

2023-2024 Efficient and Healthy Schools Program

Recognition Program Cohort -
Solutions Strategist & Data Detective



**EFFICIENT AND
HEALTHY SCHOOLS**

Agenda

1. 2023-2024 Efficient and Healthy Schools Program
2. EHSP Resources Overview
3. GHG Emissions Reduction Strategizing
4. Using Data to Guide Decisions
5. Q&A and Breakout Sessions

Today's Presenters



Shannon Oliver
New Buildings Institute



Mischa Egolf
New Buildings Institute



Hannah Kramer
Better Climate Challenge



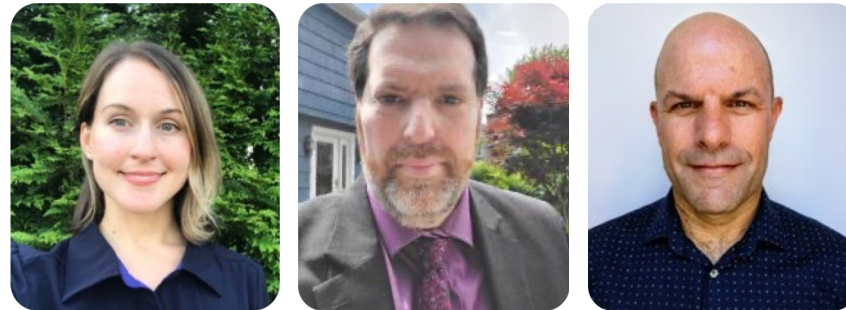
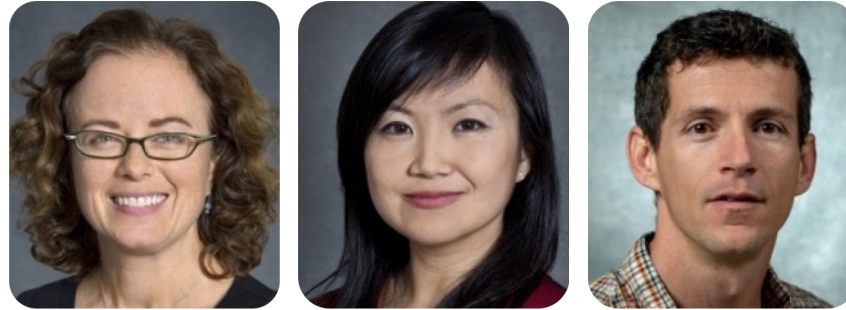
Gretchen Pflueger
Bellingham School District

The Efficient and Healthy Schools Program Team

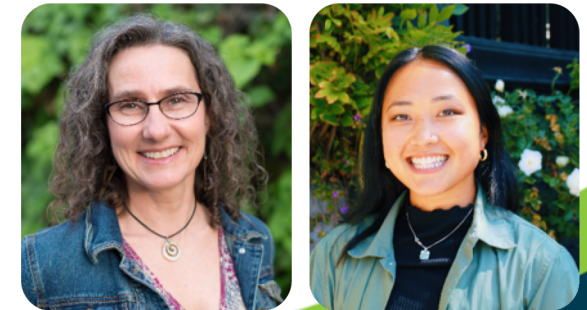
U.S. Department of Energy



Berkeley Lab



New Buildings Institute





2023-2024 Efficient and Healthy Schools Program

Shannon Oliver
New Buildings Institute



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.



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

Key Program Dates

Supporter Webinars

- March 27, 2024

Recognition Cohorts

- January 30, 2024 – Solutions Strategist & Data Detective
- February 29, 2024 – Retrofit Revolutionary & Performance Pro

Recognition application deadline

→ **April 5, 2024**



Technical Assistance: Categories



General Program Support

- Onboarding
- Identifying first steps & next steps
- Recognition submission assistance



Energy management

- Benchmarking
- Building assessments
- Energy analytics
- Retro commissioning



Goal Setting and Planning

- Develop district roadmap
- Facility planning & prioritization
- Documentation development: SOW, RFP, OPR



Technologies and Systems

- EEM identifications: HVAC, lighting, water, kitchens
- Energy Management Information Systems (EMIS) & Controls
- Commissioning
- Performance verification



Indoor Air Quality

- IAQ assessments and planning
- IAQ monitoring



Decarbonization

- Electrification approaches
- Emissions reduction calculations



Solar and Renewables

- Solar potential
- Program and funding opportunities



Resilience

- Technical Resilience Navigator
- Approaches to manage emerging risks e.g., extreme heat, wildfire smoke



Funding

- Identify federal, state, local and utility funding available
- Value proposition for funding pitch
- Performance based contracting

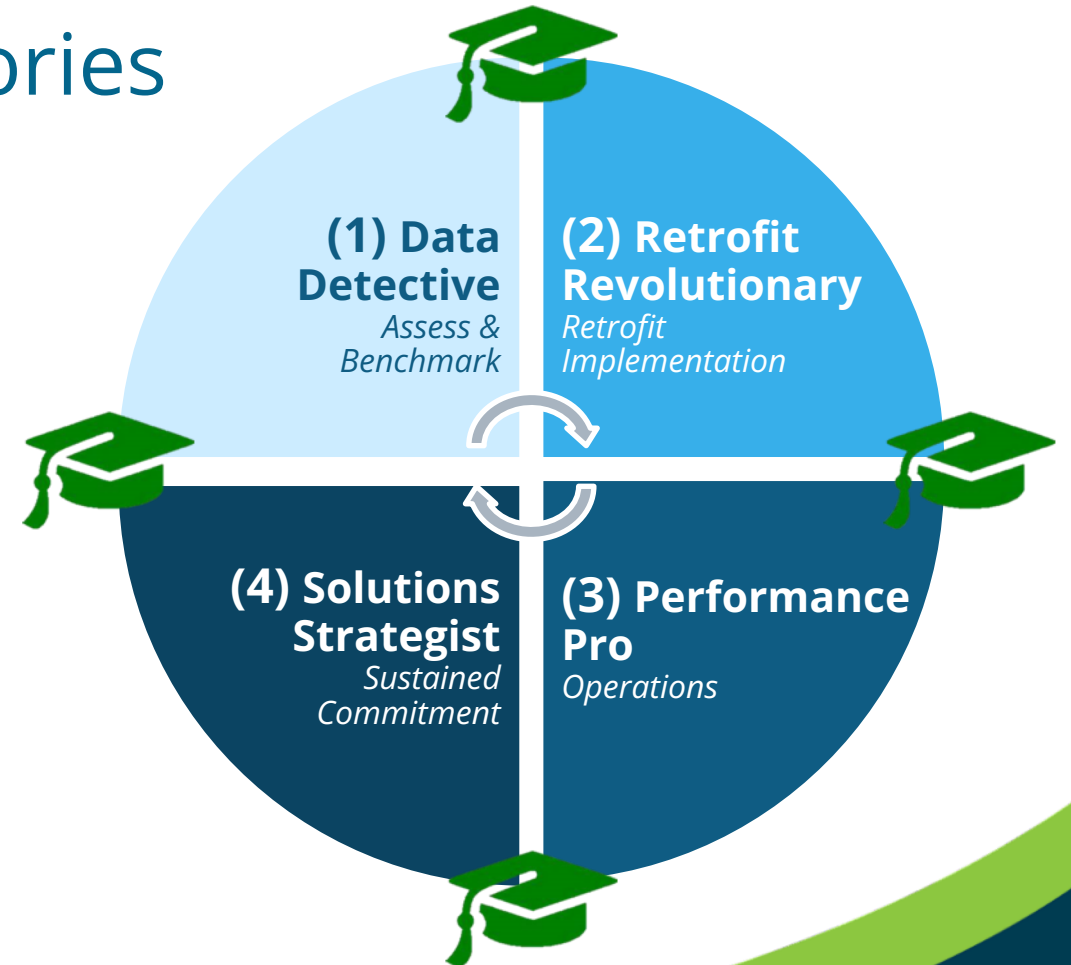
Technical Assistance: Process



2023-2024 Recognition Categories

All Categories Offered

- Tangible 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

April 2024

May-June 2024

Final Submission

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

Announcement & Celebration

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

Honoree
Participant



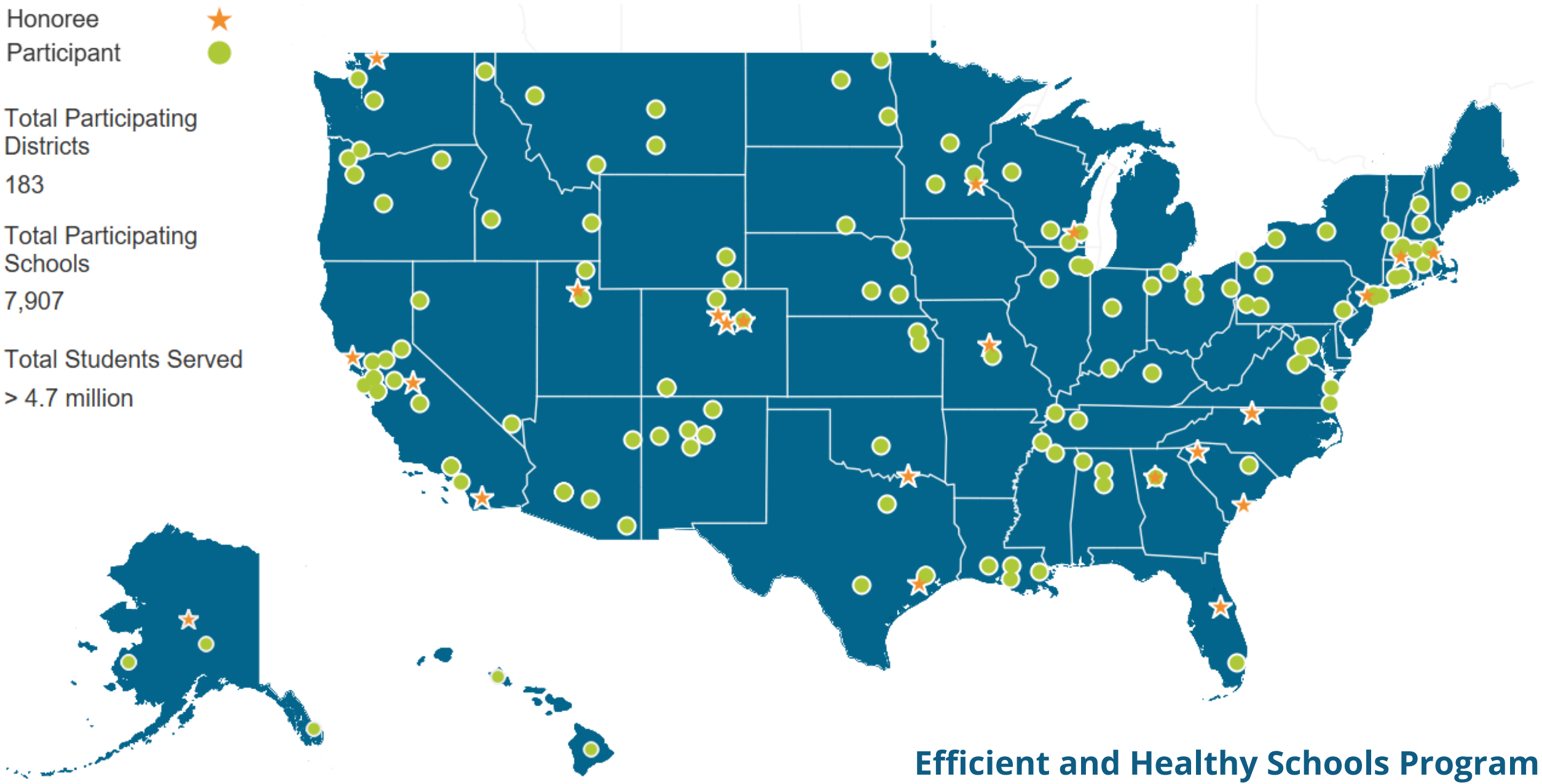
Total Participating
Districts

183

Total Participating
Schools

7,907

Total Students Served
> 4.7 million



**Efficient and Healthy Schools Program
Participants to date – January 2024**

Training Opportunity by LBNL / BEST Center



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



Training Groups & Timeline

Legend	Operators	Managers
Virtual	<p><u>Week 1 (virtual)</u></p> <ul style="list-style-type: none"> •Program Overview •Control Basics 	<p><u>Week 1 (virtual)</u></p> <ul style="list-style-type: none"> •Program Overview •Control Basics
Remote (hands-on)	<p><u>Week 2 (onsite)</u></p> <ul style="list-style-type: none"> •Hands-on Lab <p>Bldg 90 1144</p>	
In-person (hands-on)	<p><u>Week 3 (remote)</u></p> <ul style="list-style-type: none"> •EE & Decarbonization •Building Sys Interactions 	<p><u>Week 2 (remote)</u></p> <ul style="list-style-type: none"> •EE & Decarbonization •Building Sys Interaction
	<p><u>Week 4 (remote)</u></p> <ul style="list-style-type: none"> •Alarm Management •Data Analysis 	<p><u>Week 3 (remote)</u></p> <ul style="list-style-type: none"> •Data analysis •Building Sys Interactions
	<p><u>Week 5 (remote)</u></p> <ul style="list-style-type: none"> •BAS GUI Architecture 	
	<p><u>Week 6 (onsite)</u></p> <ul style="list-style-type: none"> •GEB •Building Tuning <p>Flex Lab/Bldg 90 1144</p>	<p><u>Week 4 (remote)</u></p> <ul style="list-style-type: none"> •GEB

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



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[Partners](#)

[Recognition](#)

[Resources](#)



[HVAC](#)

[Lighting](#)

[Indoor Air Quality](#)

[Assessment and Analytics](#)

[Financing](#)

[Energy Savings
Performance Contracting](#)

[Decarbonization](#)

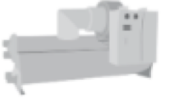



[Resilience](#)

[Case Studies](#)

School Energy Assessment (SEA) Form

This form is designed to help schools collect specific information that will be useful for providing an assessment of the facility, capturing important building characteristics including heating, ventilation and air conditioning system details, and site energy use intensity. Collecting this information is an important first step in identifying potential retrofit opportunities for your school and estimating costs, savings, and health and safety benefits from implementing Energy Conservation Measures (ECMs).

[Link to Excel](#)

Location 1: First look in the mechanical room (if you have one) to determine if you have central plant equipment. You will see one or more of the following:	Check the box for all equipment you see	
Chiller <ul style="list-style-type: none"> You will see a long cylinder tube or something that looks like a reciprocating engine in a car, depending on the type of chiller. Larger chillers will be connected by piping to a cooling tower (water-cooled) outside of the building or vertical fans (air-cooled) outside the building. 		<input type="checkbox"/>
Boiler <ul style="list-style-type: none"> A boiler will provide heat in the mechanical room when on, increasing the temperature in the room. You will see an exhaust duct from the boiler. The burner will be in front of the boiler, with a flame if it is on. You will see wires and pipes on the exterior. 		<input type="checkbox"/>
Warm Air Furnace <ul style="list-style-type: none"> This is usually vertical, with a distribution duct and exhaust duct coming out of it. You'll see a vent on the side or the front. 		<input type="checkbox"/>
Air Handling Unit (AHU) <ul style="list-style-type: none"> This is in the mechanical room. You can see something that looks like a hood vent for outside air. You will see ductwork to it (return air) and ductwork that goes to other parts of the building (supply air). It will have hot water piping from a boiler for heating and chilled water piping from a chiller for cooling (see Location 1 for a boiler and chiller). You will not see a fan. For larger systems, there will be thermostats in rooms, controlling heating and cooling. For larger systems, there will be a variable speed drive (VFD) on the wall of the mechanical room/space (see below in Location 1). 		<input type="checkbox"/>

Case studies

Partners

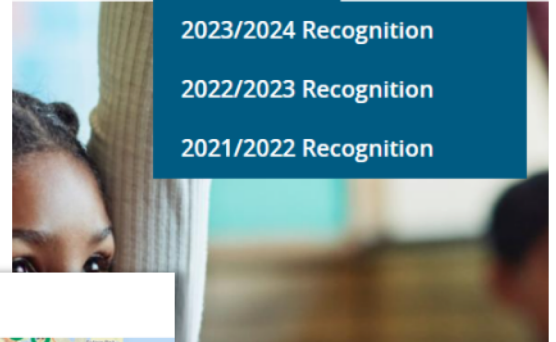
Recognition

Resources

2023/2024 Recognition

2022/2023 Recognition

2021/2022 Recognition



■ Efficient Healthy Schools Program Honorees:

- Examples for each category:

2023/2024 Recognition

- Previous winners for inspiration:

2022/2023 Recognition

■ Others:

- Resources → Case Studies



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 (CO₂), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), 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.

“Assess and benchmark”



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



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

Planning

Data Detective: Relevant Topic Areas

- Benchmarking and quantifying portfolio-level and/or building-level energy baseline
- Monitoring indoor Air Quality
- Understanding occupant comfort
- Assessing individual building systems (e.g., lighting audit)

Primary website resource sections:

- Assessment & Analytics
- Indoor Air Quality
- Specific technologies: Lighting, HVAC

Solutions Strategist: Relevant Topic Areas

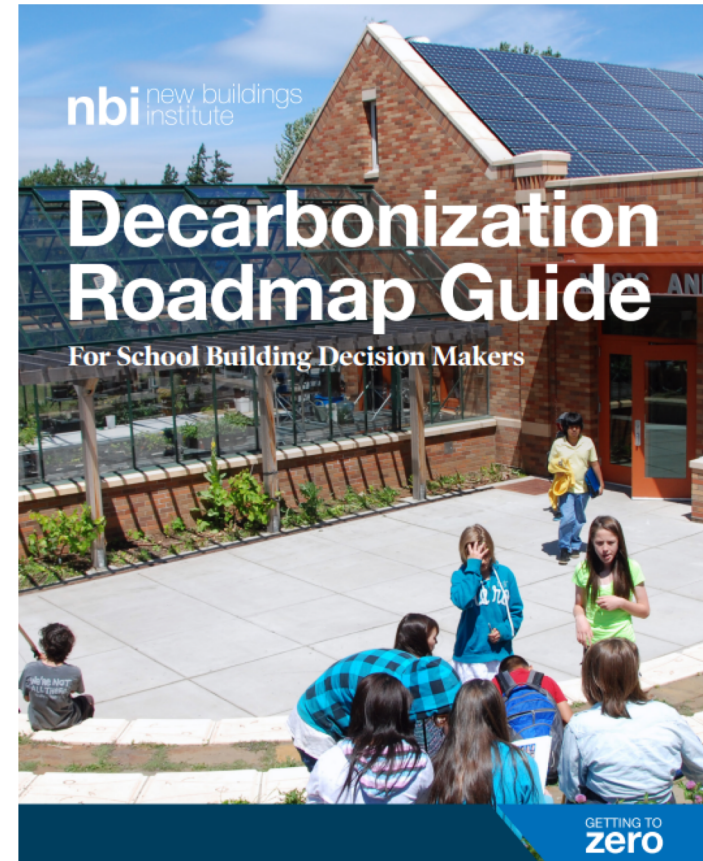
- Decarbonization planning
- Resilience
- Performance-based contracting and financing
- Funding solutions

Primary website resource sections:

- Decarbonization
- Resilience
- Financing

Example Resources

[ENERGY STAR Portfolio Manager](#)



[Decarbonization Roadmap Guide](#)

We are here to help!

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





GHG Emissions Reduction Strategizing

Hannah Kramer

LBLN, Better Climate Challenge

Better Climate Challenge

- Many organizations have set emissions reduction goals – what we need now is **action and pathways**
- Nearly 180 partners have joined the Better Climate Challenge since its launch in February 2022, committing to at least a 50% reduction in scope 1 & 2 GHG emissions in 10 years
 - Encompasses all sectors of the economy, including industrial, commercial, public sector, and multifamily
- In the first year of reporting, partners shared GHG emissions reduction results:
 - Across more than 850 million square feet of building space and more than 2,100 industrial facilities
 - On average, program partners are seeing 21% GHG emissions savings from their base year
- Key Focus Areas
 - Technical assistance and peer exchange
 - Resource creation; problem solving
 - Data collection and accountability
 - Outreach and recruitment across all sectors
 - Information sharing and feedback



Why is a GHG Emissions Reduction Planning Framework needed?

Partners implementing projects without an overarching plan
Portfolio-level planning is complex with many options



**Climate Action Plan
or Sustainability Plan**

Gap!

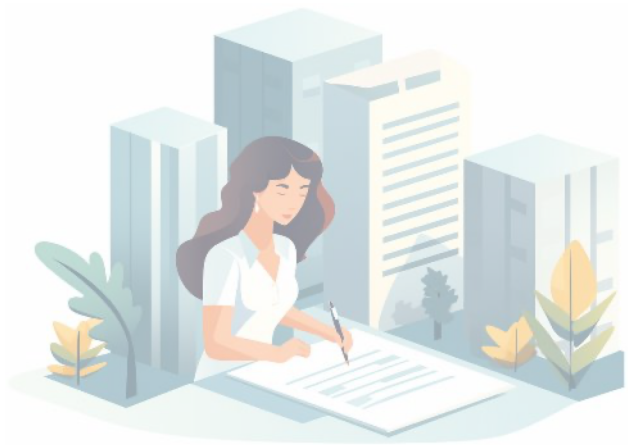


**Building-level Emissions
Reduction Audits**

Filling the gap

Emissions Reduction Planning (ERP) resonates with partners - they want support

Partners need more examples of documented decarbonization pathways



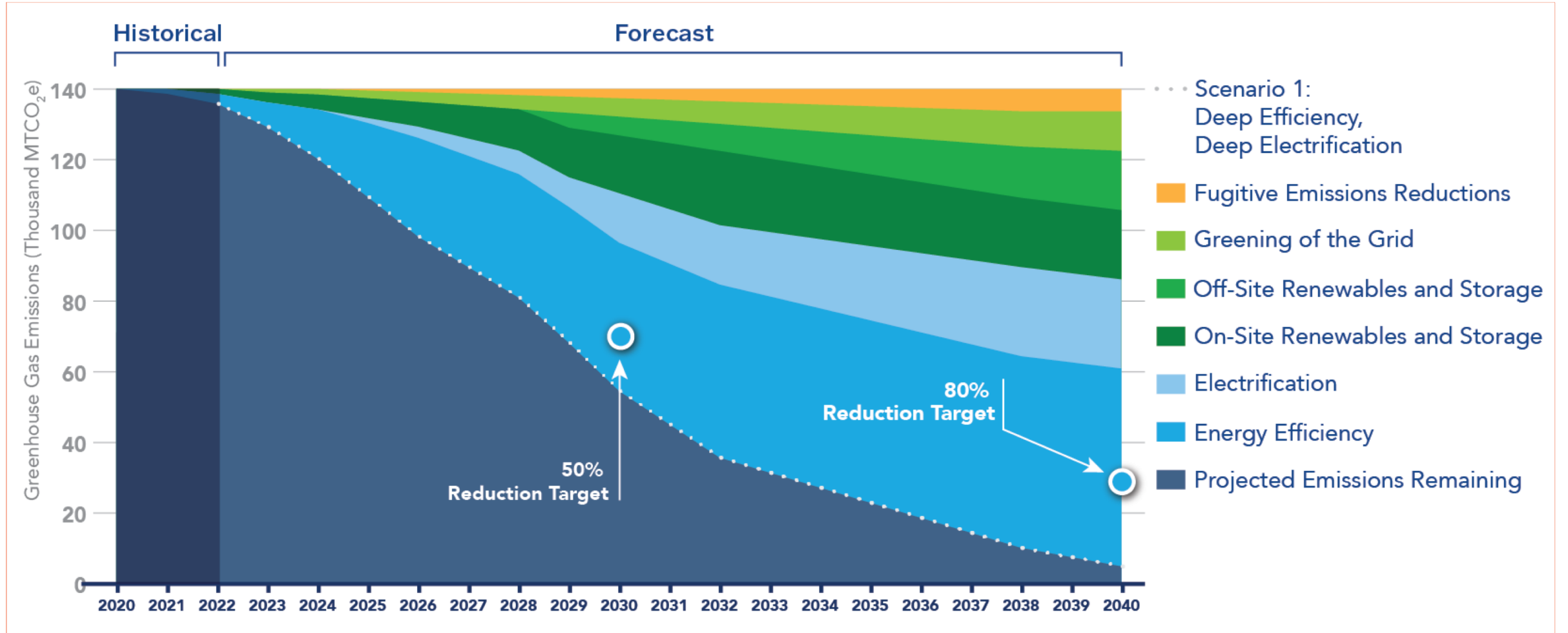
**Climate Action Plan
or Sustainability Plan**

**Portfolio-level Emissions
Reduction Plan (ERP)**

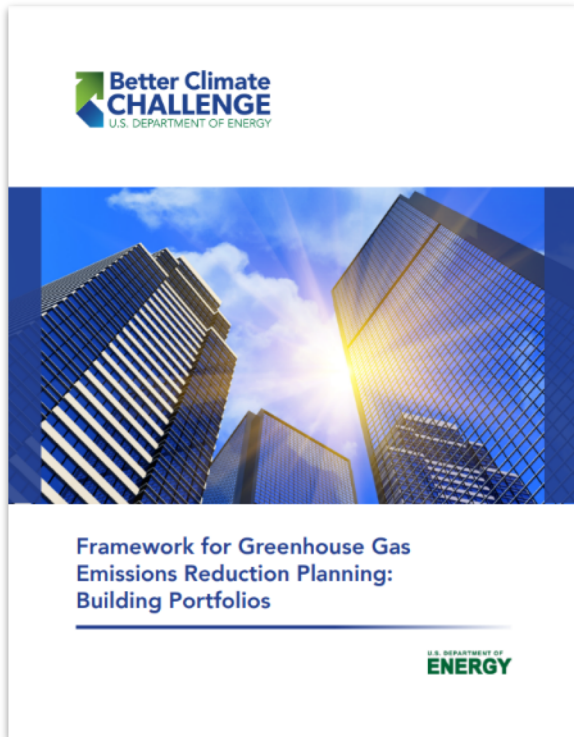


**Building-level Emissions
Reduction Audits**

The Emissions Reduction Plan represents “How we will get there”



DOE Framework for GHG Emissions Reduction Planning (published 2023)



Milestone 1: Establish Inventory & Scope of Work

Pull together
GHG inventory
and set GHG
target

Milestone 2: Categorize Portfolio

Group buildings
into categories to
scale measures to
the portfolio

Milestone 3: Assess Measures

Assess Energy
Efficiency,
Electrification,
Renewables
measures

Milestone 4: Develop Scenarios

Determine
which
combinations
of measures
meet targets

Milestone 5: Define Emissions Reduction Plan

Define a
phased plan
with actionable
steps

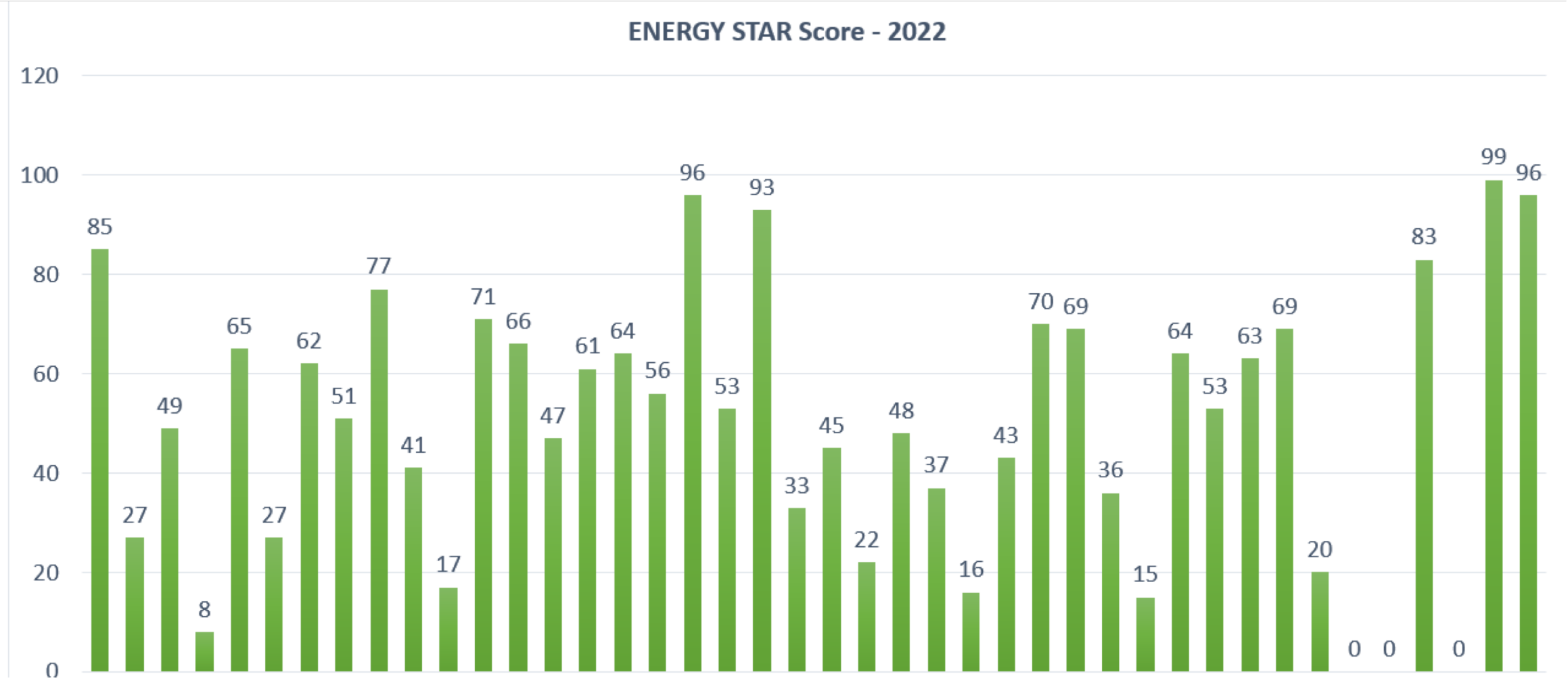
Benefits of Joining the Better Climate Challenge

- Support in developing your GHG emissions reduction plan
- Leverage ENERGY STAR Portfolio Manager benchmarking data
- Connect with others with decarbonization goals

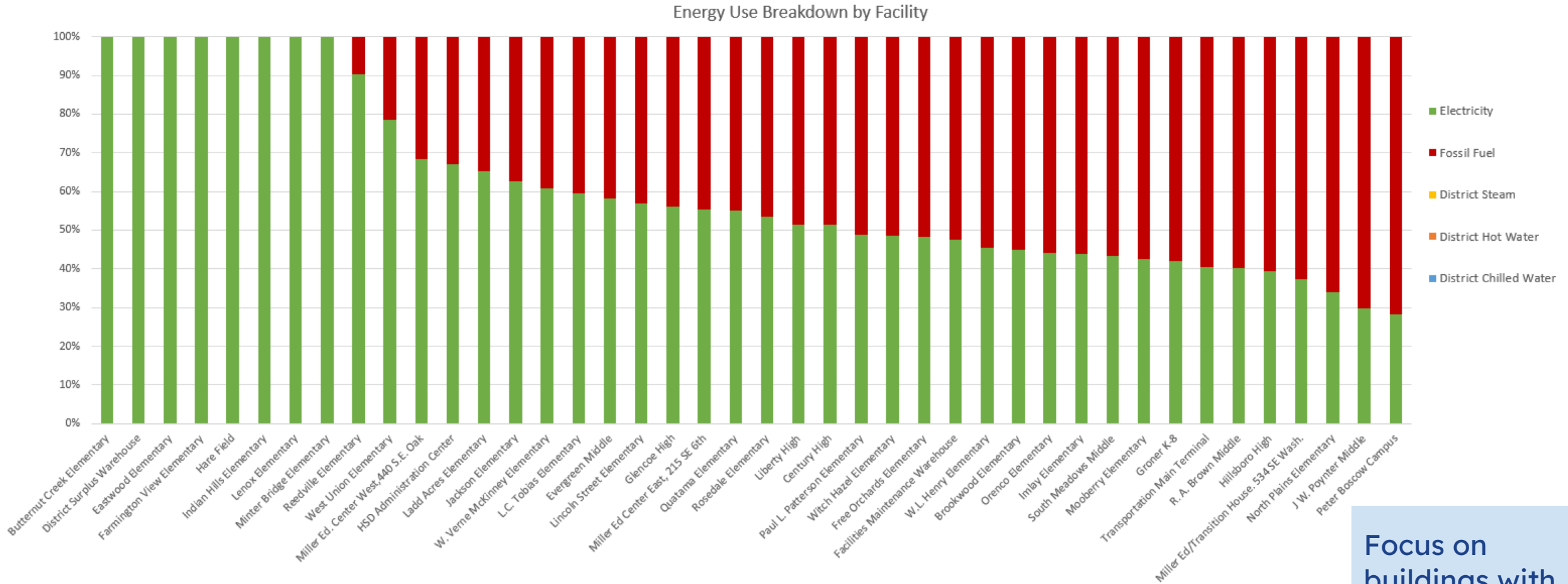
- Example: Hillsboro School District
 - Long-time effort in strategic energy management and energy retrofits
 - Has used ENERGY STAR Portfolio Manager for many years
 - HSD committed to BCC's 50% GHG emissions reduction (scope 1&2) within 10 years
 - Working with BCC to start developing their emissions reduction plan



Hillsboro School District (HSD): ENERGY STAR scores

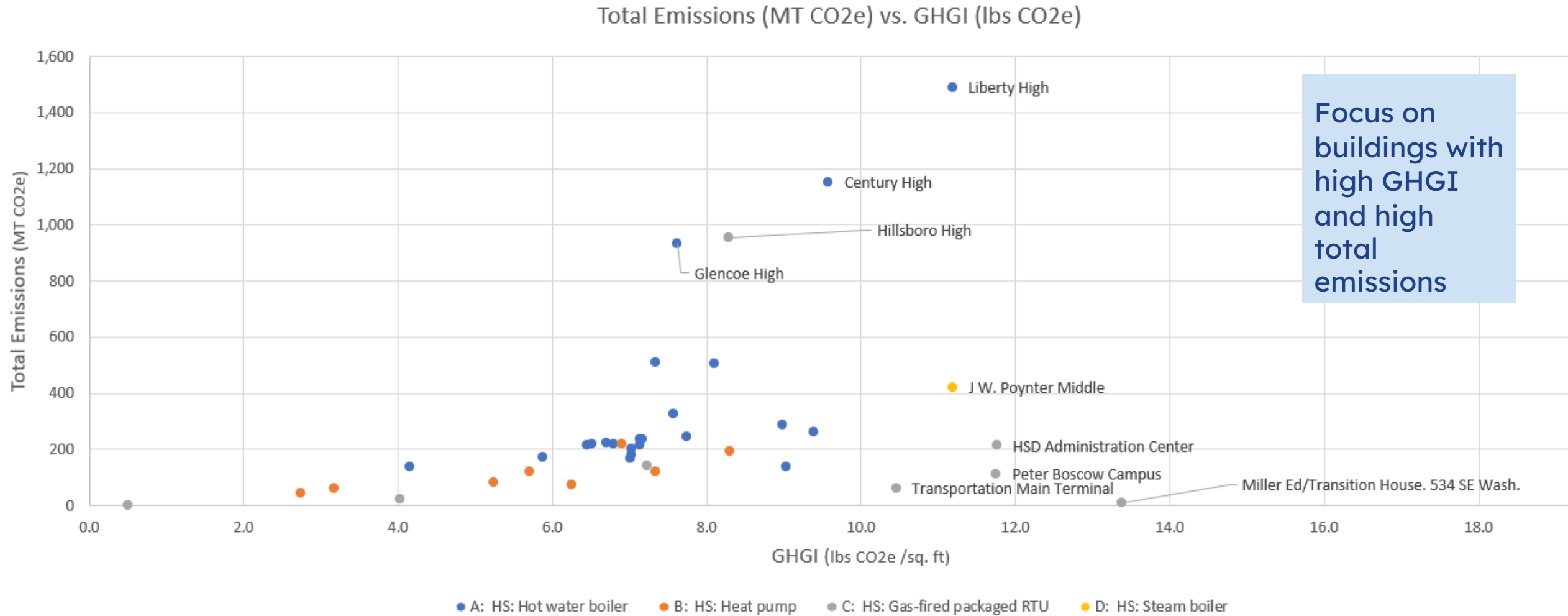


HSD: % Electric and Natural Gas Energy Use by Building

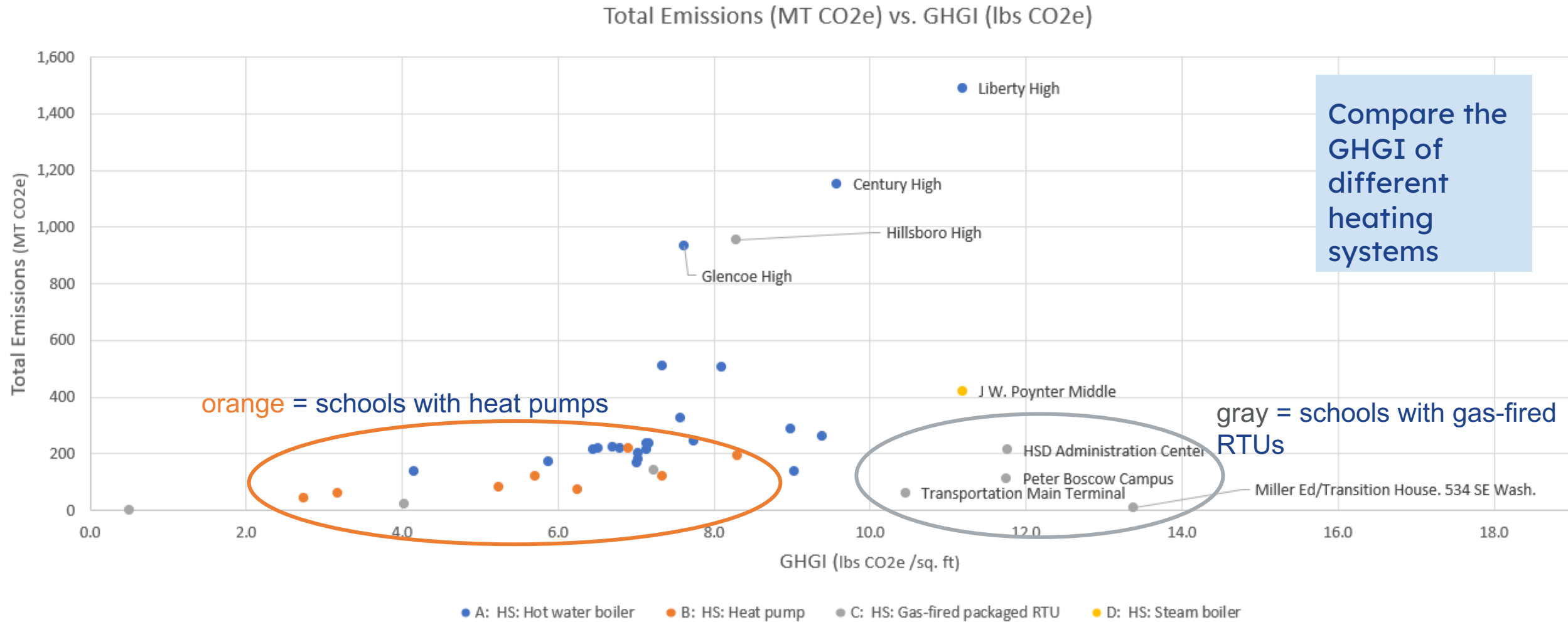


Focus on buildings with largest fossil fuel use

HSD: Categorization of portfolio by heating source

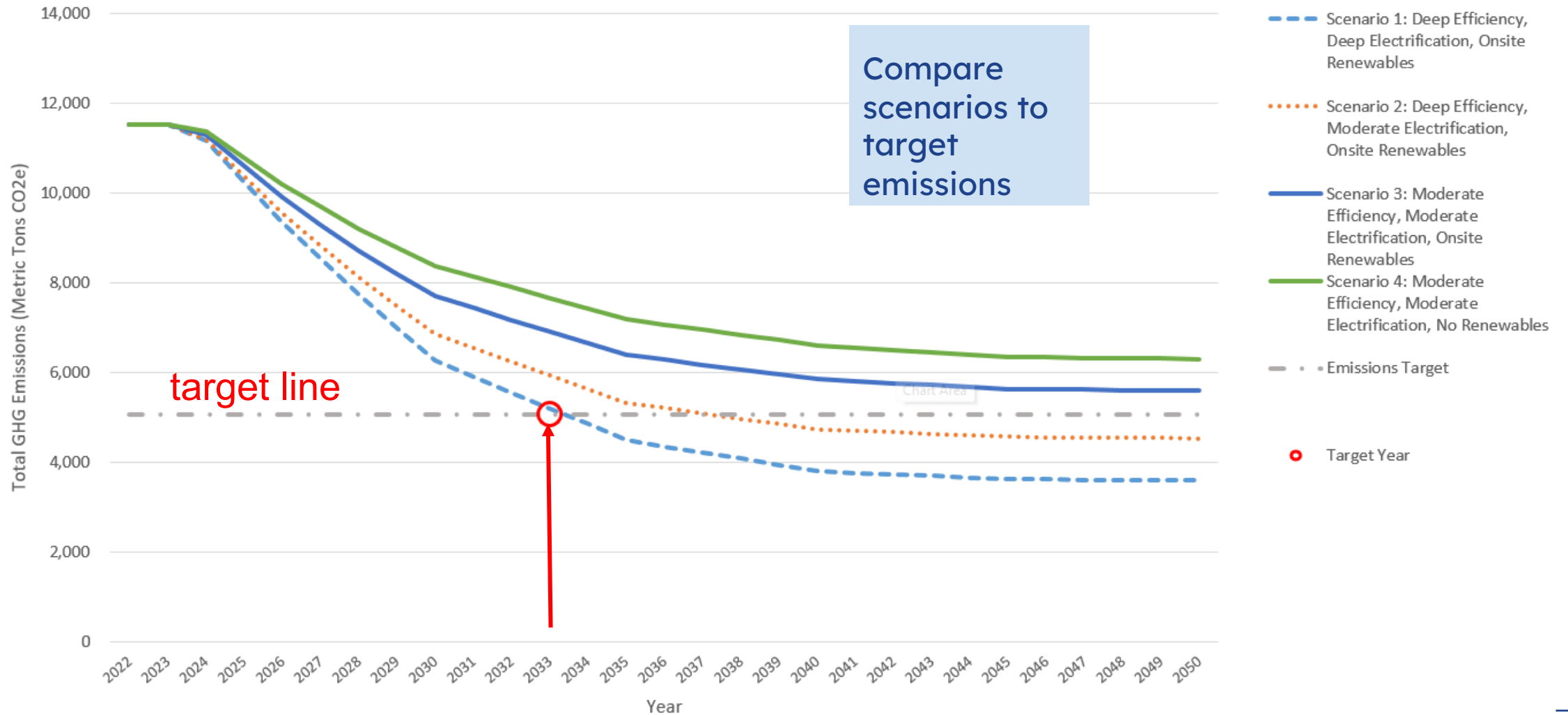


HSD: Categorization of portfolio by heating source



HSD: Emissions Reduction Scenarios

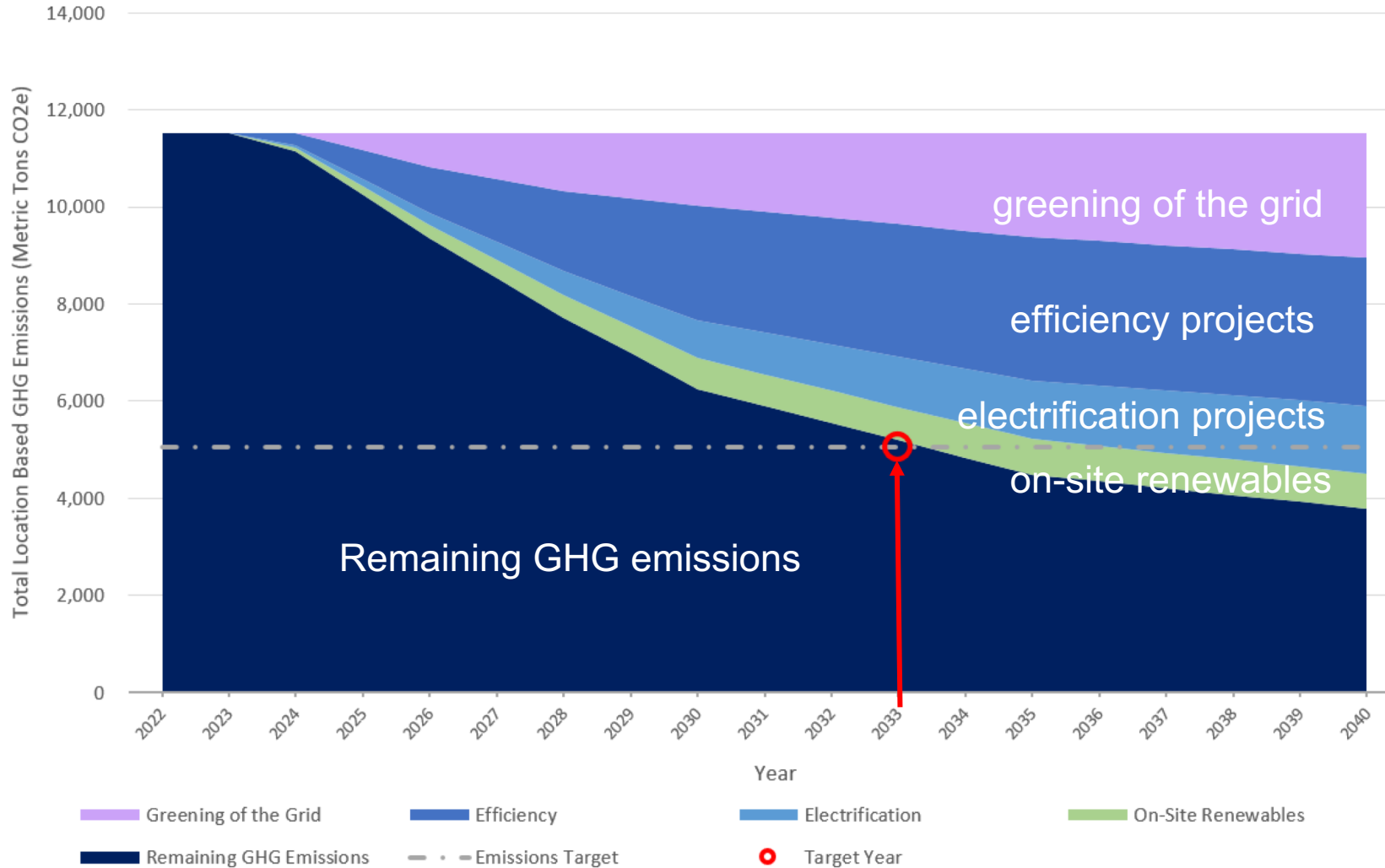
Portfolio Level Emissions Reduction Scenarios - Grid Emissions : Mid Case



HSD: Emissions Reduction Planning

Scenario 1 Wedge Chart - Grid Emissions Model: Mid Case

Scenario 1: Deep Efficiency, Deep Electrification, Onsite Renewables



Source of emissions reduction for a scenario that meets the target



Decarbonizing our economy requires leadership and action now.

Partners commit to reduce portfolio-wide GHG emissions (scope 1 & 2) by at least 50% within 10 years; DOE provides technical assistance and recognition for sharing results.

150+ organizations are partners. Is yours?

Learn More & Join

betterbuildingsolutioncenter.energy.gov/climate-challenge





Bellingham Public Schools: Climate Action Planning Strategy

Gretchen Pflueger
Bellingham School District

Bellingham Public Schools



Sunnyland ES, 2022



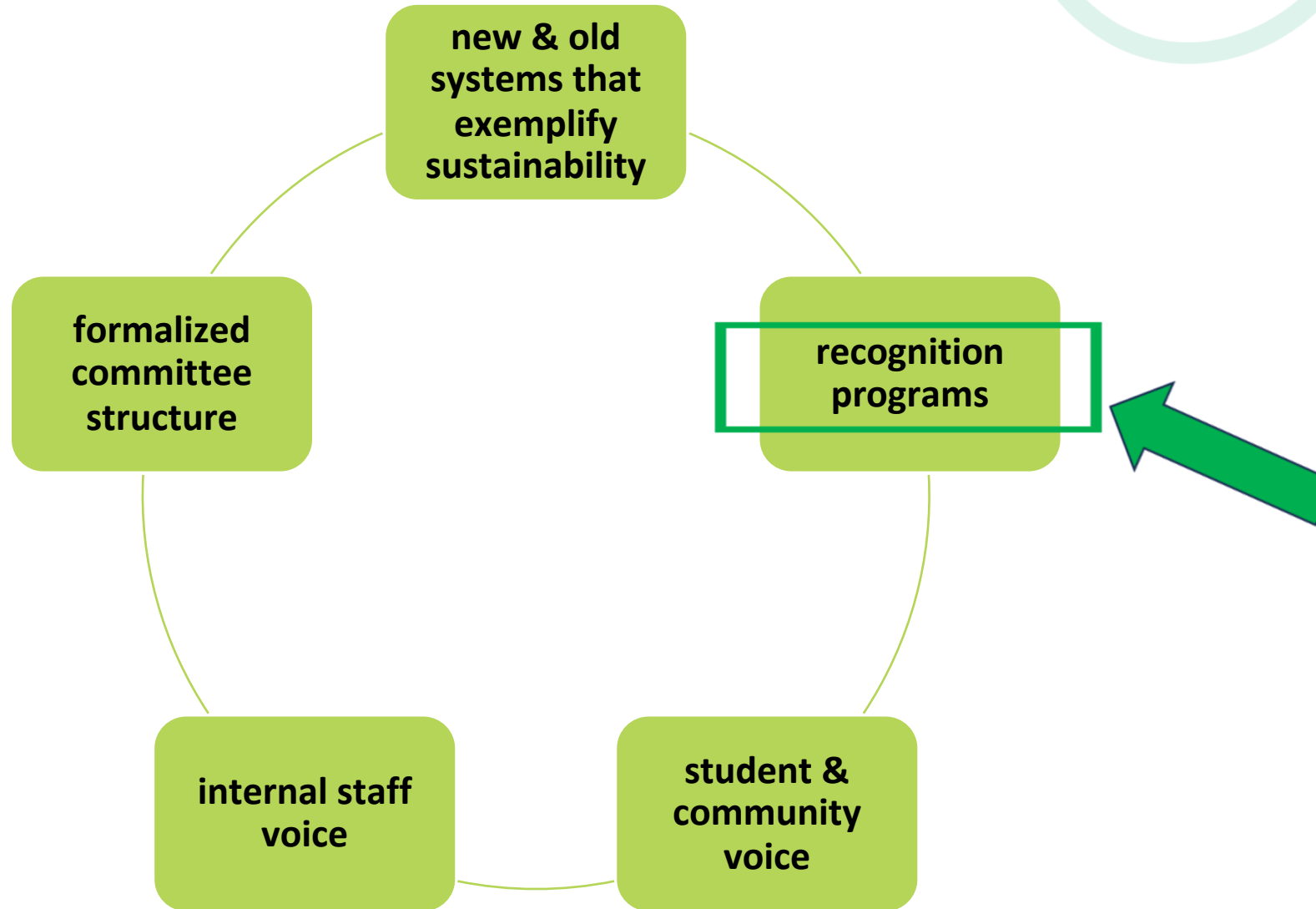
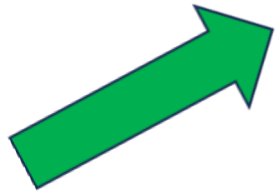
Columbia ES, 1925, 1980

- Bellingham, Washington
- 11,000 students PreK-12
- 35% FRL
- 1,800 staff
- 9,100 families
- 4,000 volunteers
- 22 school buildings
- 8 additional buildings
- 280 acres of land
- 1.9MM square feet of building space

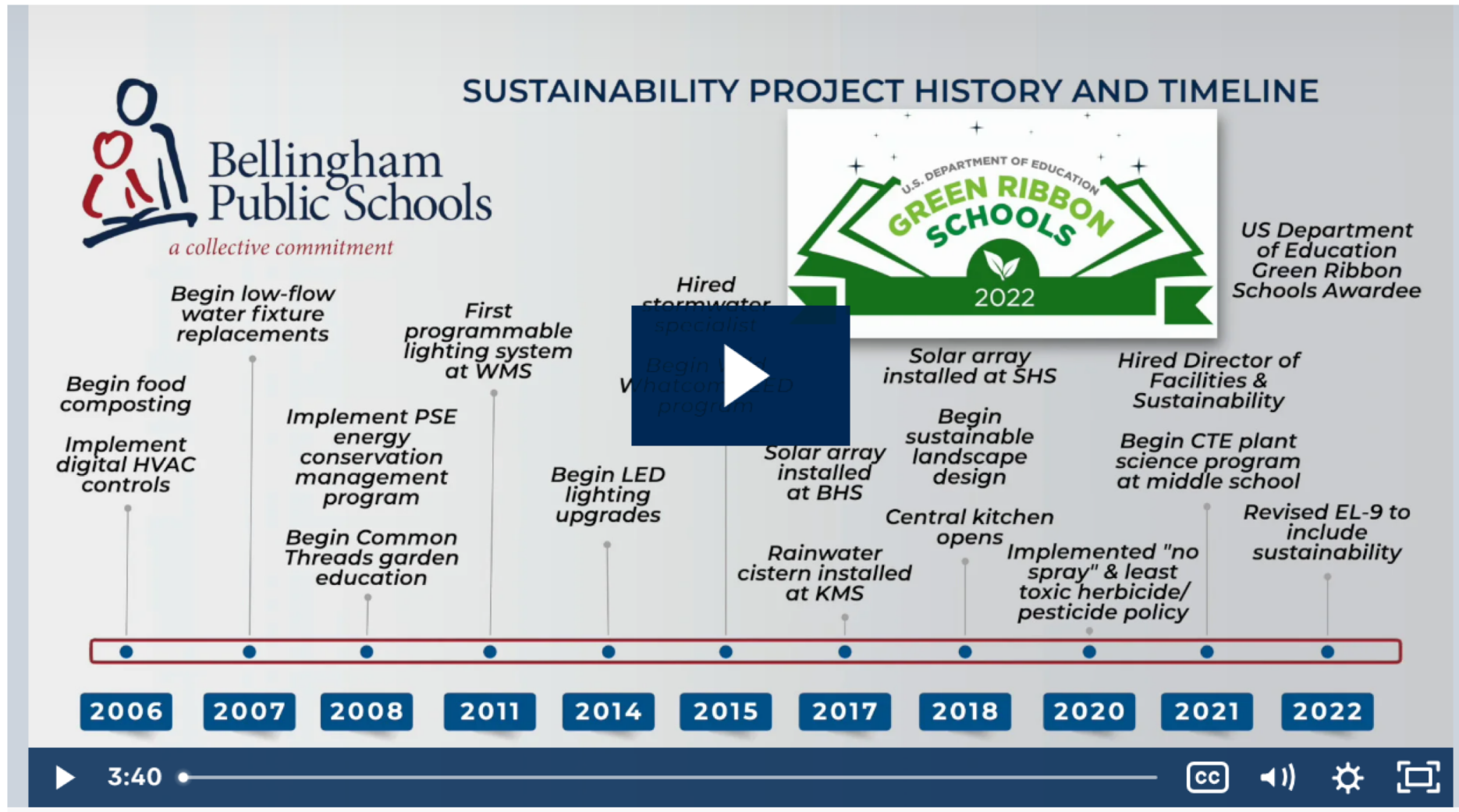
Influential Factors



branding the work



Video





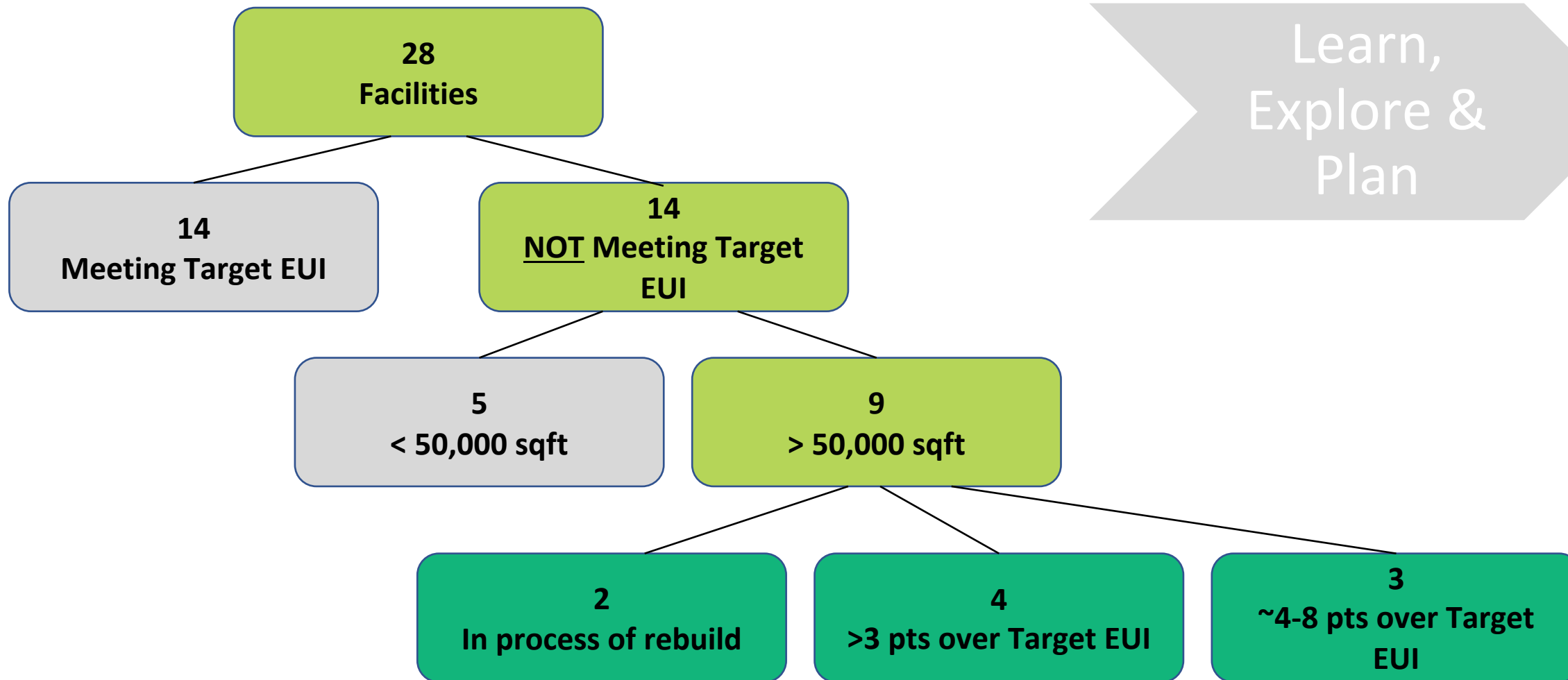
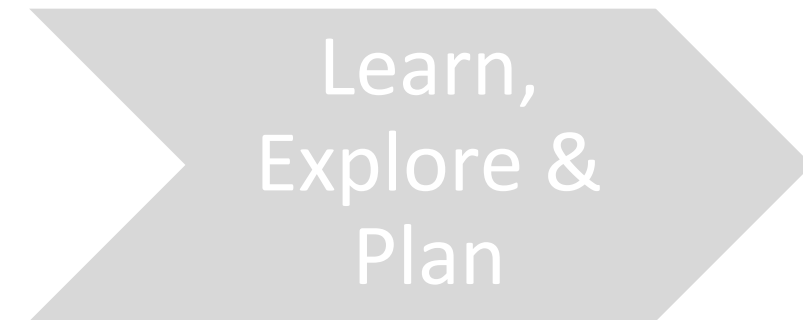
Process & Next Steps



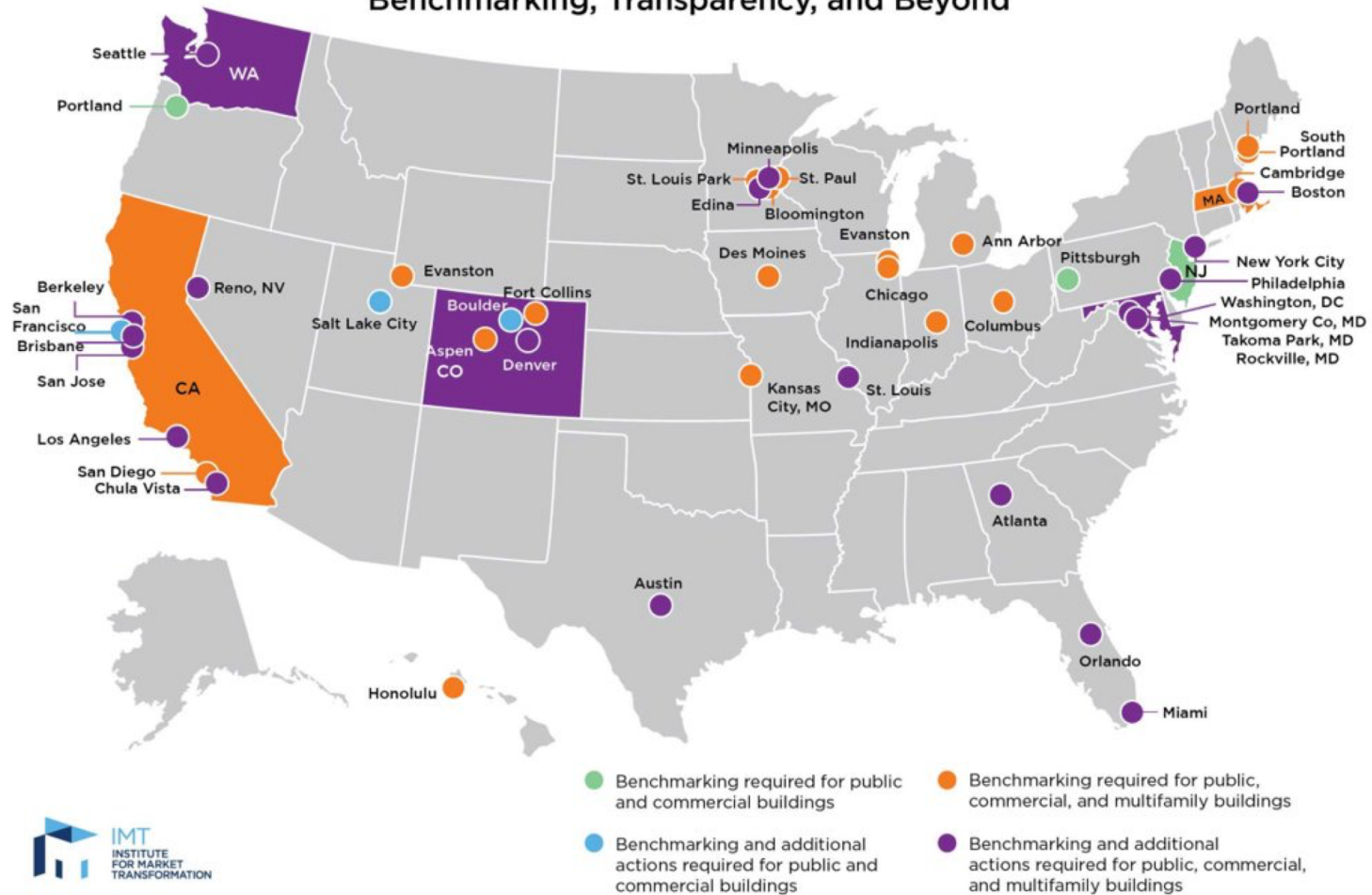
Inflation Reduction Act, 2022



Benchmarking EUI Results, 2022



U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond



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Climate Action Planning

Areas of Focus



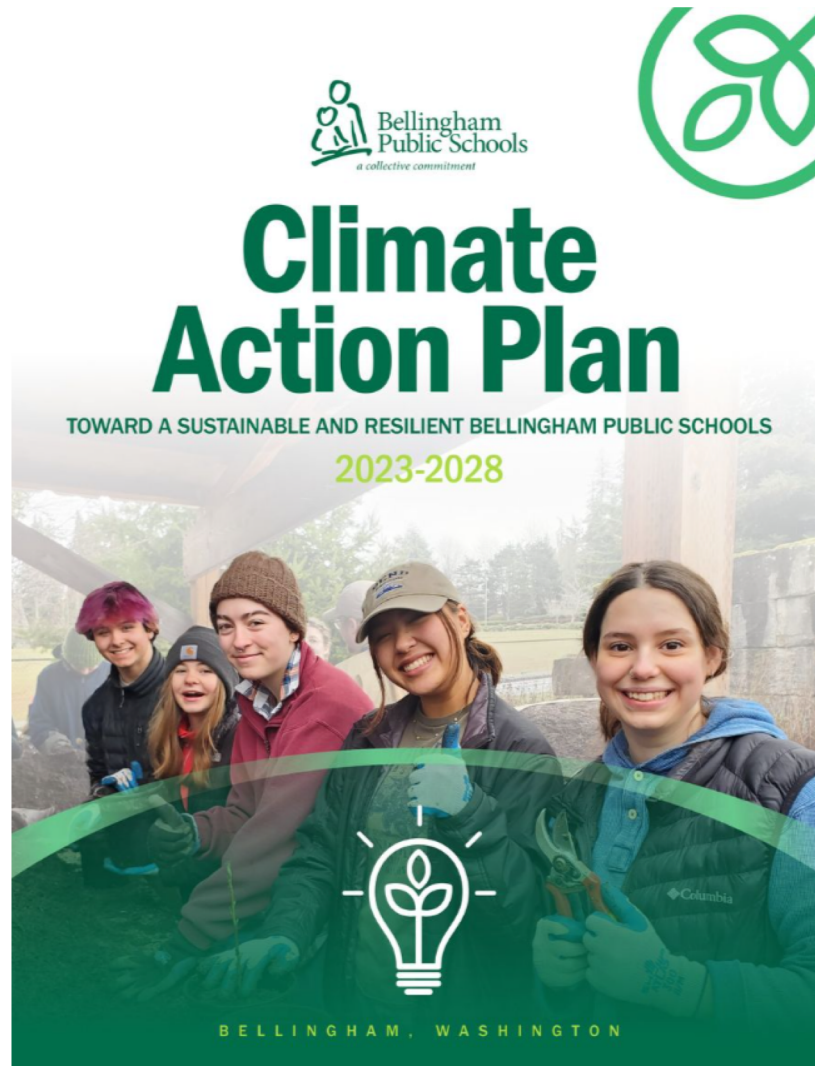
Facilities & Operations



Teaching & Learning



Habits & Culture





Challenges throughout the process

- **Benchmarking: consistent data entry methodology, BIG lift**
 - Manual entry vs. automatic upload
 - Truncated data system uploads (i.e., PSE to Portfolio Manager)
- **Balance of the desire to move quickly and act while working within a large institution**
 - Staff, students and community members highlighting **urgency to meet the moment**
 - Idea that “forward progress = visible action”
- **Need for dedicated staff with capacity**
 - Historically had zero humans dedicated to sustainability
 - Now have a Director Facilities & Sustainability (added to an existing position, not stand alone)
 - “you don’t know what you don’t know”



Question & Answer

Reilly Loveland
New Buildings Institute

Breakout Sessions & Feedback

- You will be assigned to a breakout room in zoom.
- In a separate browser, navigate to Miro:
https://miro.com/app/board/uXjVN6uP5pl=/?share_link_id=374866449450
- Discussion on current or planned projects that fit today's recognition categories.
- We'll come back together before the end of the webinar!
- **Let us know your interest!** Quick poll to hear about recognition pursuits.

THANK YOU – Connect with us!!

- Join | [Healthy Schools \(lbl.gov\)](https://www.lbl.gov)
- Subscribe to the Efficient and Healthy Schools Program [Mailing List](#)
- Resources | [Healthy Schools \(lbl.gov\)](https://www.lbl.gov)

**Apply for
recognition
today!**

