Big Changes in Lab Benchmarking
Learning Objectives

• Explain why benchmarking for lab buildings is more challenging than for most other types of facility.

• List some new features of the Lab Benchmarking Tool and describe how to use them to benchmark lab facilities.

• Describe the ways in which the Actionable Insights module helps to bridge the gap between benchmarking and action.

• Describe the ways in which the Portfolio Manager Connection module will help to grow the LBT’s database.
Outline

• Why and how we benchmark lab buildings
• Overview of the new Laboratory Benchmarking Tool and its even newer modules
• Where we’re going next and how to be a part of it
Why Benchmark Buildings?

• Prioritization
• Certification
• Contextualization
How to Benchmark Labs

• Diverse functional requirements
• Not covered by most benchmarking platforms
How We’ve Been Benchmarking Labs

The Lab21 dataset
150 buildings
5-10% of lab space in the US
Lab specific benchmarking

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The Key Team!

• Funding from FEMP (DOE)
• Designed and developed by LBNL, I²SL, the I²SL Laboratory Benchmarking Working Group, and kW Engineering
The Laboratory Benchmarking Tool

- Modern interface
- Updated fields
- More metrics
- More filters
- Still free to use!
The LBT: Examples

- Simple data entry
- Helpful help text
The LBT: Examples

Versatile charts

- Sorted column
- Scatter

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The LBT: Examples

Useful statistics

Histogram
But wait! There’s more.
Making Benchmarking Actionable

- **Actionable Insights Module**
  - Custom insights
  - Useful links
  - Sponsored by Siemens
  - Launched July 2019
Actionable Insights: Example 1

25,000 sf lab space
2 fume hoods

Fume Hoods

Low Average Fume Hood Density

It looks like your building has a low overall density of fume hoods. Effective energy efficiency strategies are more likely to focus on overall space ventilation rates, rather than fume hood controls or settings.
Actionable Insights: Example 2

**DDC control system**
- No night setbacks
- No static pressure reset
- Heat pipe exhaust air heat recovery

**Supply Duct Static Pressure Setpoint Reset**
You indicated that your building is equipped with DDC controls and does not use supply static pressure reset controls. Consider implementing *demand-based static pressure reset controls on the air supply systems* at your facility. These save energy by using feedback from the zones (straightforward with a DDC control system) to reduce the supply fan static pressure to only what is needed for current conditions. A number of *important caveats* exist for lab facilities:

- Some common laboratory terminal control unit types (most venturi valves) do not natively provide a "damper feedback" signal and so this measure cannot be applied in its typical form at those facilities.
- For spaces with VAV fume hoods, conditions may change rapidly — more rapidly than typical zone-level polling — and so it’s important to make sure that the supply air system can respond quickly enough to maintain proper space pressurization as hood airflows vary.
- This ASHRAE Journal article includes some helpful ideas.

**Plus:**
- Your HVAC Control System (DDC)
- Unoccupied Minimum Airflow Setbacks
- Energy Recovery: Controls RCx
- Automated Fault Detection and Diagnostics
Actionable Insights: Example 3

Low fume hood density
10 ACH min in labs
Making Benchmarking More Convenient

- Portfolio Manager Connection module
  - Connect to ENERGY STAR® PortfolioManager® buildings
  - Automatic data importing
  - Funded by LBNL/FEMP
  - Launched Oct 2019

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Where we’re going...
A Community Tool

• Crowdsourced database
• More user data means better benchmarking for everyone

• ... plus new capabilities!

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Energy Scores

• Energy scores are useful!
  • One-stop benchmarking
  • Easy to obtain
  • Easy to report

• Pilot score developed using Boston-area data
  • Need more data to extend nationwide...

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Beyond Energy Benchmarking

- Catalyze conversation and action
- Establish industry standard practice
- More operational practices data needed to build out database...
Questions?

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