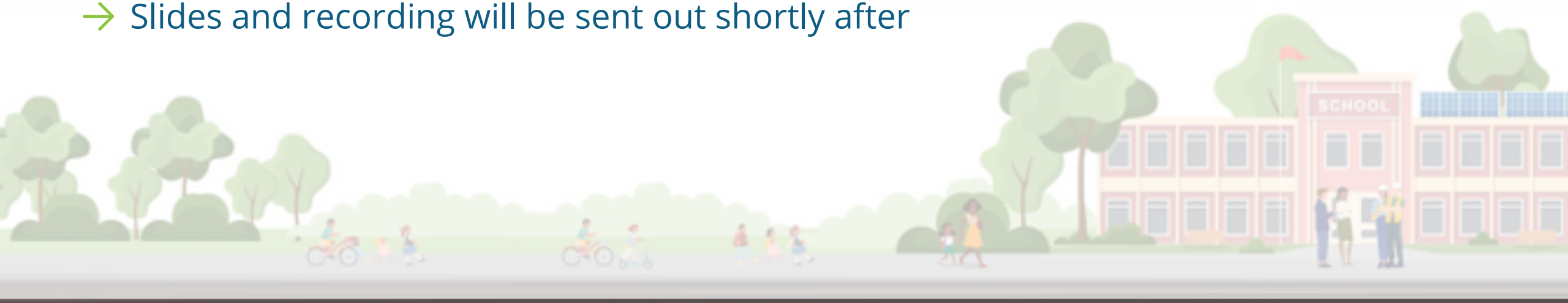
2023-2024 Efficient and Healthy Schools Program

Recognition Program Cohort - Retrofit Revolutionary & Performance Pro

EFFICIENT AND HEALTHY SCHOOLS

Welcome!

- Session is being recorded
- Please stay muted until Q&A at the end
- Introduce yourself and enter questions in the chat!
- Slides and recording will be sent out shortly after



Agenda

1. 2023-2024 Efficient and Healthy Schools Program
2. EHSP Resources Overview
3. Retrofit Revolutionary Example - Maine Township SD
4. Performance Pro Example - Boise SD
5. Question & Answer

Today's Presenters

Reilly Loveland
New Buildings Institute

Mischa Egolf
New Buildings Institute

Bob St. Mary
Elara Engineering

Peter Therkelsen
US DOE 50001Ready Program

Alison Ward
Boise School District

The Efficient and Healthy Schools Program Team

U.S. Department of Energy



Berkeley Lab






New Buildings Institute





2023-2024 Efficient and Healthy Schools Program

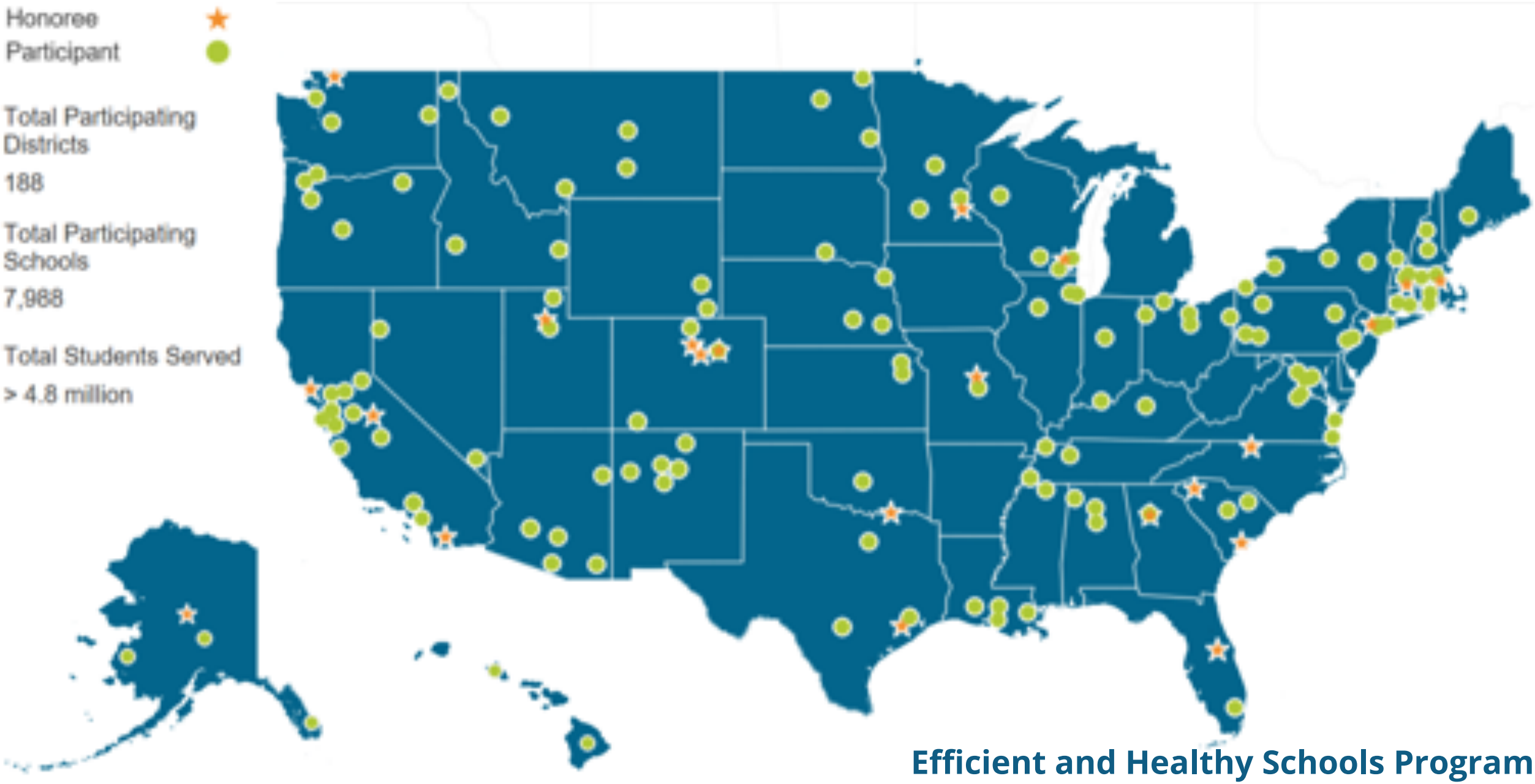
Reilly Loveland
New Buildings Institute

DOE Efficient and Healthy Schools Program

Aims to improve energy performance, advance resilience, and promote a **healthy learning environment** in schools.

Engages **K-12 schools,** especially those serving low-income student populations and in rural areas.

Provides **technical assistance** through direct consultations and **recognition** of exemplary school improvements.



Efficient and Healthy Schools Program Participants to date – February 2024

Three ways to get involved

Join the Program

- National support network of best practices
- FREE Technical Assistance
- One-on-one onboarding

Support Schools

- Engage with active schools and districts
- Be listed on program website
- National network of leading organizations

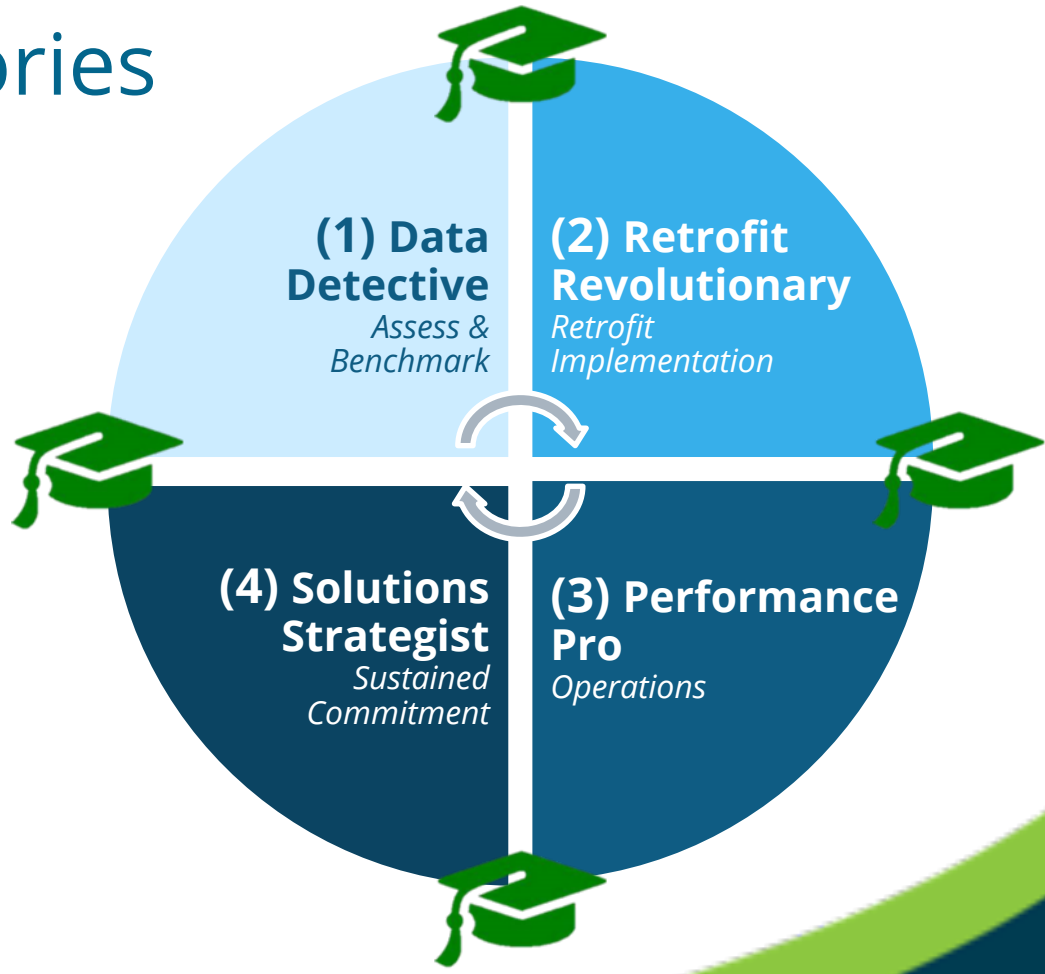
Gain Recognition

- National recognition
- Free Technical Assistance
- Onboarding and coaching

2023-2024 Recognition Categories

All Categories Offered

- Direct Technical Assistance menu administered by LBNL & NBI
- Peer-Peer learning in cohorts of districts facilitated by NBI
- Mentorship from previous honorees
- Financing & funding development
- Packaged resource sharing by NBI



Preparation

Interested schools and districts will fill out a recognition application and request assistance from the program if needed.

Winter 2023-2024

Announcement & Celebration

Schools and districts will be notified of recognition in April and will be invited to attend an in-person celebration in June 2024.

May-June 2024

April 2024

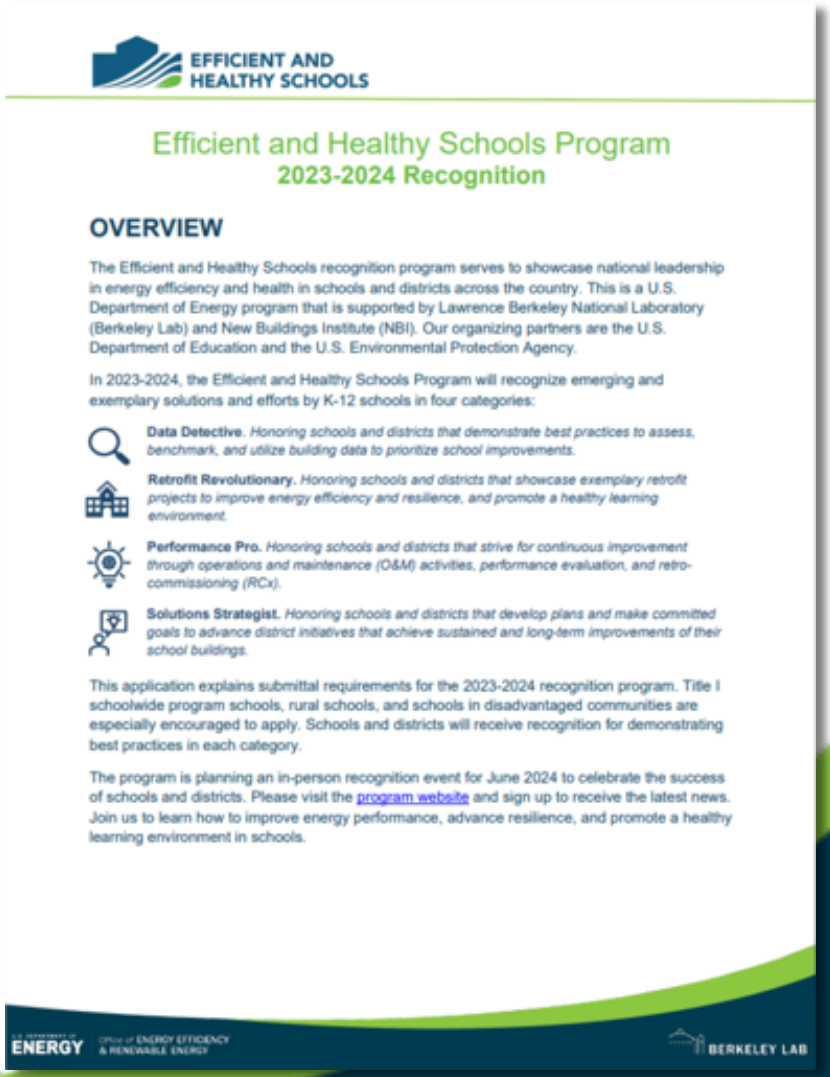
Final Submission

Schools and districts will submit application and supporting materials by April 5, 2024.

Recognition Application Overview

- Submit via online form:

  https://www.surveymonkey.com/r/6Y6TL69
- Start and return later
  - Complete each section with draft language
  - Submit survey, you'll receive and email with a link to return and edit
  - Editing will close on the due date of the application
- PDF guide is available for download
  - *We'll put this in the chat now too!*



EFFICIENT AND HEALTHY SCHOOLS

Efficient and Healthy Schools Program

2023-2024 Recognition

OVERVIEW

The Efficient and Healthy Schools recognition program serves to showcase national leadership in energy efficiency and health in schools and districts across the country. This is a U.S. Department of Energy program that is supported by Lawrence Berkeley National Laboratory (Berkeley Lab) and New Buildings Institute (NBI). Our organizing partners are the U.S. Department of Education and the U.S. Environmental Protection Agency.

In 2023-2024, the Efficient and Healthy Schools Program will recognize emerging and exemplary solutions and efforts by K-12 schools in four categories:

Data Detective. *Honoring schools and districts that demonstrate best practices to assess, benchmark, and utilize building data to prioritize school improvements.*

Retrofit Revolutionary. *Honoring schools and districts that showcase exemplary retrofit projects to improve energy efficiency and resilience, and promote a healthy learning environment.*

Performance Pro. *Honoring schools and districts that strive for continuous improvement through operations and maintenance (O&M) activities, performance evaluation, and retro-commissioning (RCx).*

Solutions Strategist. *Honoring schools and districts that develop plans and make committed goals to advance district initiatives that achieve sustained and long-term improvements of their school buildings.*

This application explains submittal requirements for the 2023-2024 recognition program. Title I schoolwide program schools, rural schools, and schools in disadvantaged communities are especially encouraged to apply. Schools and districts will receive recognition for demonstrating best practices in each category.

The program is planning an in-person recognition event for June 2024 to celebrate the success of schools and districts. Please visit the program website and sign up to receive the latest news. Join us to learn how to improve energy performance, advance resilience, and promote a healthy learning environment in schools.

ENERGY Office of ENERGY EFFICIENCY & RENEWABLE ENERGY BERKELEY LAB

Training Opportunity by LBNL / BEST Center

CONTEMPORARY CONTROLS

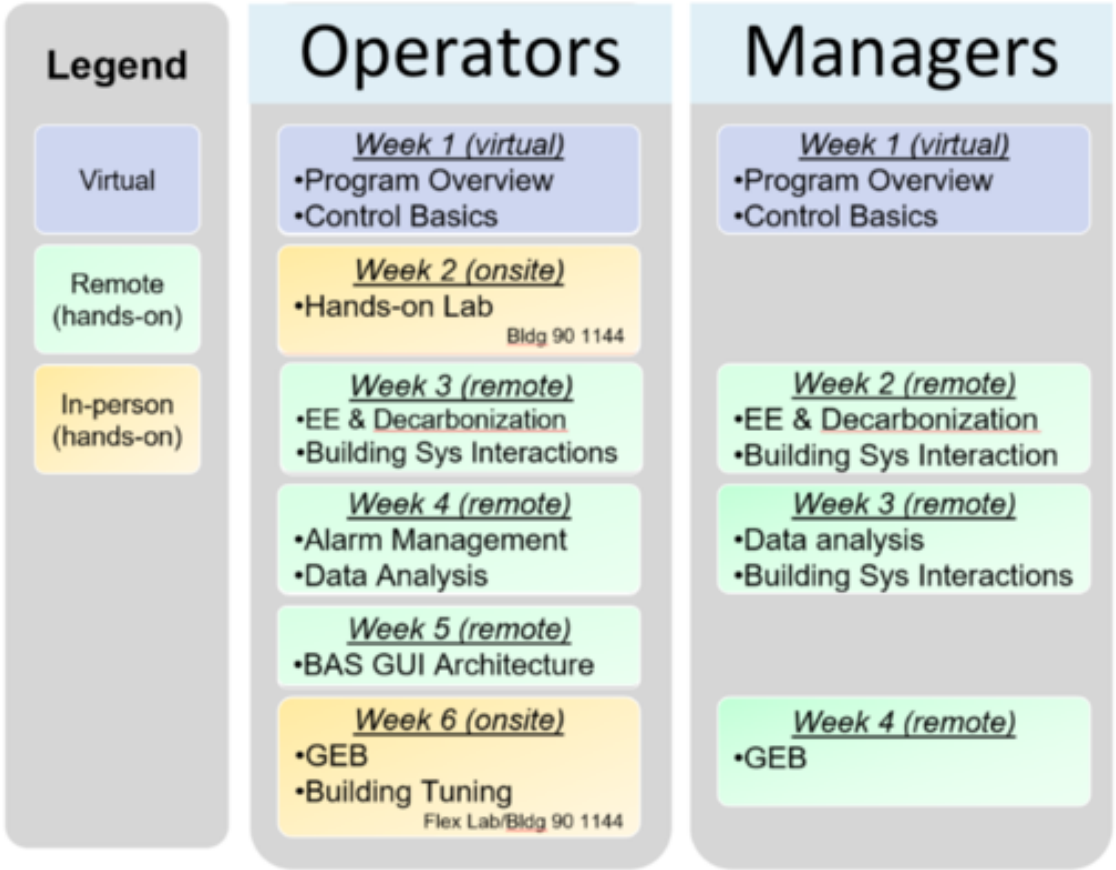
Using Building Automation System (BAS) for Efficient & Improved Operations

- Learn how to use BAS for troubleshooting, improve efficiency and save energy cost
- A professional development program uniquely designed for Facility Managers and Building Engineers with forward thinking concepts and lots of **hands-on** practices
- Leverages LBNL's FLEXLAB® (https://flexlab.lbl.gov/) facility to achieve an in-depth, lab-based learning experience

BEST
Building Efficiency for a Sustainable Tomorrow

BERKELEY LAB

Training Groups & Timeline



Facility Managers

***Online only training**, 16 hours total, March 22-April 12, 2024); 24 spots*

Fridays over 4 weeks.

Building Engineers

***Online and In-person**, 62 hours total, April 26-June 14, 2024; 24 spots*

Presentations, discussions, and hands-on labs will be held over 6 weeks, including five days of in-person activities at LBNL in Berkeley, CA.

Register Here!

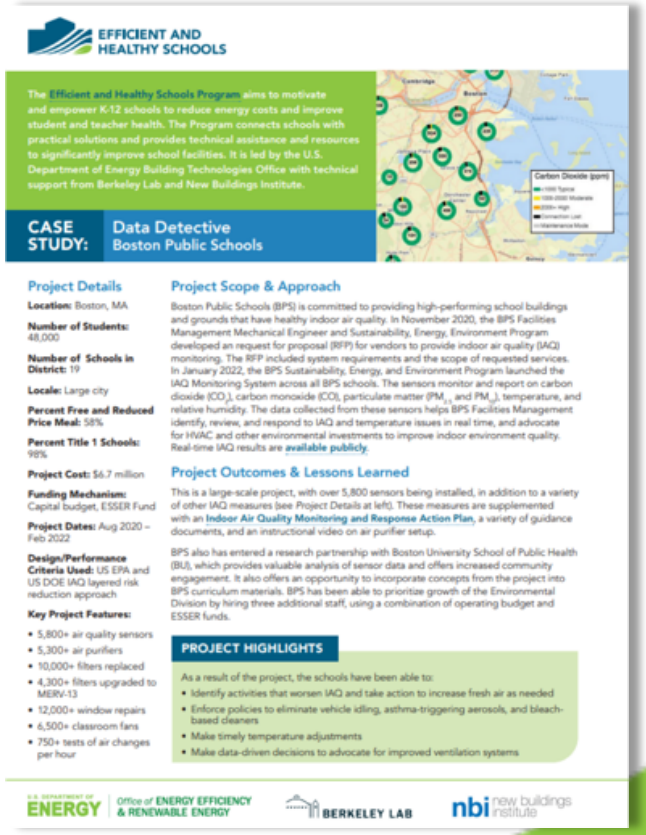
EHSP Resources

Mischa Egolf
New Buildings Institute

https://efficienthealthyschools.lbl.gov/resources

Case studies

- Efficient Healthy Schools Program Honorees:
  - Examples for each category:
    2023/2024 Recognition
  - Previous winners for inspiration:
    2022/2023 Recognition



EFFICIENT AND HEALTHY SCHOOLS

The Efficient and Healthy Schools Program aims to motivate and empower K-12 schools to reduce energy costs and improve student and teacher health. The Program connects schools with practical solutions and provides technical assistance and resources to significantly improve school facilities. It is led by the U.S. Department of Energy Building Technologies Office with technical support from Berkeley Lab and New Buildings Institute.

CASE STUDY: Data Detective
Boston Public Schools

Project Details

Location: Boston, MA

Number of Students: 48,000

Number of Schools in District: 19

Locale: Large city

Percent Free and Reduced Price Meal: 58%

Percent Title 1 Schools: 98%

Project Cost: $6.7 million

Funding Mechanism: Capital budget, ESSER Fund

Project Dates: Aug 2020 – Feb 2022

Design/Performance Criteria Used: US EPA and US DOE IAQ layered risk reduction approach

Key Project Features:

- 5,800+ air quality sensors
- 5,300+ air purifiers
- 10,000+ filters replaced
- 4,300+ filters upgraded to MERV-13
- 12,000+ window repairs
- 6,500+ classroom fans
- 750+ tests of air changes per hour

Project Scope & Approach

Boston Public Schools (BPS) is committed to providing high-performing school buildings and grounds that have healthy indoor air quality. In November 2020, the BPS Facilities Management Mechanical Engineer and Sustainability, Energy, Environment Program developed an request for proposal (RFP) for vendors to provide indoor air quality (IAQ) monitoring. The RFP included system requirements and the scope of requested services. In January 2022, the BPS Sustainability, Energy, and Environment Program launched the IAQ Monitoring System across all BPS schools. The sensors monitor and report on carbon dioxide (CO_2), carbon monoxide (CO), particulate matter ($PM_{2.5}$ and PM_{10}), temperature, and relative humidity. The data collected from these sensors helps BPS Facilities Management identify, review, and respond to IAQ and temperature issues in real time, and advocate for HVAC and other environmental investments to improve indoor environment quality. Real-time IAQ results are available publicly.

Project Outcomes & Lessons Learned

This is a large-scale project, with over 5,800 sensors being installed, in addition to a variety of other IAQ measures (see Project Details at left). These measures are supplemented with an Indoor Air Quality Monitoring and Response Action Plan, a variety of guidance documents, and an instructional video on air purifier setup.

BPS also has entered a research partnership with Boston University School of Public Health (BU), which provides valuable analysis of sensor data and offers increased community engagement. It also offers an opportunity to incorporate concepts from the project into BPS curriculum materials. BPS has been able to prioritize growth of the Environmental Division by hiring three additional staff, using a combination of operating budget and ESSER funds.

PROJECT HIGHLIGHTS

As a result of the project, the schools have been able to:

- Identify activities that worsen IAQ and take action to increase fresh air as needed
- Enforce policies to eliminate vehicle idling, asthma-triggering aerosols, and bleach-based cleaners
- Make timely temperature adjustments
- Make data-driven decisions to advocate for improved ventilation systems

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY | BERKELEY LAB | nbi new buildings institute

Today's Focus

Data Detective. Honoring schools and districts who demonstrate best practices to assess, benchmark, and utilize building data to prioritize school improvements.

Retrofit Revolutionary. Honoring schools and districts that showcase exemplary retrofit projects to improve energy efficiency and resilience, and to promote a healthy learning environment.

Healthy retrofits

Performance Pro. Honoring schools and districts who strive for continuous improvement through operations and maintenance (O&M) activities, performance evaluation, and retrocommissioning (RCx).

Operations & maintenance

Solutions Strategist. Honoring schools and districts that develop plans and make committed goals to advance district initiatives that achieve sustained and long-term improvements of their school buildings.

Relevant Topic Areas

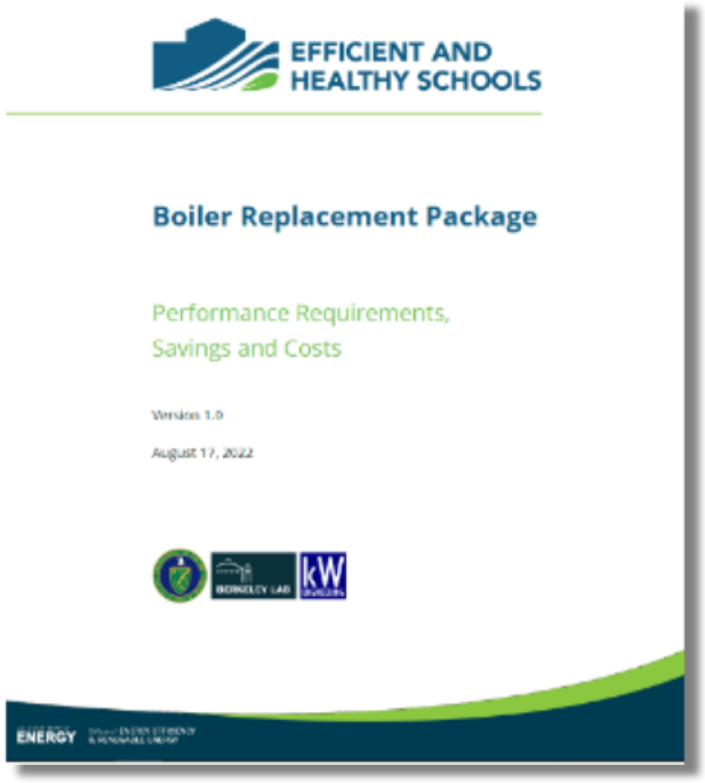
Retrofit Revolutionary:

- System-specific upgrades (HVAC, controls, lighting)
- Decarbonization-focused retrofits
- Retrofit design and contracting
- Commissioning (Cx) and retrocommissioning (RCx)

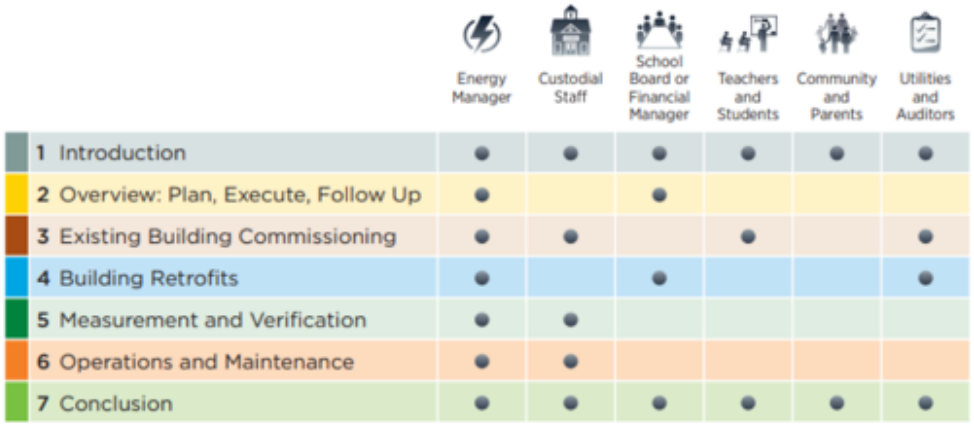
Performance Pro:

- Operations and Maintenance (O&M) practices
- Performance measurement and verification (M&V)
- Workforce training

Example Resources



Advanced Energy Retrofit Guide



	Energy Manager	Custodial Staff	School Board or Financial Manager	Teachers and Students	Community and Parents	Utilities and Auditors
1 Introduction	●	●	●	●	●	●
2 Overview: Plan, Execute, Follow Up	●		●			
3 Existing Building Commissioning	●	●		●		●
4 Building Retrofits	●		●			●
5 Measurement and Verification	●	●				
6 Operations and Maintenance	●	●				
7 Conclusion	●	●	●	●	●	●

Figure 1-3 Relevant sections for K-12 school stakeholders

HVAC Replacement Package Guides

We are here to help!

- 1:1 coaching
- Connect with partnering agencies and subject matter experts
- Provide tailored resources

Maine Township District 207 - Retrofit Revolutionary Example

Bob St. Mary
Elara Engineering

ELARA ENGINEERING

MTHSD207 Facility Master Plan Projects

Robert St. Mary – Senior Project Engineer

ELARA BACKGROUND

About Us

ELARA ENGINEERING PHILOSOPHY

Big Picture Thinking. Practical Approach. Sustainable Design.

- Investigate each project's effect on the *entire* facility or campus
- Embody a "contractor's view" to ensure design solutions, even innovative ones, are constructible and maintainable
    - Phase projects to meet budgets
- Design for best long-term investment.
    - A sustainable design is practical, constructible, right-sized, holistic, and long-term

NOTABLE ACHIEVEMENTS

Recipient of numerous engineering awards

- 37 ASHRAE (27 Local, 6 Regional & 4 International)
- IREM
- USGBC
- Energy Star

LEED Projects

- 23 Platinum, Gold, Silver, Certified

Over $8.0MM in incentives procured for our clients

MTHSD 207

Background

HIGH SCHOOL DISTRICT (DES PLAINES & PARK RIDGE, IL)

Maine East High School

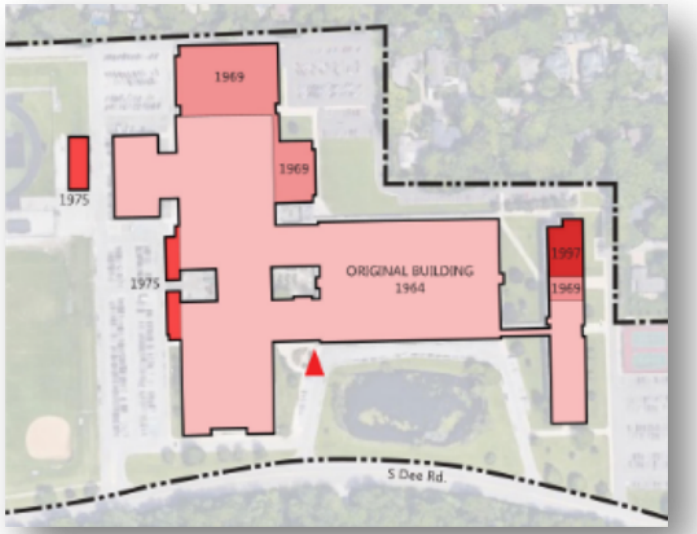
- Constructed in 1929 (oldest facility)
- Several additions over the years
- 496,000 SF

Maine South High School

- Constructed in 1964 (youngest facility)
- Several additions over the years
- 471,400 SF

Maine West High School

- Constructed in 1959
- Several additions over the years
- 461,600 SF



Maine East High School

Maine East High School

MAINE EAST HIGH SCHOOL

MEP

- Hodge podge of existing system types
  - Unit Ventilators (2-pipe and 4-pipe)
  - RTUs
  - AHUs
  - Absorption Chillers
  - Steam boilers
- Significant amount of aged equipment
- Some existing areas without space cooling
- Predominantly existing T8 & T12 fluorescent light fixtures

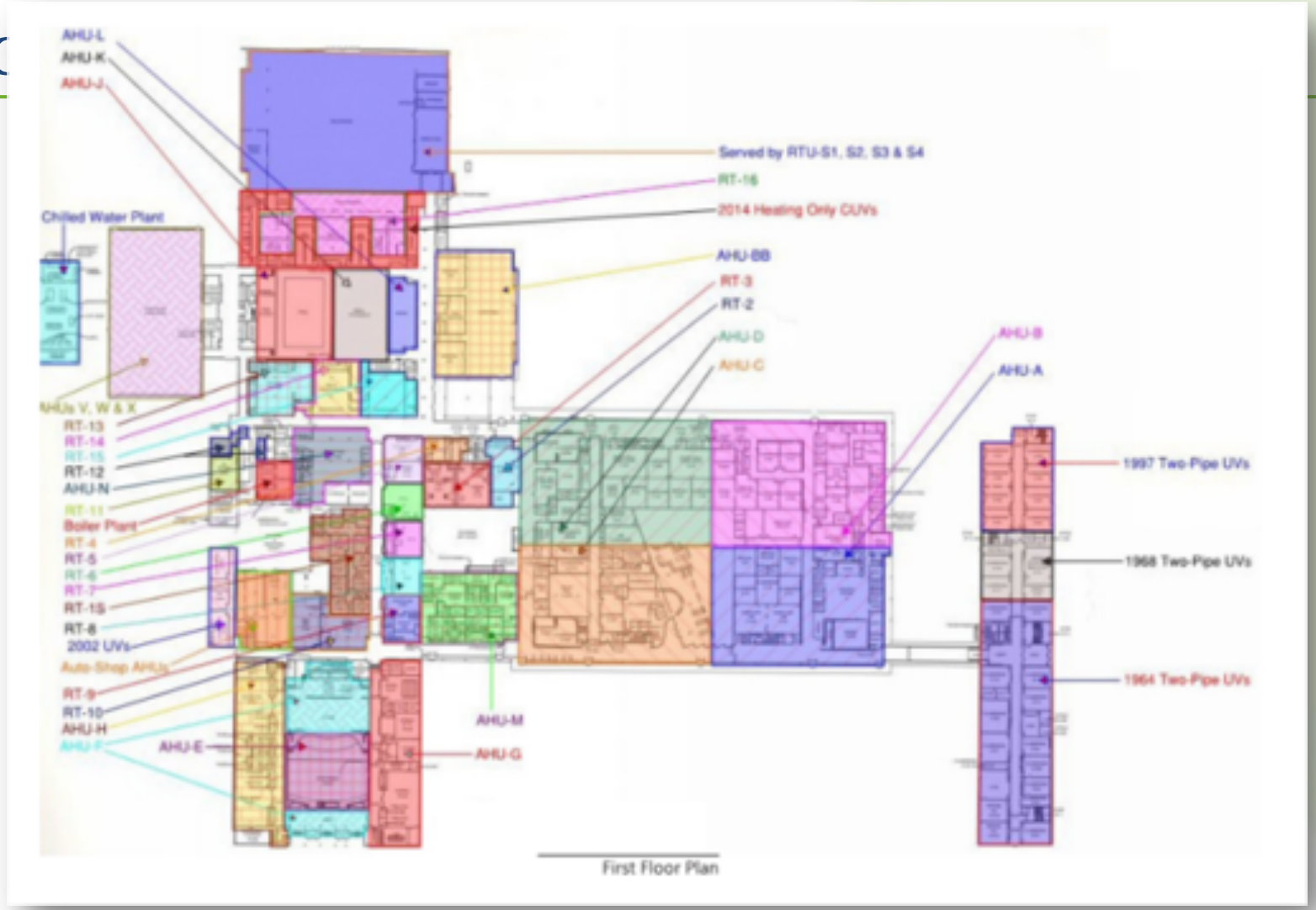
Maine South High School

Maine South High School

MAINE SOUTH HIGH SCHO

MEP

- Hodge podge of existing system types
  - Unit Ventilators (2-pipe)
  - RTUs
  - AHUs
  - Electric Chillers
- Significant amount of aged equipment
- Some existing areas without space cooling
- Predominantly existing T8 fluorescent light fixtures
- Boiler plant recently replaced and converted to hot water as part of a separate Elara project



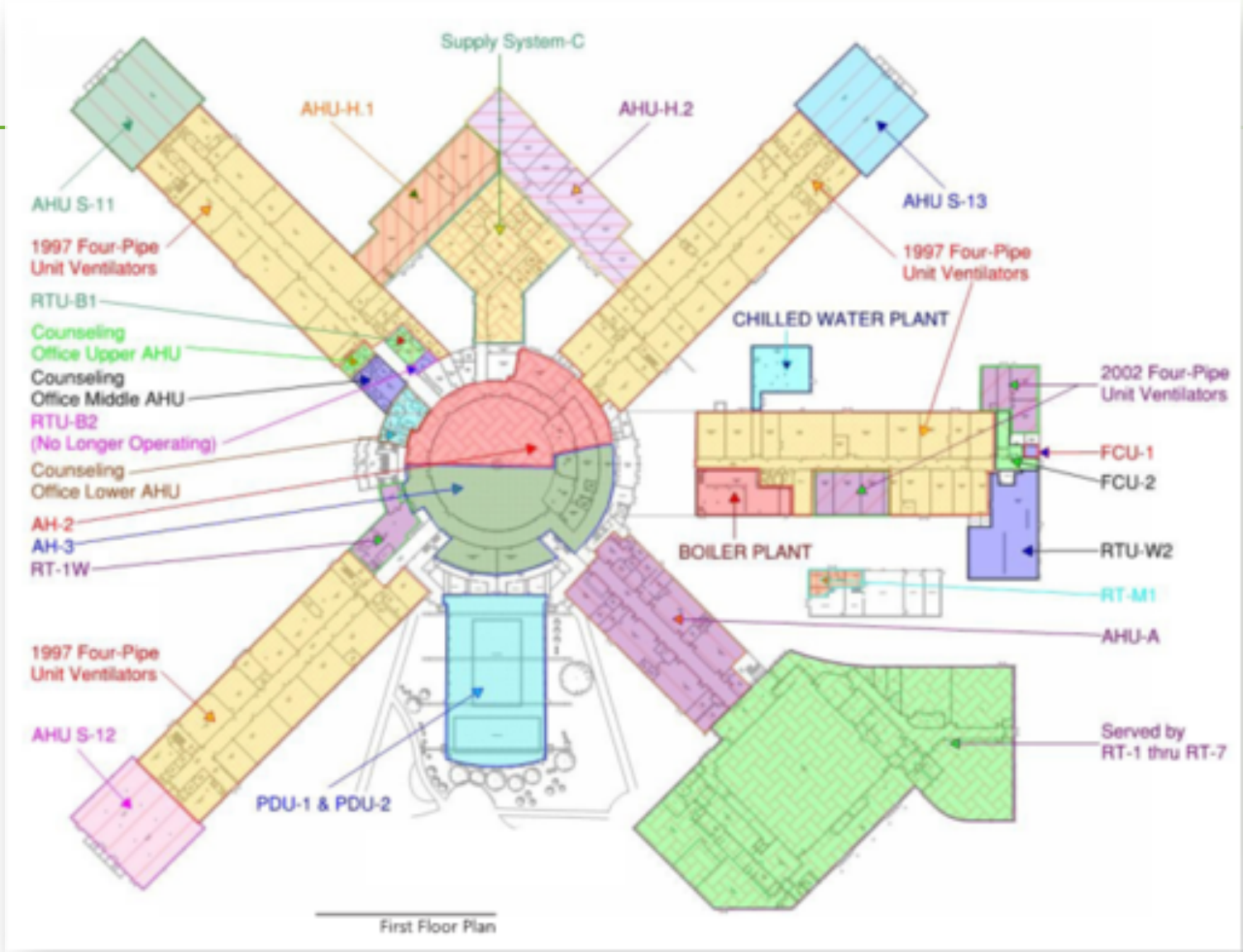
Maine West High School

Maine West High School

MAINE WEST HIGH SCHOOL

MEP

- Hodge podge of existing system types
  - Unit Ventilators (4-pipe)
  - RTUs
  - AHUs
  - Electric Chillers
- Significant amount of aged equipment
- Some existing areas without space cooling
- Predominantly existing T8 & T12 fluorescent light fixtures
- Boiler plant recently replaced and converted to hot water as part of a separate Elara project



MTHSD 207

2019-2023 Facility Master Plan Project

BUILDING (and Infrastructure) RENOVATIONS & ADDITIONS

- Classroom & Pool Renovations, Gymnasium Additions, and New Energy Efficient MEP Systems
  - New Fieldhouse & athletic spaces at Maine East New Courtyard infill and link ant Maine South
  - New HVAC systems included AHUs, RTUs, & FCU-DOAS with space cooling throughout
    - Standardized systems and equipment across all schools
    - Reuse of existing equipment where possible
    - Energy efficient equipment and design
    - Improved indoor air quality
      - Designed pre-COVID to meet or exceed post-COVID standards
  - New pool dehumidification systems for Maine East and Maine South

Phased IMPLEMENTATION

- BIM Software utilized for all phases

$240,700,000

- $195,000,000 Referendum
- $45,700,000 District Reserves
- Completed under budget allowing the School District to utilize the remaining funds for additional projects

FOCUSED INTERN PROGRAM

- Full-time Elara Summer Intern Program with MTHSD207 Site Walk
- School-year job shadowing for MTHSD207 nominated Students


STUDENT & FAMILY
SERVICES


EXIT


MAINE SOUTH


MAINE WEST


MAINE WEST


12"
18"

Thank you!

Boise School District - Performance Pro Example

Peter Therkelsen
LBNL – ISO 50001 Ready Program

Alison Ward
Boise School District

Performance Pro - Continual Improvement with 50001 Ready

Implementation of 50001 Ready at Boise School District

BERKELEY LAB

Performance Pro

Honoring schools and districts who strive for **continuous improvement** through

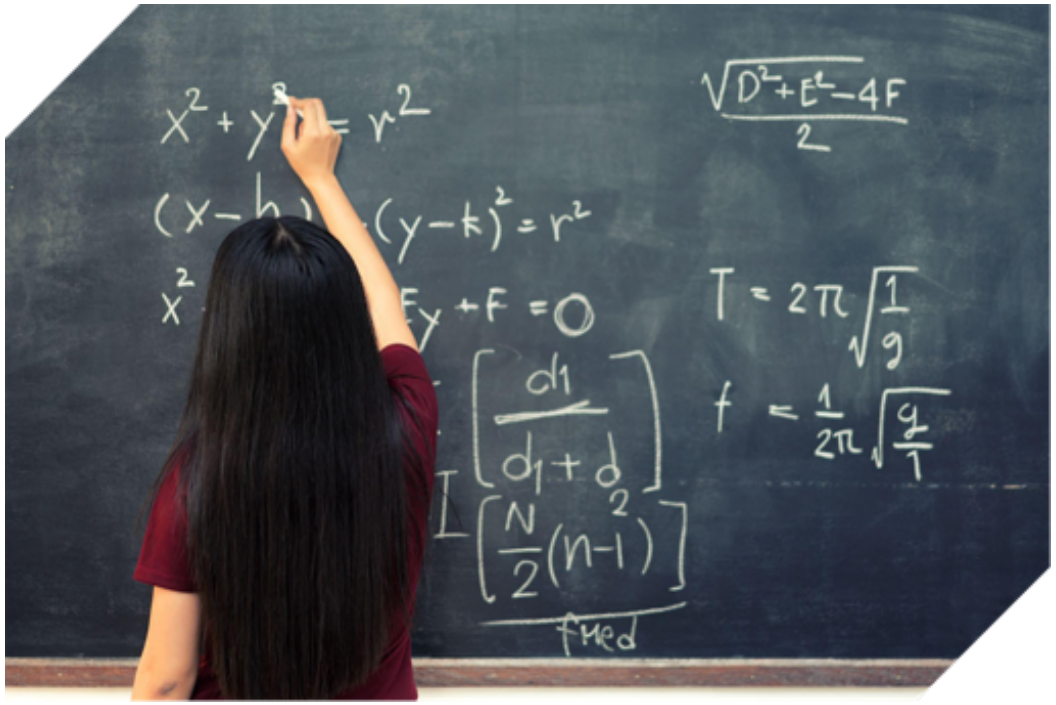
- **Operations and maintenance** (O&M) activities,
- **Performance evaluation**, and
- **Retro commissioning** (RCx).

Performance pro bonus:

- Continuous **people improvement**: students and staff

Energy Management System Supports Performance Pro

What is an Energy Management System (EnMS)?



- Integrates energy management into everyday business practices and procedures
- Saves energy and money, and helps organizations reach climate goals
- Not to be confused with building technologies used to manage energy

Why Implement an EnMS?

Implementing a structured EnMS can help organizations:

- Cut operational costs
- Achieve continual operational improvement
- Improve risk management

Example: Wendell School District cut power use by 32.8% between 2017 and 2021.

Wendell Elementary principal and staff discuss energy management activities.

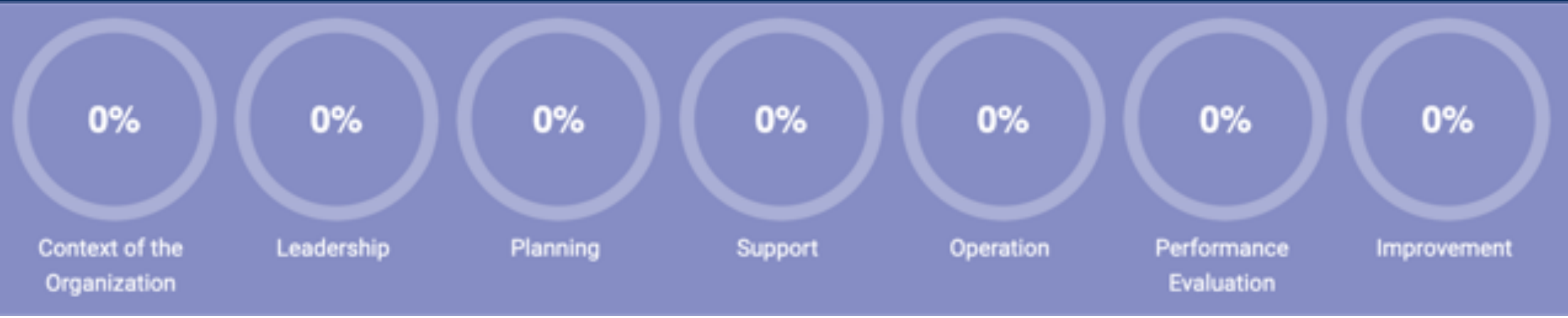
Photo credit: Wendell School District.

The U.S. DOE's 50001 Ready

Step-by-step self-paced framework enables organizations to create world-class energy management systems

- Online 50001 Ready Navigator guides users through 25 actionable tasks, grouped into 7 sections, that correspond to ISO 50001 requirements
- Suite of materials, tools, and other resources supports EnMS implementation and continuous improvement
- Opportunities for training, collaboration, and recognition by the DOE
- No certification costs or third-party verification

50001 Ready Sections Support Performance Pro



- **Operations and maintenance** (O&M) activities,
- **Performance evaluation**, and
- **Retro commissioning** (RCx).
- Continuous **people improvement**: students and staff

50001 Ready Adoption

6000+ sites globally

Every state has a
50001 Ready participant

Government installations, including military bases, NASA facilities, and national laboratories

K-12 schools

50001 Ready Adoption

Much of U.S. auto sector adopted 50001 Ready as its collective platform to manage decarbonization

Heavy industry, including aluminum and steel plants

Private and public hospitals

Data centers

Hotels

Strategic Energy Management (SEM) Programs

- Offered by various private and public organizations, typically utility energy efficiency programs
- 50001 Ready is often used in full or in part as the framework defining what energy management business practices are taught to participating companies
- Programs often incorporate cohort based training workshops, identification and assistance implementing energy efficiency projects, development of site wide regression models to calculate energy savings.

50001 Ready
U.S. DEPARTMENT OF ENERGY

For more information about 50001 Ready
50001Ready.lbl.gov

Access to the 50001 Ready Navigator
Navigator.lbl.gov

Boise School District Sustainability and EMS

February 29, 2024
Boise, Idaho

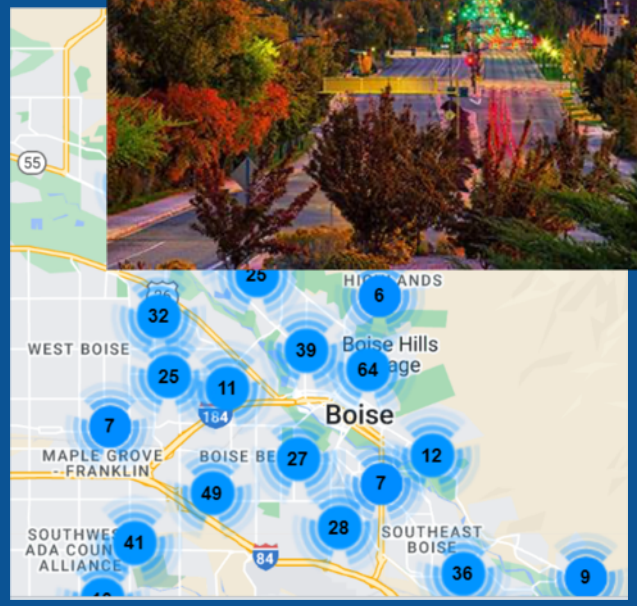
Alison Ward
BSD Sustainability Supervisor
Alison.ward@boiseschools.org

BOISE EST. 1881 SCHOOLS

Sustainability
Environmental | Educational | Economic

Background, Sustainability in the Boise Schools

- Public School District, Idaho's second largest
- 51 Schools and over 100 buildings serving an area of 1,072 sq mi.
- Approximately 22,500 students, and 4,000 staff. We maintain over 4.6 million sq ft of school buildings and 850 acres of grounds and fields.
- Sustainability initiatives and committees since 2016.
- Idaho Power Cohort -
  - Joined in 2017 with support from Strategic Energy Group, now up to 22 schools
- Board Resolution on Clean Energy in 2021 (unanimously adopted).



Sustainability in the Boise Schools

Interest Based Process to create an Action Plans:

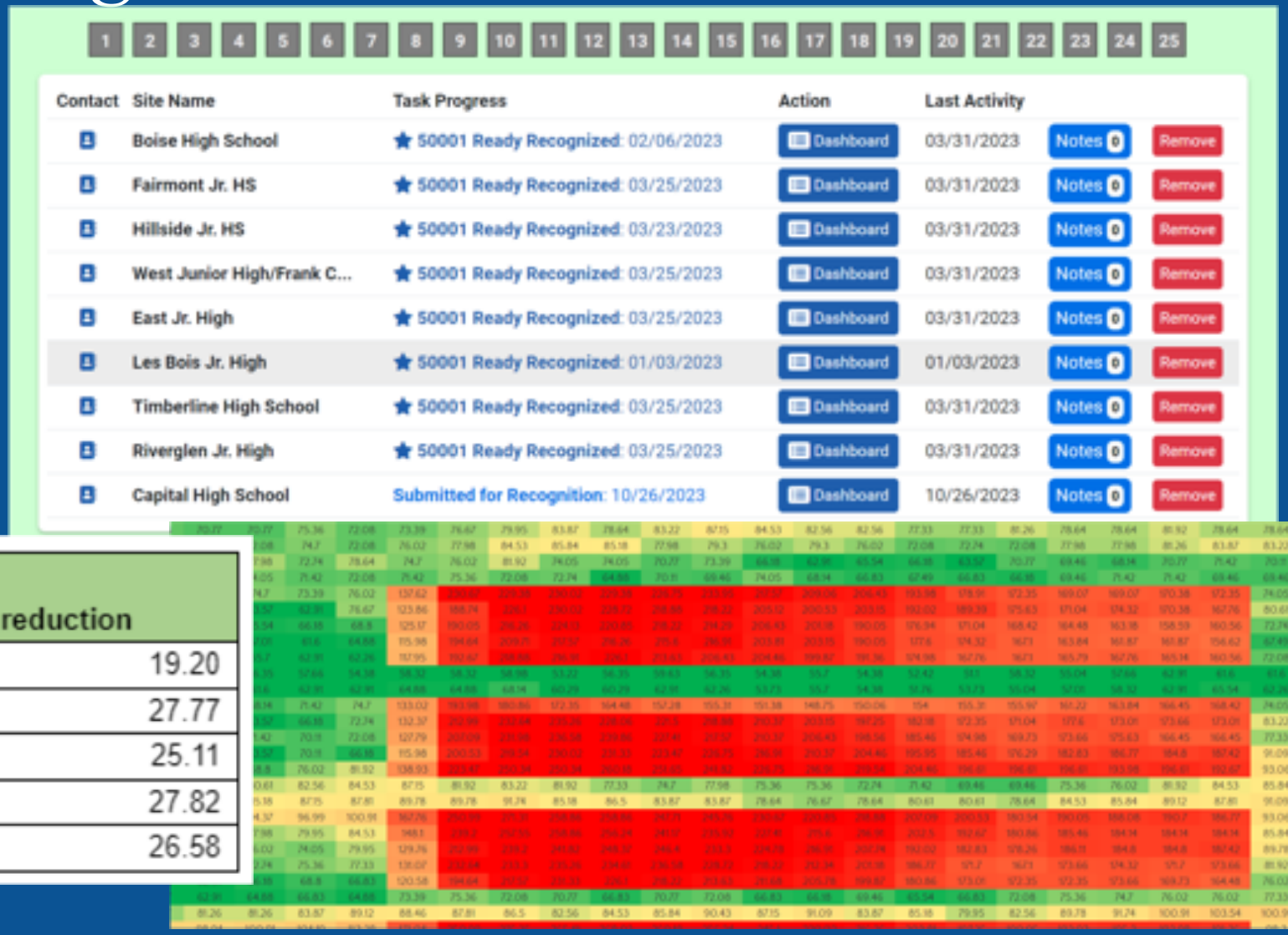
Key Values: **People, Planet, Prosperity**

- **Water**
- **Waste**
- **Energy**
- **Environmental Stewardship**

- Recently added full time sustainability staff member, and district wide Green Teams at all sites with a leadership stipend for GT Leads.
- Just Completed our first All Fuels Greenhouse Gas Audit - Scope 1, 2, and select Scope 3 (transportation, waste).

Energy Management Systems, DOE 50001 Ready, Powerdown Challenges

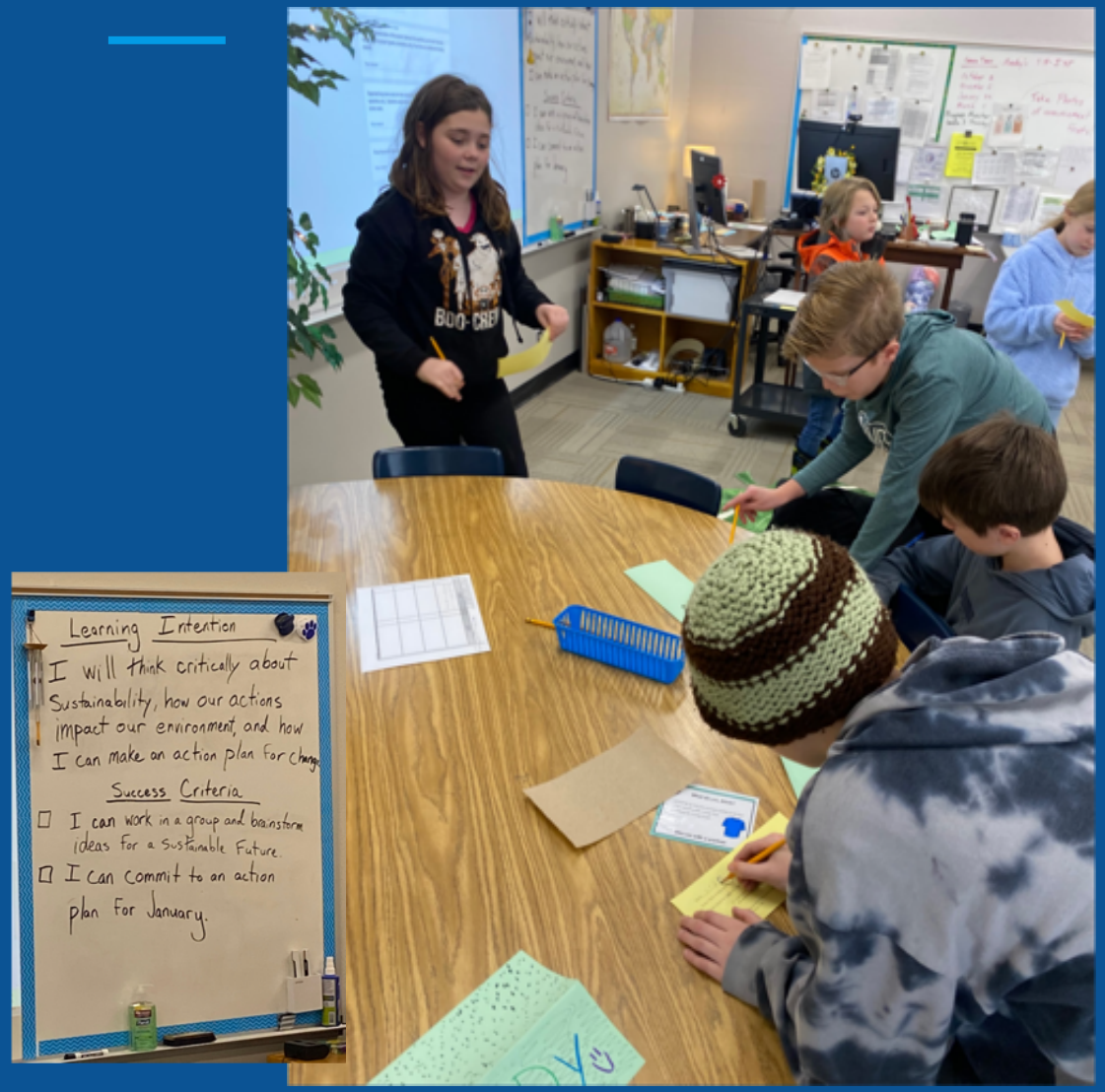
- Supportive
- Data Based
- Continuous Improvement



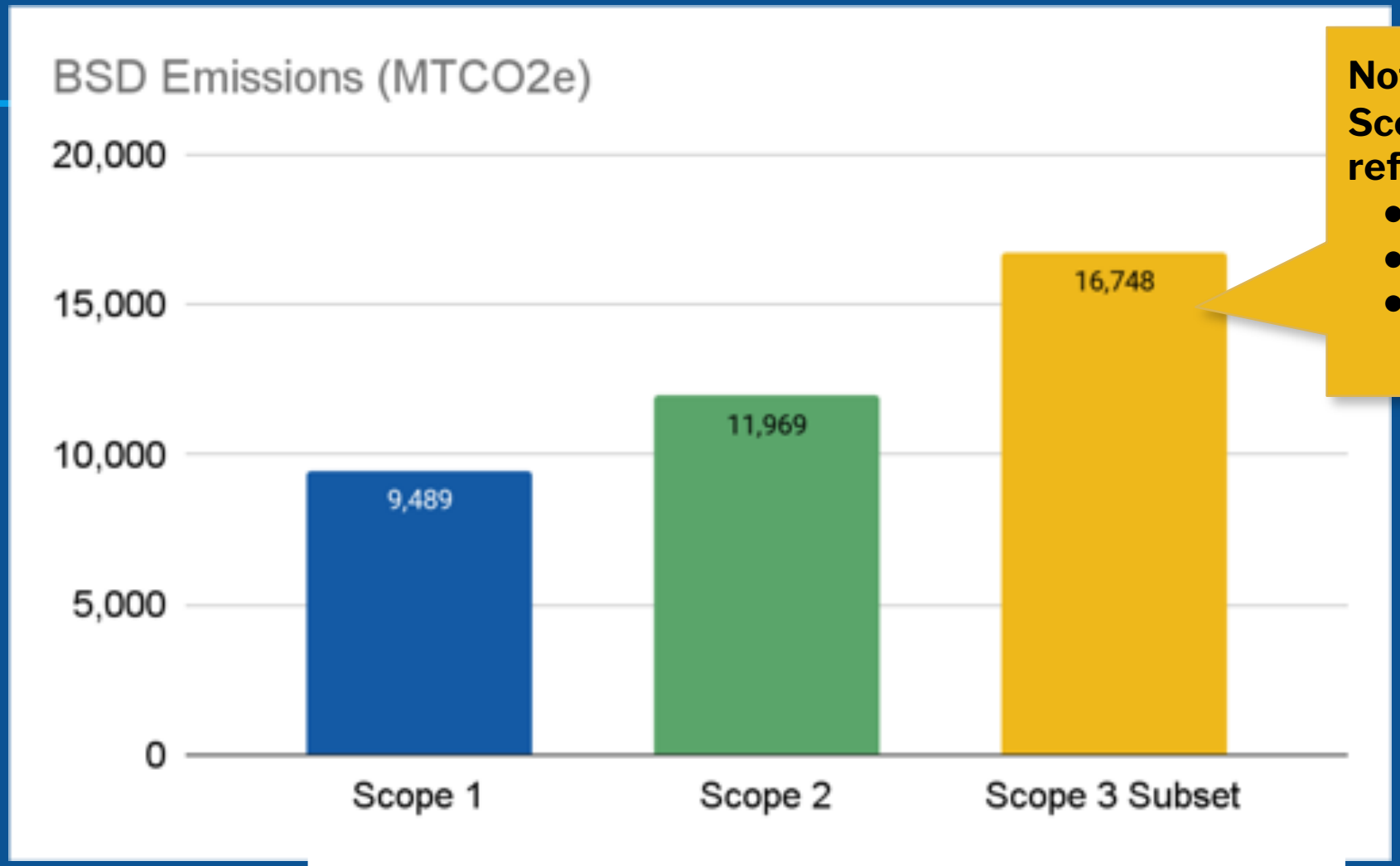
Winter Powerdown Data

Quad	Average Weekly kWh Savings	% reduction
Boise	31,549	19.20
Borah	36,177	27.77
Capital	33,316	25.11
Timberline	45,771	27.82
District Office	19,672	26.58

Green Teams at all Sites



Baseline Greenhouse Gas (GHG) Audit



Note: Only a subset of Scope 3 emissions are reflected:

- Waste
- Employee Commute
- Student Transportation

WARM SPRINGS Consulting LLC

Culture and Leadership Impact

- Insightful Performance Tracking Models, Heat Maps and GHG baselines
- Data analysis by students and building faculty
- Long term planning and commitment to energy efficiency and climate education
- Sustainability is becoming part of our BSD culture at the building level
- Mindset shifts and connectedness between F&O and Instructional teams
- Needs assessments, collaboration, gaps filled
- Curricular support and embedded learning for students

Question & Answer

Reilly Loveland
New Buildings Institute

THANK YOU – Connect with us!!

- **Let us know your interest!**
  Quick poll to hear about recognition pursuits.
- Join | Healthy Schools (lbl.gov)
- Subscribe to the Efficient and Healthy Schools Program Mailing List
- Resources | Healthy Schools (lbl.gov)

Apply for recognition today!