Smart Labs: Connecting Higher Education and Healthcare for Innovative Energy Solutions

Smart Labs for Higher Education & Healthcare

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Federal Energy Management Program

DOE Building Technologies Office, Systems Integration R&D Portfolio with Commercial Buildings Integration

FEMP Federal Energy Management Program

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY BUILDING TECHNOLOGIES OFFICE

BACKGROUND

- Laboratories are energy-intensive spaces, which **consume 3 to 4 times (and sometimes up to 10 times)** more than the amount of energy of a typical office building.
- Higher education and healthcare sectors frequently **prioritize sustainability and decarbonization**, where research labs are a key focus to meet emissions reductions goals.
- The Smart Labs program plays a crucial role partnering with institutions to **share best practices** for improving energy efficiency and safety while reducing the environmental impact of laboratories.
- Resources provided by the Smart Labs program can lead to **reduction in building energy loads** and help overcome barriers to implementing decarbonization measures.

PROJECT OVERVIEW / OBJECTIVES

The University and Healthcare working group empowers staff to achieve energy and emissions reduction goals in labs by implementing safe, cost-effective solutions. Through DOE's Building Technologies Office (BTO), the group meets to:

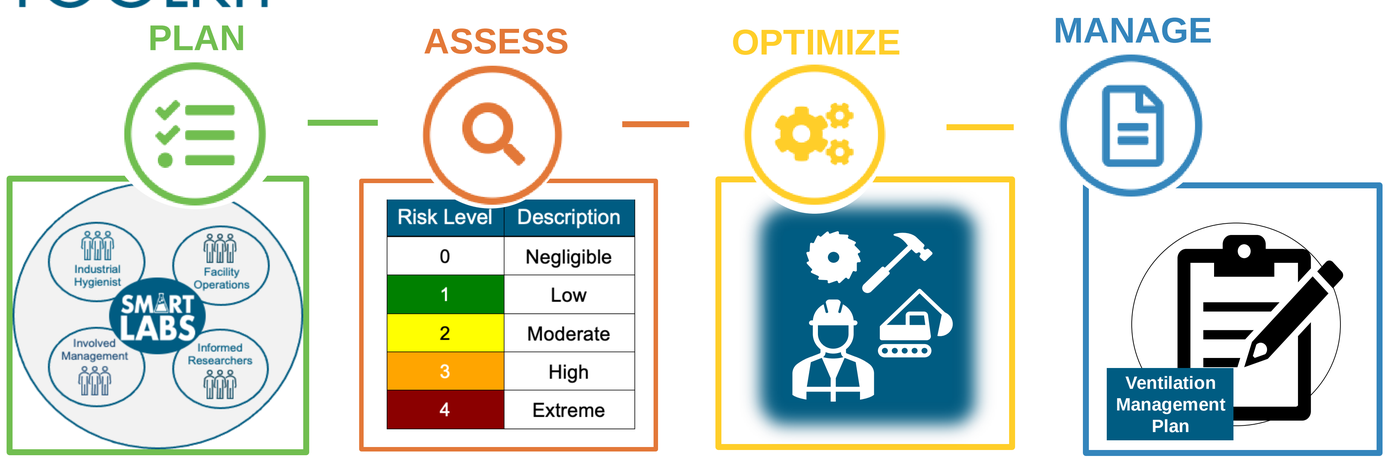
- ☑ Learn about Smart Labs principles
- ☑ Collaborate on best practices
- ☑ Align safety with efficiency
- ☑ Improve ventilation effectiveness
- ☑ Perform ventilation risk assessments
- ☑ Institute dynamic management plans

[1] Lindoerfer, Brian. "University of Colorado Boulder Climate Action Plan." Presented at Colorado Net Zero Campus Forum. February 15, 2024.

At one university campus, research labs occupy only 11% of campus square footage but consume a staggering 42% of total energy use.[1]

SMART LABS TOOLKIT

Best practices in laboratory design and operation are shared on the Smart Labs Toolkit. Designed to help institutions **improve energy efficiency and safety** in laboratory environments, the toolkit offers a systematic approach.



Toolkit resources to support the successful implementation of a Smart Labs program include:

- Partner case studies.
- Step-by-step guidance.
- User friendly tools.
- Helpful templates.
- Best practice guides.

Smart Labs Toolkit

Best practices include:

- Form a team of lab stakeholders, including a champion.
- Complete the laboratory ventilation risk assessment.
- Implement a lab ventilation management plan.
- Work with researchers.

OUTCOMES AND IMPACTS

- **Implementation of Programs**: Many universities and healthcare partners have successfully initiated a My Green Labs (sustainability in research) or Smart Labs (energy and emissions reductions in operations) type program: **52% of partners** have already implemented a program in their laboratories.
- **Active Engagement**: First year of regular quarterly meetings yielded an average of **42 attendees** per meeting.
- **Growing Partnerships**: In just one year, the Smart Labs University and Healthcare working group had expanded to include over **200 partners**.

Example Partners include:

Anschutz | Michigan State University | California State Dominguez Hills | University of Virginia | University of Michigan

FUTURE WORK

- **Lead the Labs Industry**: Continue to develop and document best practices, including those in unique applications like modular labs.
- **Diverse Backgrounds**: Serve a diverse organizations (e.g. small, large, urban, rural, etc) with diverse backgrounds (e.g. facility manager, safety professional, etc) which requires innovative approaches to engagement.
- **Sector-Specific Needs**: Understand the unique needs of healthcare laboratories and tailor solutions to this growing sector.
- **In-Person Networking**: In-person meet-ups at events enhance connections, providing valuable insights into group needs and fostering stronger relationships.

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