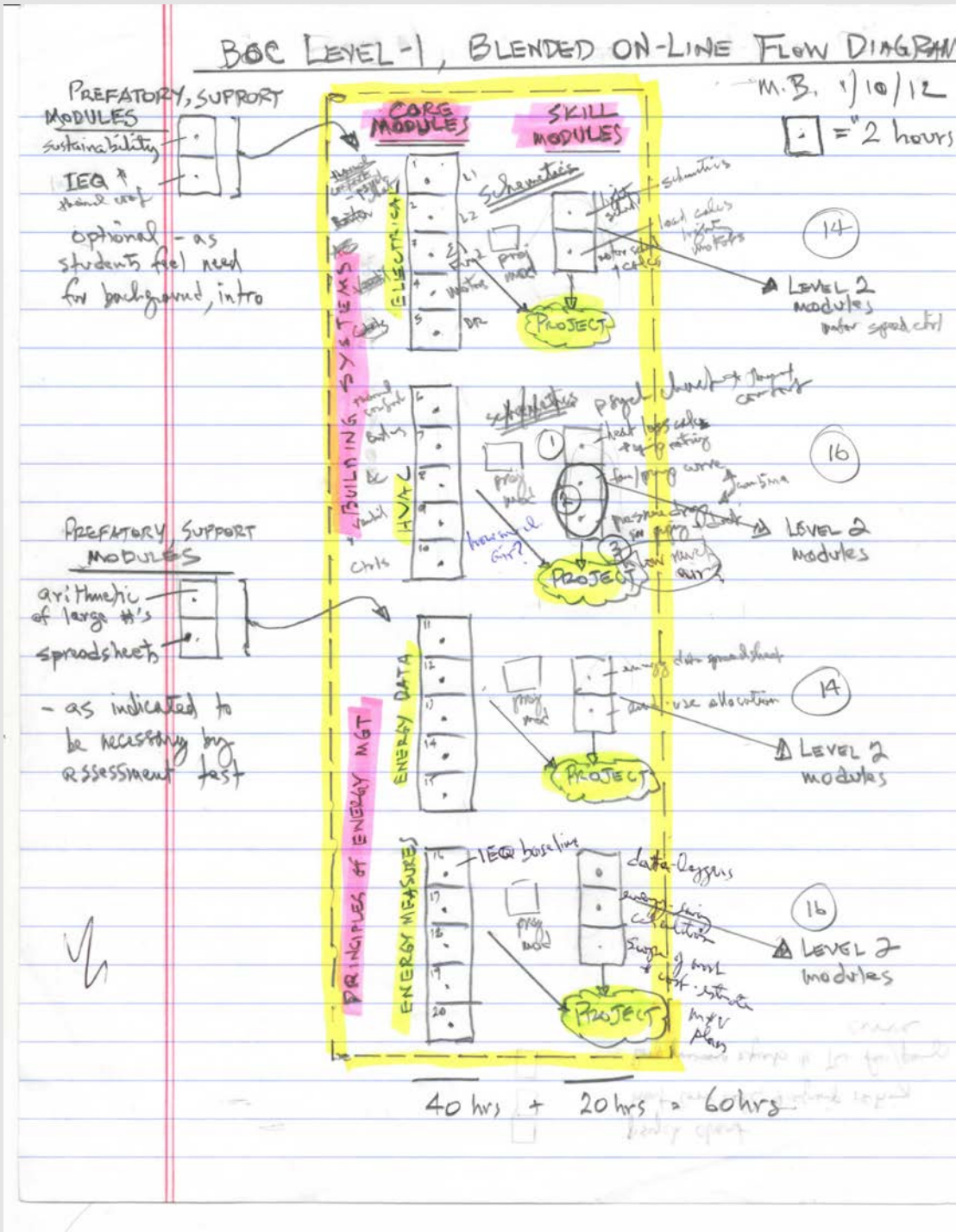
Pedagogy & Objectives

- Combine theory & practice
- Engage audience in professionalization & new mission
- Lead to measurable changes in facility operations



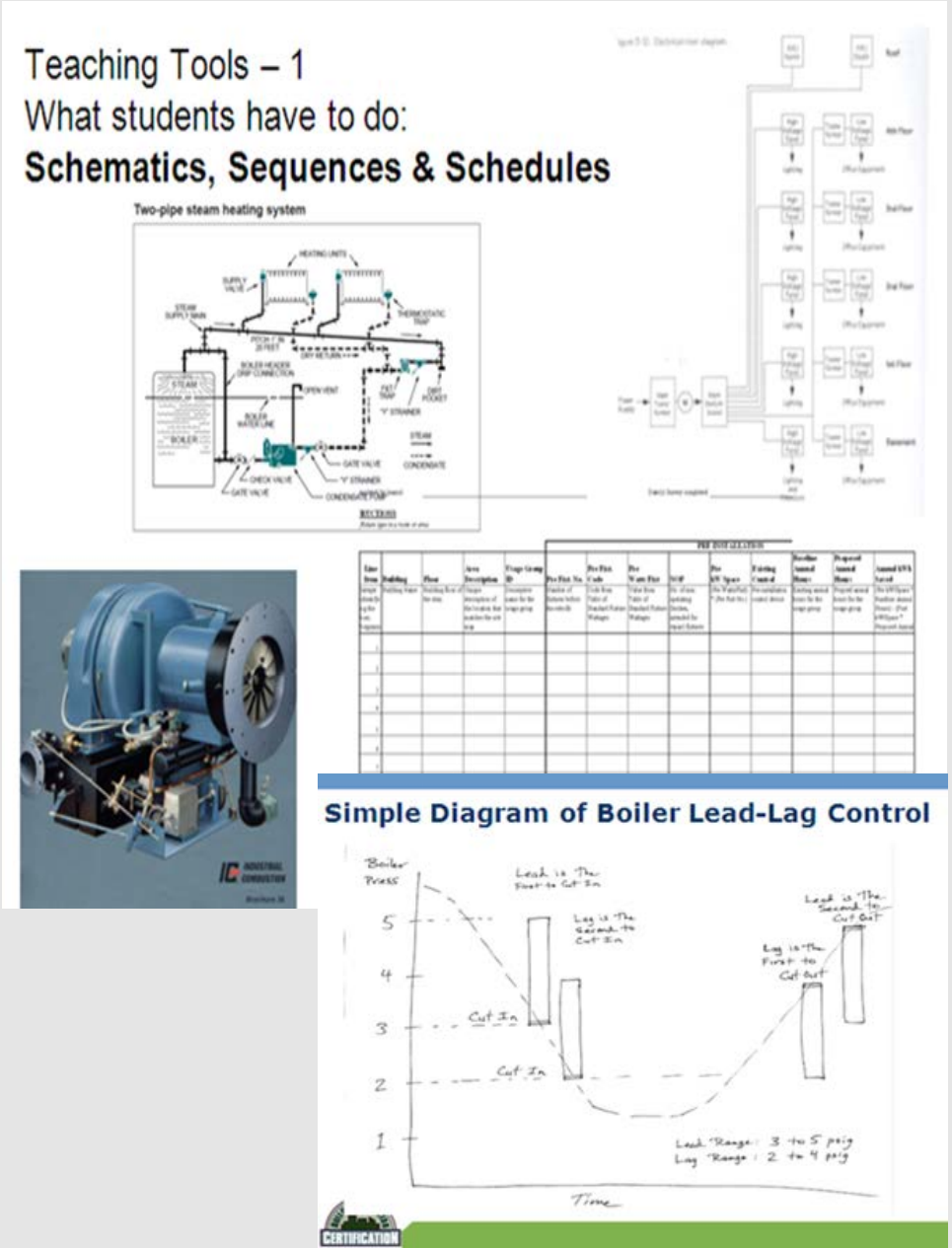
On-line vs In-class

- Separating pure content from skill/practice
- Apply content to real-world, work situations
- exercises
- Lead to PROJECTS in home facilities



Understand systems' operations

- Trace out equipment and **draw simple schematics**
- Sketching facilitates observation of equipment operations
- Instructor helps students
  - know what to look for
  - get started in drawing
  - Record relevant notes



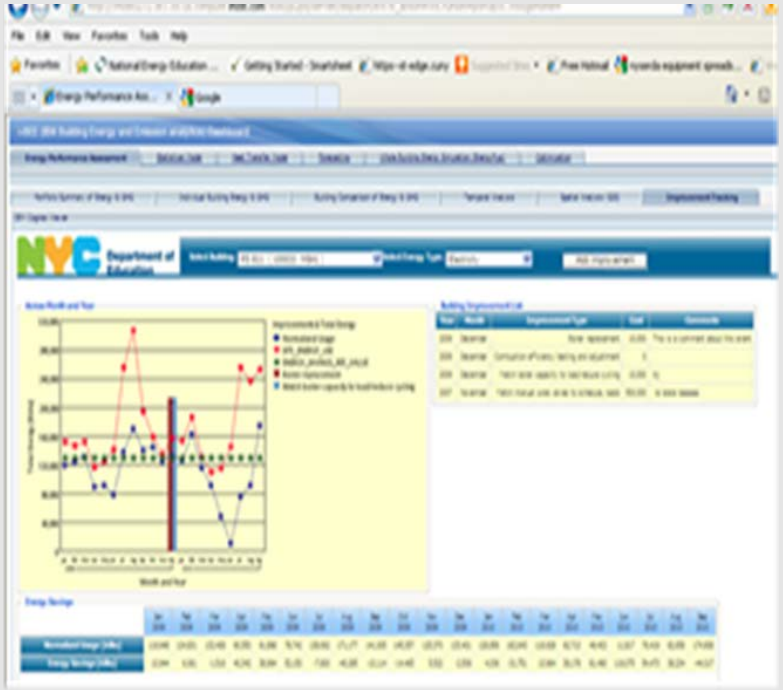
Collecting and using data, reading graphs

What data to collect for specific purposes?

- Thermal comfort
- Ventilation
- Lighting levels
- Electrical maintenance
- Energy use – absolute and relative

Use of hand-held tools & data-loggers

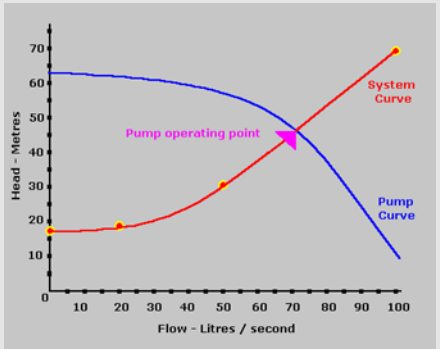
Use of computer (web) – based tools

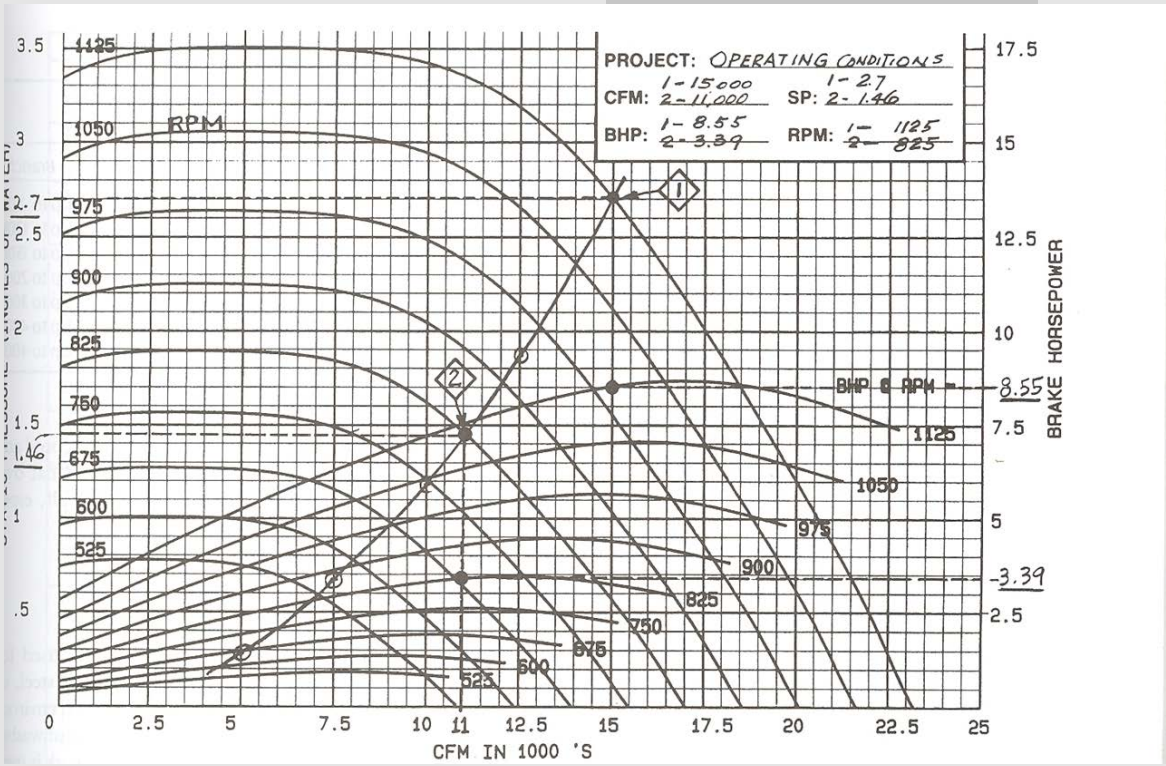


USE ENGINEERING TABLES AND CHARTS

Basic engineering concepts, such as flow and pressure relationship on pump/fan curves

Get operators over fear of basic calculations, unfamiliar methods for adjusting equipment





Resources to help your work:

PlaNYC – New York City's Sustainability Roadmap:
www.nyc.gov.planyc

CUNY Building Performance Lab:
http://www.cunybpl.org/

Deputy Commissioner Ariella Maron, podcast interview
www.greentechmedia.com

PlaNYC Case Study, C40 Cities Climate Leadership Group:
http://www.c40cities.org/

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