



THE HVAC CHANGE LAB

A NEW MODEL FOR SCHOOL FACILITY TRANSFORMATION

July 21, 2026



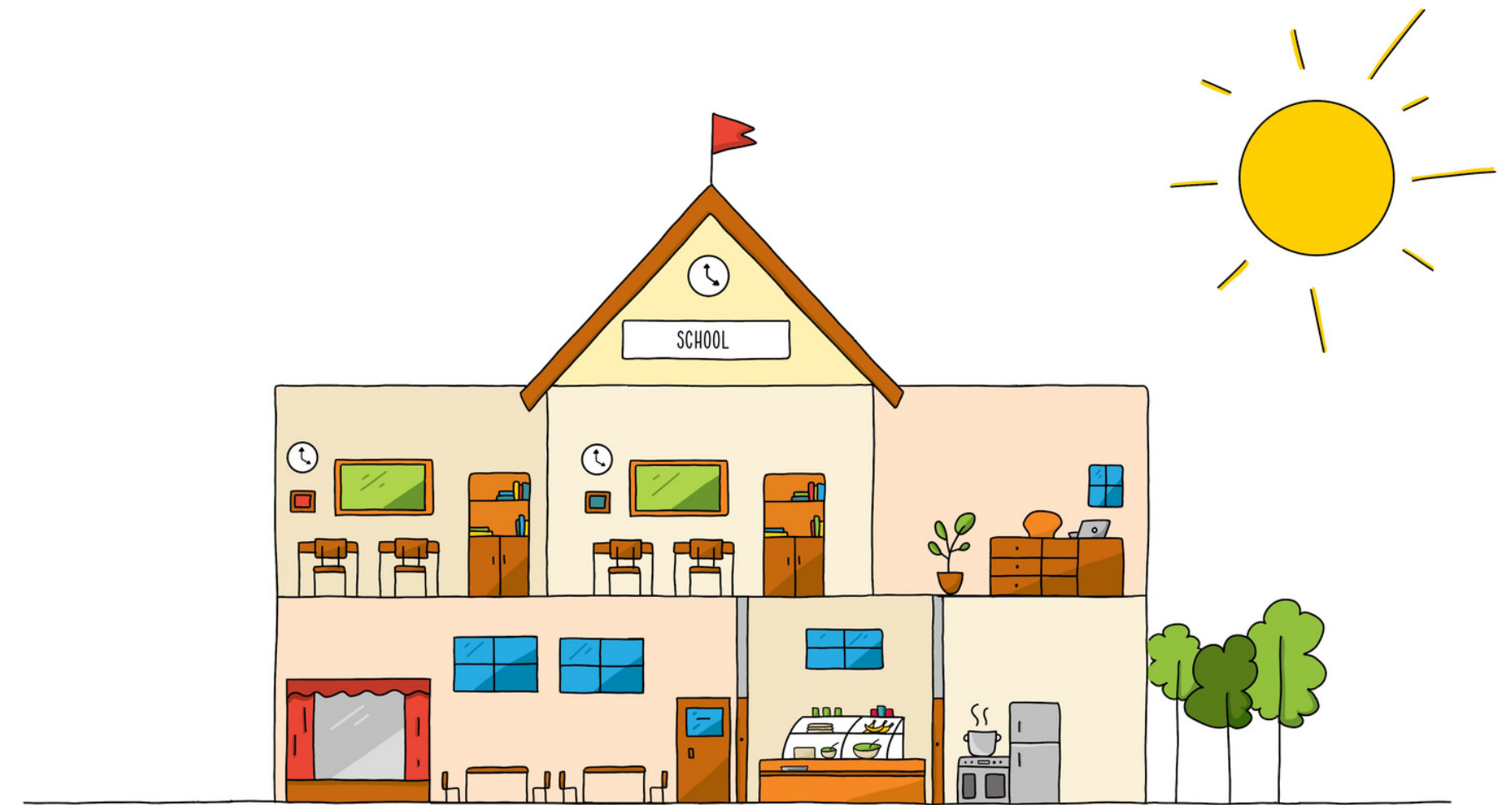
Center for Green Schools

NCES National Center on
School Infrastructure

nbi new buildings
institute

AGENDA

- Welcome & Connecting
- Framing the HVAC Change Lab - Why are we all here?
- Where we're headed with the Change Lab
- IDEA Public School District Highlight
- Prince William County School District Highlight
- Call to Action!
- Q&A, Closing and Next Steps



LET'S CONNECT

- Zoom Zebra (poll)
- Who's in the room?
 - Where you're calling in from
 - Portion of Industry
 - Role / position



FOUNDING PARTNERS OF THE HVAC CHANGE LAB



Where you can find us:

school-infrastructure.org/about-us/hvac-change-lab/

HVAC CHANGE LAB TEAM

Center for Green Schools



Anisa Heming, Director
of Center for Green
Schools



Craig Schiller
Director



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Technical Director



Mikayla Poulin-Gilbert
Certification Reviewer

National Center on School Infrastructure



Jeff Vincent
Consortium Director



Naomi Cytron
Managing Director

New Buildings Institute



Reilly Loveland
Associate Director



Shannon Oliver
Sr Project Manager

THANKS TO OUR SPONSORS

The McKnight Foundation logo consists of a solid red square. Inside the square, the words "MCKNIGHT" and "FOUNDATION" are stacked vertically in a white, serif, all-caps font.

**MCKNIGHT
FOUNDATION**

The betterbricks logo features the word "betterbricks" in a bold, black, sans-serif font. A green diagonal slash is positioned at the end of the word.

betterbricks/

A building is not a backdrop to learning. It is an input.

+20% / +26%

faster progress in math / reading for students in the most daylight classrooms

+15%

gain in student cognitive performance from improved ventilation alone

3×

the math gains, with measurably lower stress, in a better-designed classroom

~16%

of a year’s learning progress traces to classroom design alone



Heschong Mahone Group (1999); LBNL / Fisk; Determan & Browning (2019, 2024); Barrett et al., Building & Environment (2015). Fremont HighSchool · QKA · CHPS Verified. The “after” is comprehensive modernization; HVAC is the entry point.

WHY WE BUILT IT

Districts name the same three barriers. We built the Change Lab around them.

FUNDING

Not the binding constraint

Voters approved \$117B in school bonds in 2024; pass rates hold at 75-82%. The money is flowing. We are focused on optimizing the use of that money.

CAPACITY

We tackle this

Hands-on technical assistance walks a project from barrier to decision, so facilities staff can focus their time on the day-to-day issues.

KNOWLEDGE

We tackle this

We curate what exists, translate research to practice, and get the right knowledge to the right district in time to change a decision.

Three things districts told us shaped the design

“We don’t know where to go for information.”



One front door. A neutral navigator that assembles the field’s partners, funding paths, and expertise around a district’s decision.

“We learn best from peer districts like ours.”



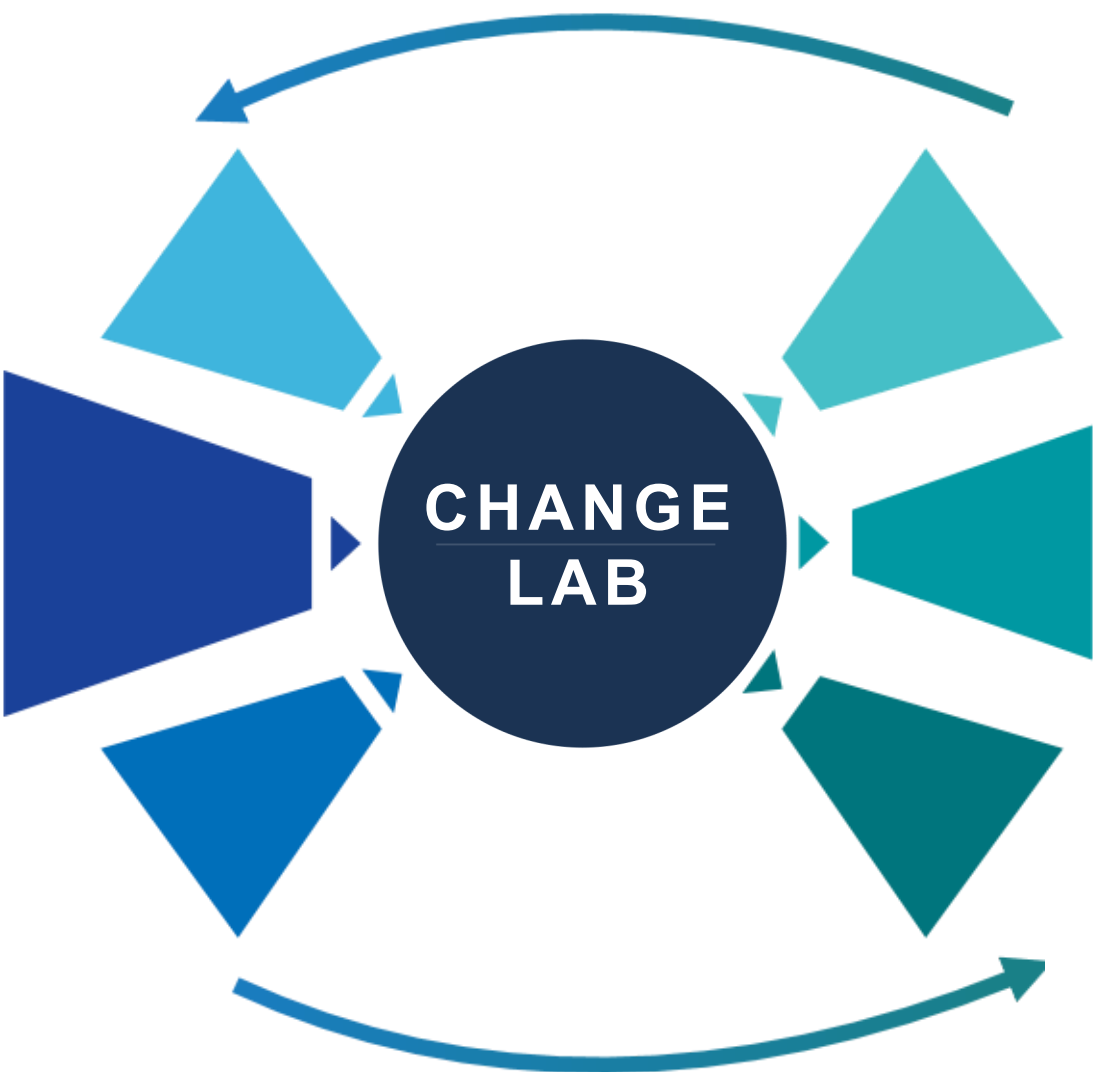
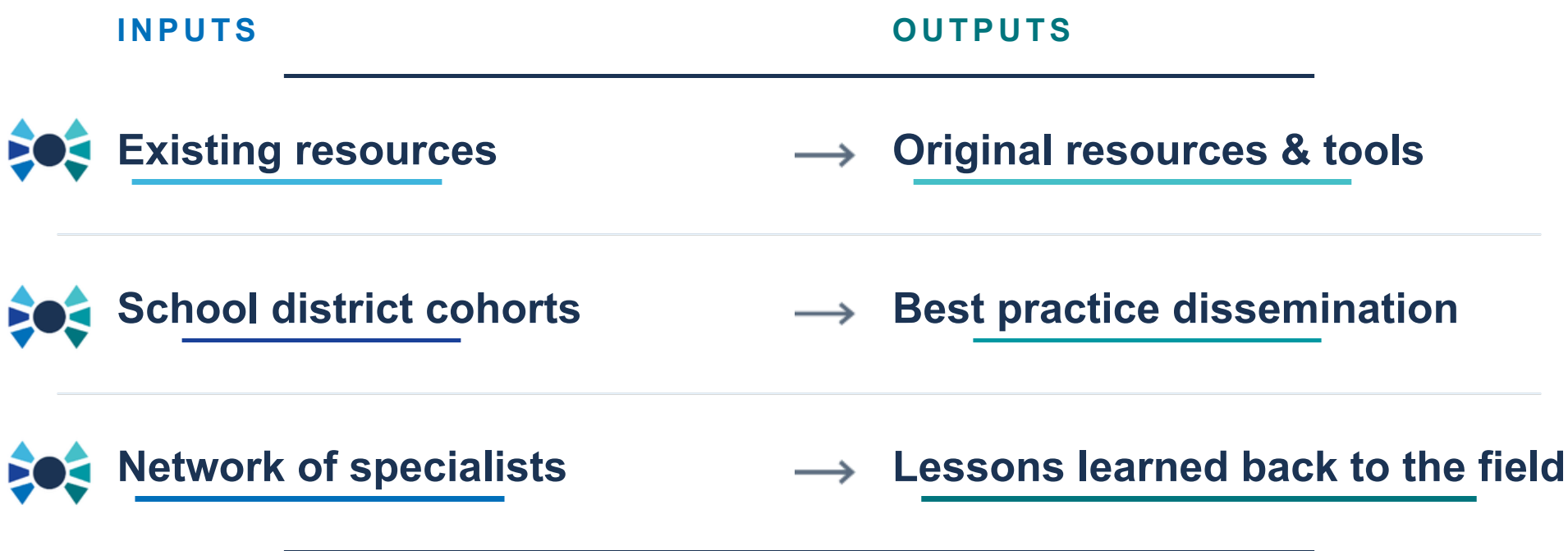
A cohort model. Districts of similar size and context, facing the same decision, learn from each other and from those a step ahead.

“We don’t always trust being sold to by vendors.”

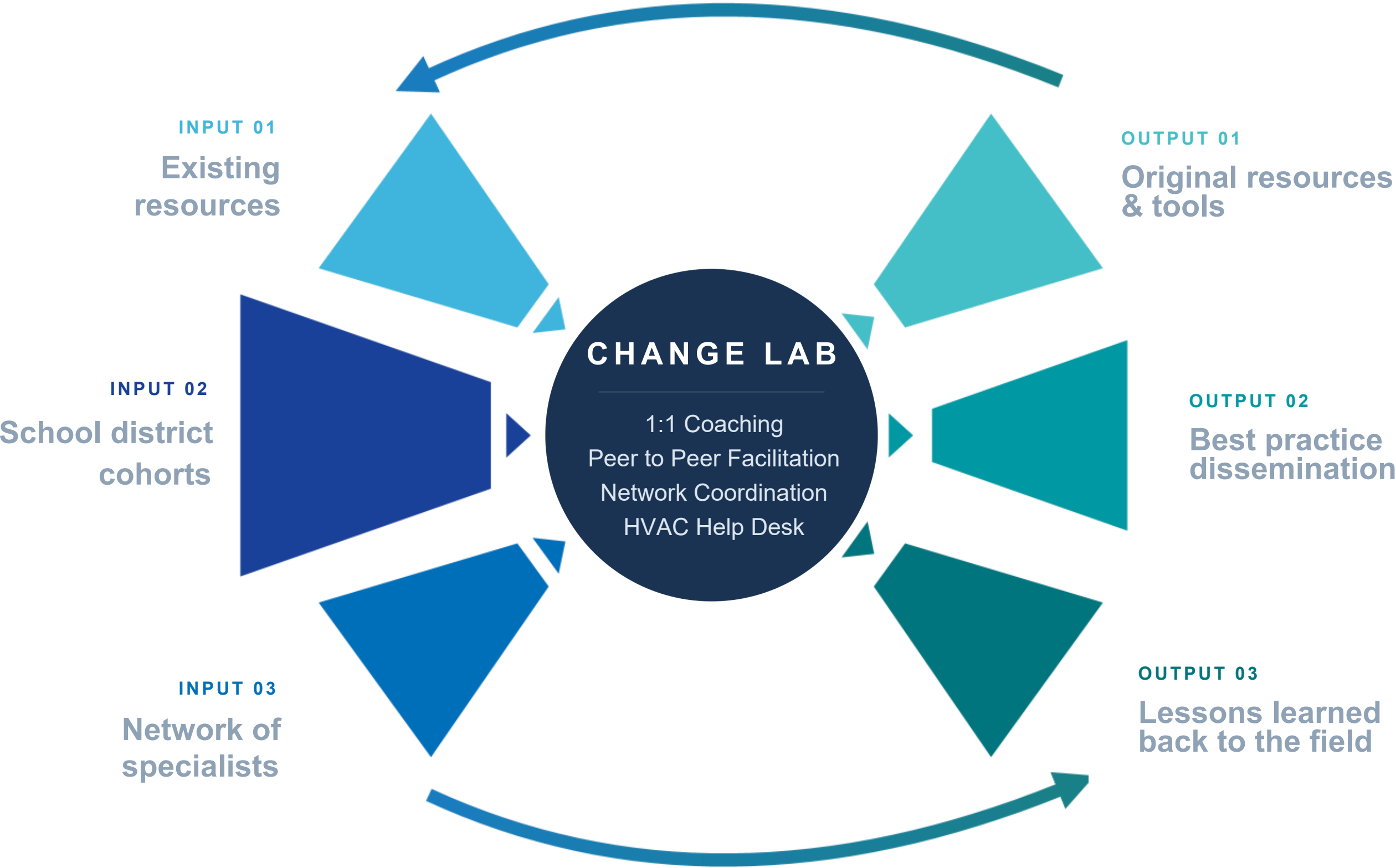


Vendor-neutral by construction. Philanthropy funds the technical assistance; industry underwrites only the tools, and we hold the pen.

THREE INPUTS, THREE OUTPUTS



THREE INPUTS, THREE OUTPUTS



WHY HVAC FIRST

The demand is already proven. The need is measurable. The fix moves learning.

36%

of U.S. school buildings, roughly 36,000 schools, need HVAC updates or replacement

~14,000

Existing schools that were built without AC that now now need it

#1–2

HVAC ranks in the top bond categories every year since 2015, first or second in six of the last eleven, including 2024 and 2025

~40-50 yrs

average age of the main instructional building; 40% of schools were built before 1980

\$34B

annual maintenance and operations shortfall, a gap of \$5.01 per square foot each year

\$56B

annual capital investment shortfall, a gap of \$1,526 per student each year

~14M

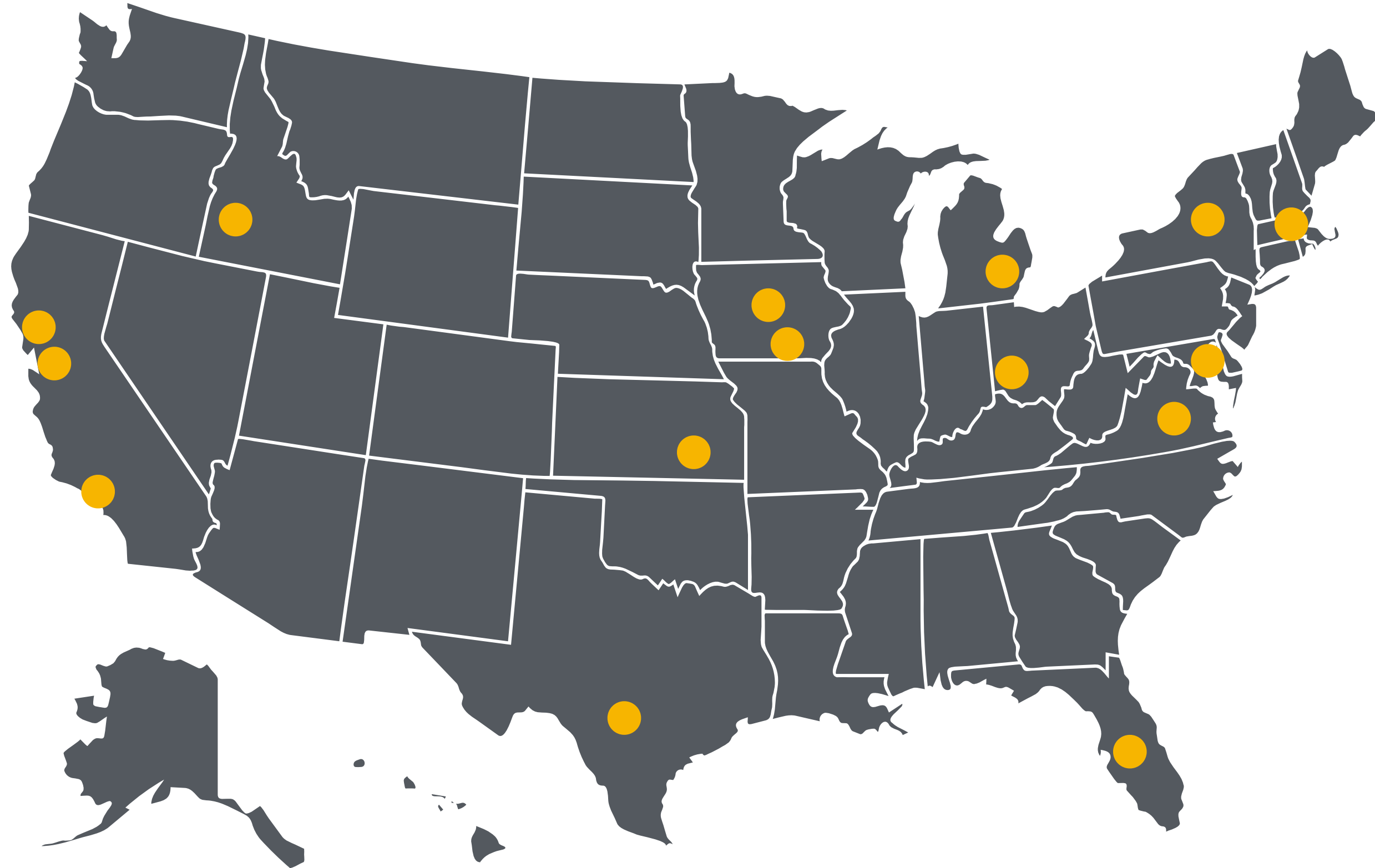
school days are missed each year to asthma, and poor indoor air quality is a primary driver. The two shortfalls above compound into the \$85B annual facilities gap, and students pay it in lost days.

Solvable, measurable, high-need. Air and temperature are the inputs proven to move health and learning, and districts are already voting to fund the work. What can be limiting factors and barriers is the coordination and capacity, not technology. Proving the model here with HVAC means it can extend to every other infrastructure challenge schools face.

Sources: GAO-20-494 (2020); SchoolBondFinder / The Amos Group (2015-2025), category frequency; State of Our Schools 2025 (21CSF); Healthy Schools Campaign (2022). Gap figures are annual averages in 2024 dollars.

2026-27 DISTRICTS!

- Ann Arbor Public Schools, MI
- Ashland Public Schools, MA
- Boise Public Schools, ID
- Boston Public Schools, MA
- Canajoharie Central School District, NY
- Davis County Community School District, IA
- Frederick County Public Schools, MD
- IDEA Public Schools, TX, FL, OH
- Long Beach Unified School District, CA
- Oakland Unified School District, CA
- Prince William County Public Schools, VA
- Sacramento Unified School District, CA
- Wichita Public Schools, KS
- Waukee Community School District, IA



2026-27 NETWORK PARTNERS!



WHAT FLOWS IN

01 Existing resources · 181 resources

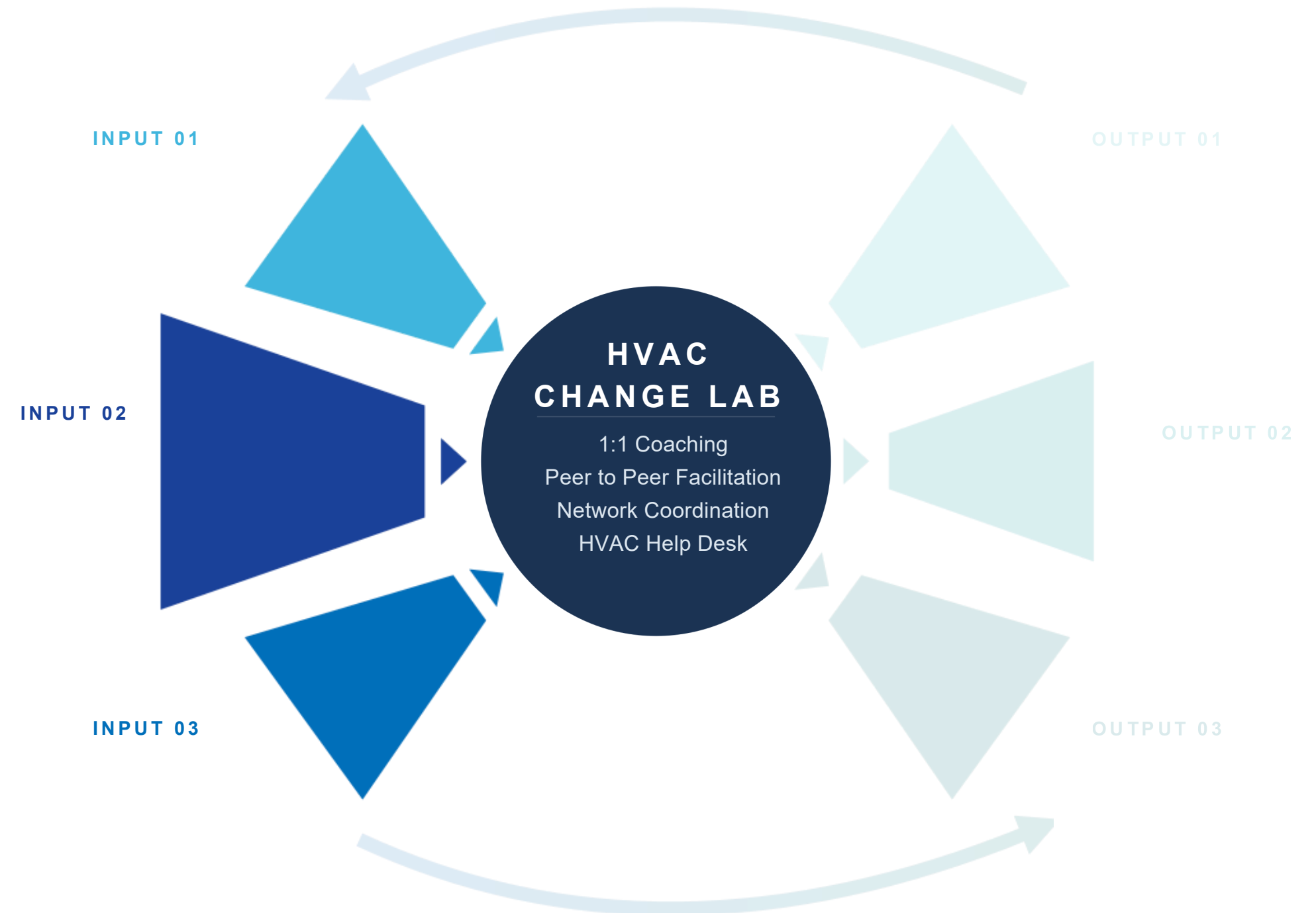
Field-tested tools curated, not reinvented: the K-12 Decarbonization Roadmap, the Efficient & Healthy Schools Program, federal funding guidance.

02 School district cohorts · 14 districts, 11 states

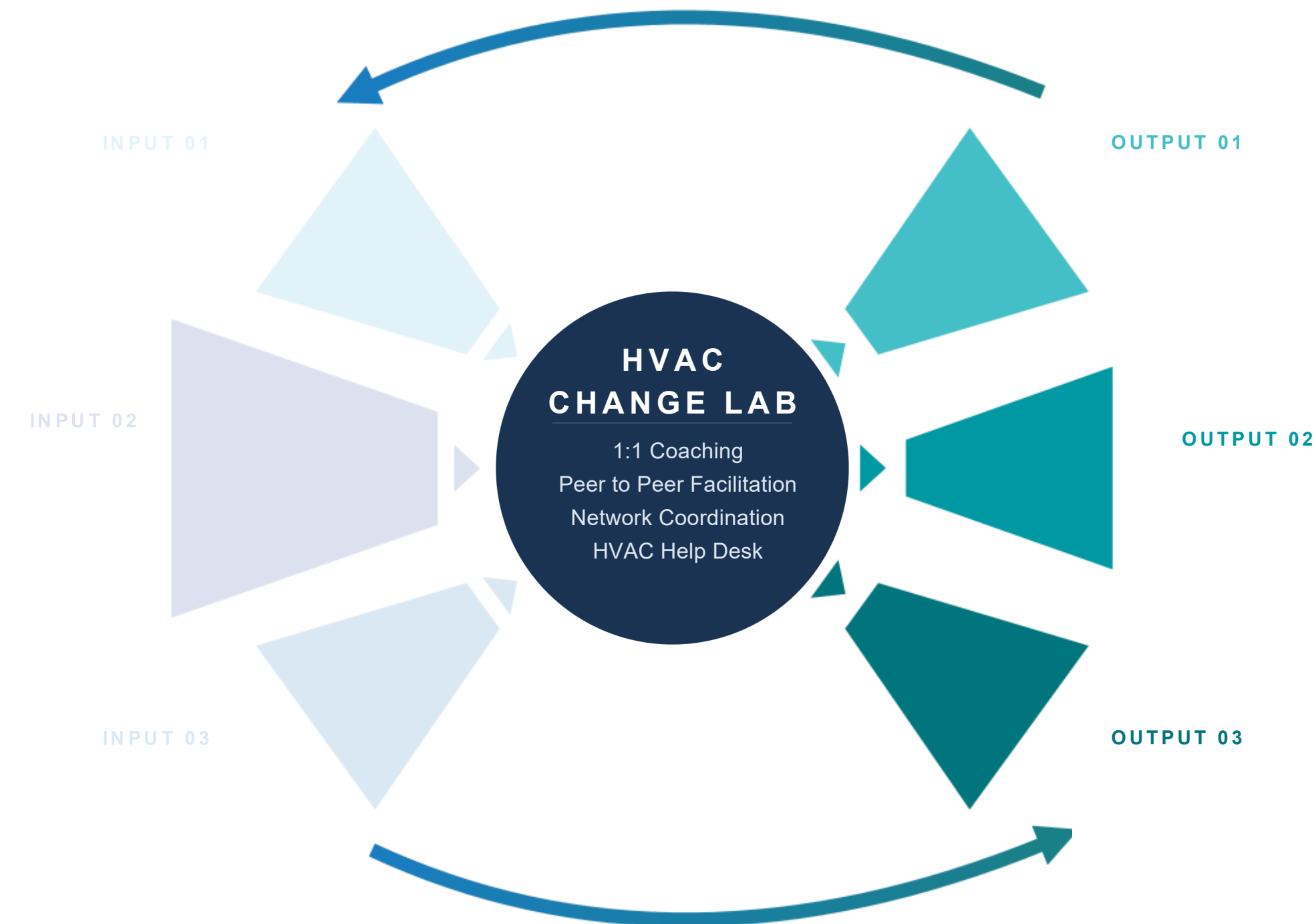
Ann Arbor MI, Ashland MA, Boise ID, Boston MA, Canajoharie NY, Davis County IA, Frederick County MD, IDEA (TX·FL·OH), Long Beach CA, Oakland CA, Prince William County VA, Sacramento CA, Waukegan IA, and Wichita KS.

03 Network of specialists · 11 impact partners

American Lung Association, ASHRAE, ASBO International, Energy Services Coalition, Go Green Initiative, Green Schools National Network, NAESCO, NASEO, National Council on School Facilities, NSPMA, and UndauntedK12, convened by the Center for Green Schools, NBI, and NCSI.



WHAT FLOWS BACK TO THE FIELD



01 Original resources & tools

A field-tested library of frameworks, standards, and best practices, built from what the cohorts surface.

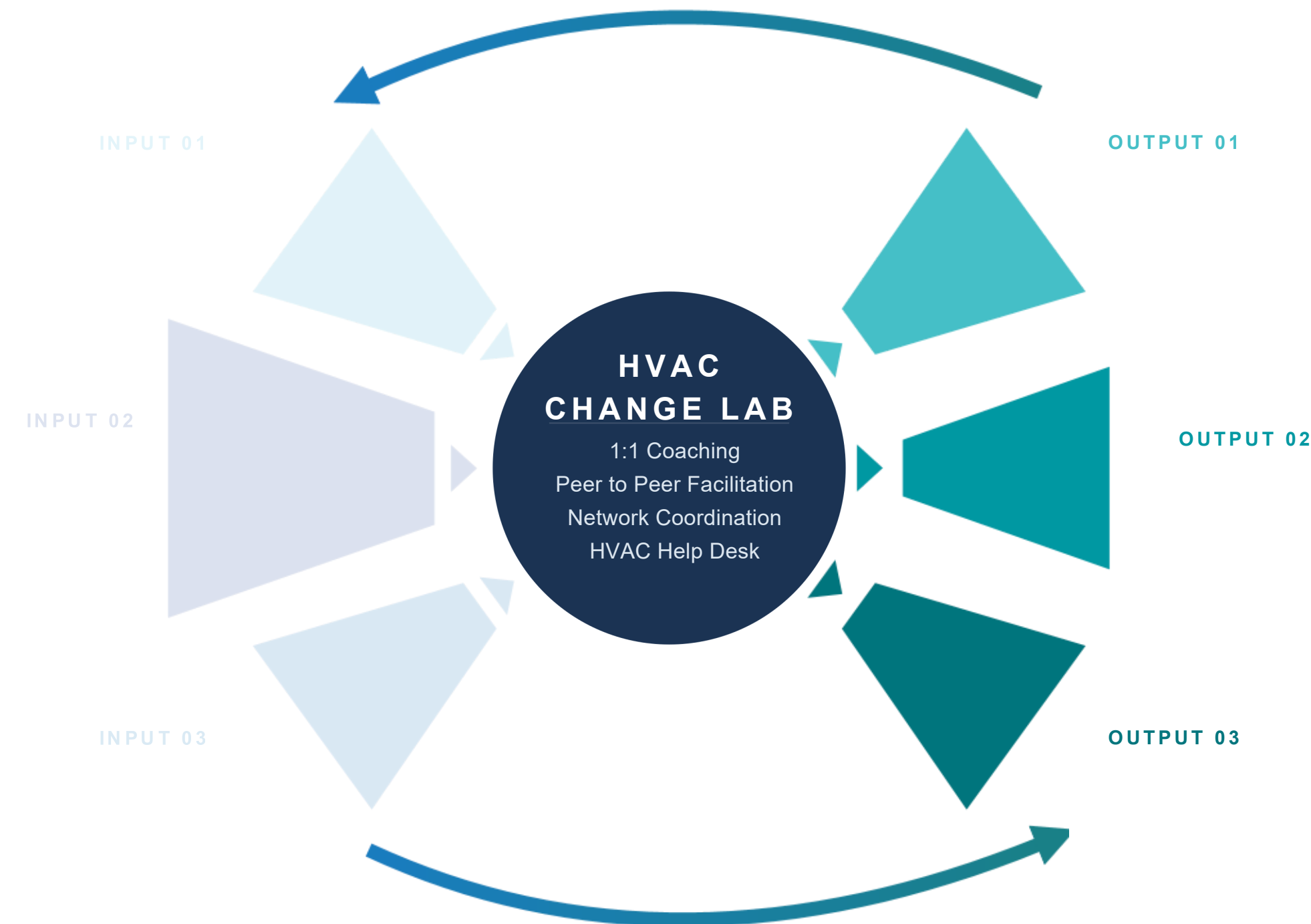
02 Best practice dissemination

Webinars, the Change Lab newsletter, and a growing national resource hub, carrying what works to district leaders nationwide.

03 Lessons learned back to the field

Evidence from each cohort flows back to sharpen the the tools, the standards, and the next cohort. The loop loop that makes the model compound.

OUTPUTS IN PRACTICE



01 Original resources & tools

11/13 districts don't have standard design language, language, so we are creating an OPR template tool.

02 Best practice dissemination

IDEA learning from peer districts on the benefit of, and and their experiences with, geothermal

03 Lessons learned back to the field

VRFs. Districts are struggling with this technology commonly due to installation and O&M issues.

The Change Lab Model is Transferable



INPUT 01

Existing resources

The K-12 Decarbonization Roadmap, the Efficient & Healthy Schools Program, and federal funding guidance: curated, not reinvented.

INPUT 02

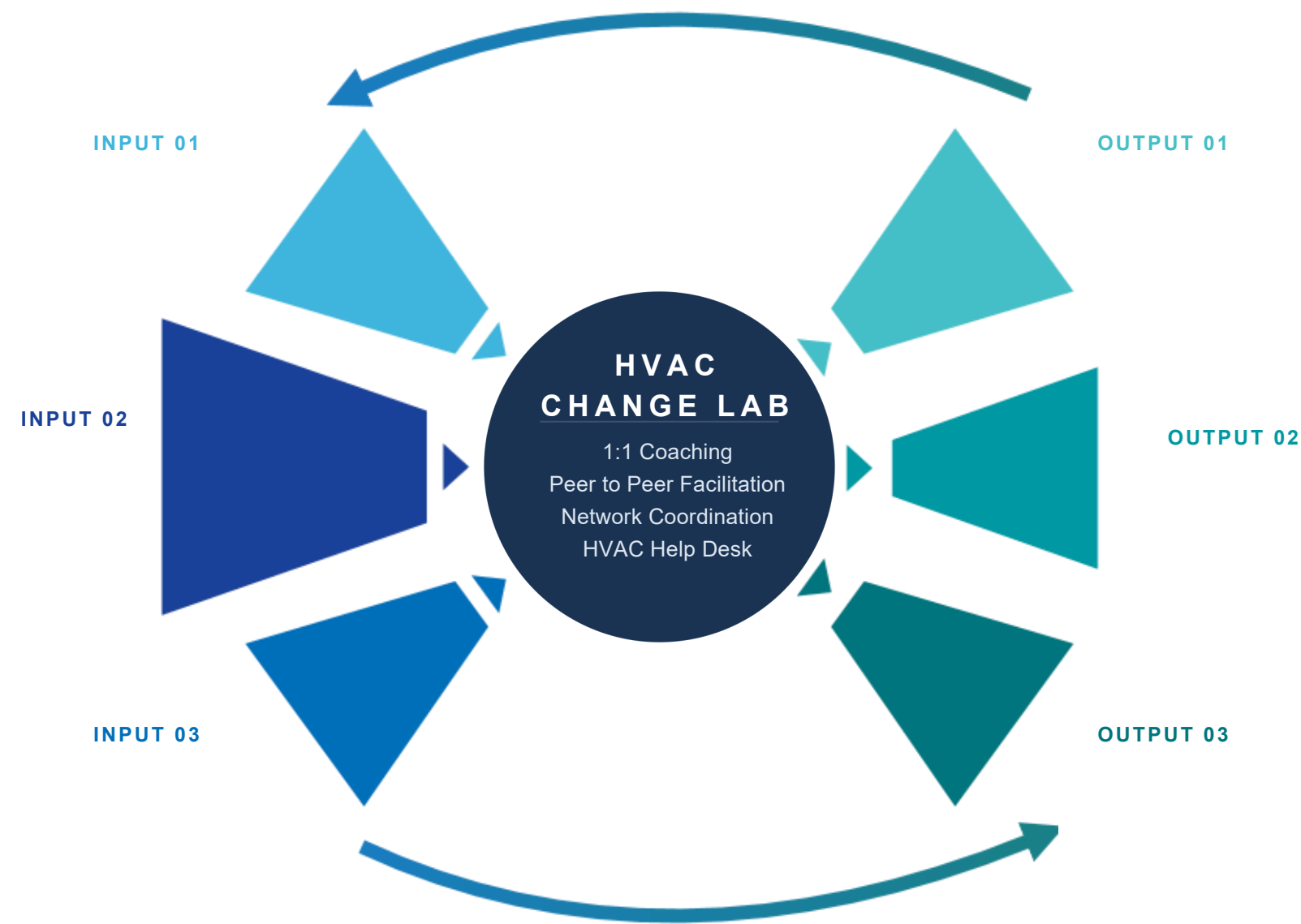
School district cohorts

13 pilot districts across 11 states, reaching ~496K students in the first cohort.

INPUT 03

Network of specialists

11 impact partners delivering 1:1 coaching and technical assistance to districts.



OUTPUT 01

Original resources & tools

A field-tested library of frameworks and best practices, built from what cohorts surface.

OUTPUT 02

Best practice dissemination

Webinars, the Change Lab newsletter, and a growing national resource hub.

OUTPUT 03

Lessons learned back to the field

Evidence from each cohort flows back to sharpen the tools for the next.

RESOURCE HUB

- The National Center on School Infrastructure is serving as the resource hub for the Change Lab
- Explore the growing library via school-infrastructure.org/about-us/hvac-change-lab/
- Submit a recommendation for a resource to include in the library!



National Center on
School Infrastructure

Why Facilities Matter

Topics ▾

Library ▾



Filter by:

Sort by:

Date (Recent First) ▴ ▾

Search within results



Content Type

☒ Resource

Categories ▴

☐ Article

☐ Case Study/Exemplar

☐ Dataset

☒ Guide/Tool

☐ Research/Report

☐ Resource Hub

☐ Blog Post

Categories ▴

☐ Ask the expert

☐ Resource spotlight

☐ Update from NCSI

☐ Voices from the field

Topic

☐ Capital Planning and Construction

☐ Community and Neighborhood Connections

Sub-topics ▾

☐ Data and Information

Sub-topics ▾

☐ Design

Sub-topics ▾

☐ Energy Use and Efficiency

Sub-topics ▾

MORE +

Refining by:

RESOURCE X

GUIDE/TOOL X

HVAC X

[Reset](#)

Displaying 1 - 10 of 21 results

● RESOURCE - GUIDE/TOOL

Ground-Source Heat Pumps: A Modern HVAC Choice

UndauntedK12

Ground-source heat pumps are an affordable and reliable alternative to legacy heating and cooling technology. Designed to be easily shared with stakeholders and project teams, this one-pager provides an overview of the opportunity to use tax credits to cover the costs of the system and a link to Undaunted's resource hub on ground source heat...

Energy Use and Efficiency

● RESOURCE - GUIDE/TOOL

Ground-Source Heat Pumps in Schools: A Guide to Maximizing Energy Tax Credits

UndauntedK12

Designed for school districts and project teams already exploring ground-source heat pump projects, this guide outlines how to maximize energy tax credits with key strategies, tips, and resources from the planning stage to the filing process.

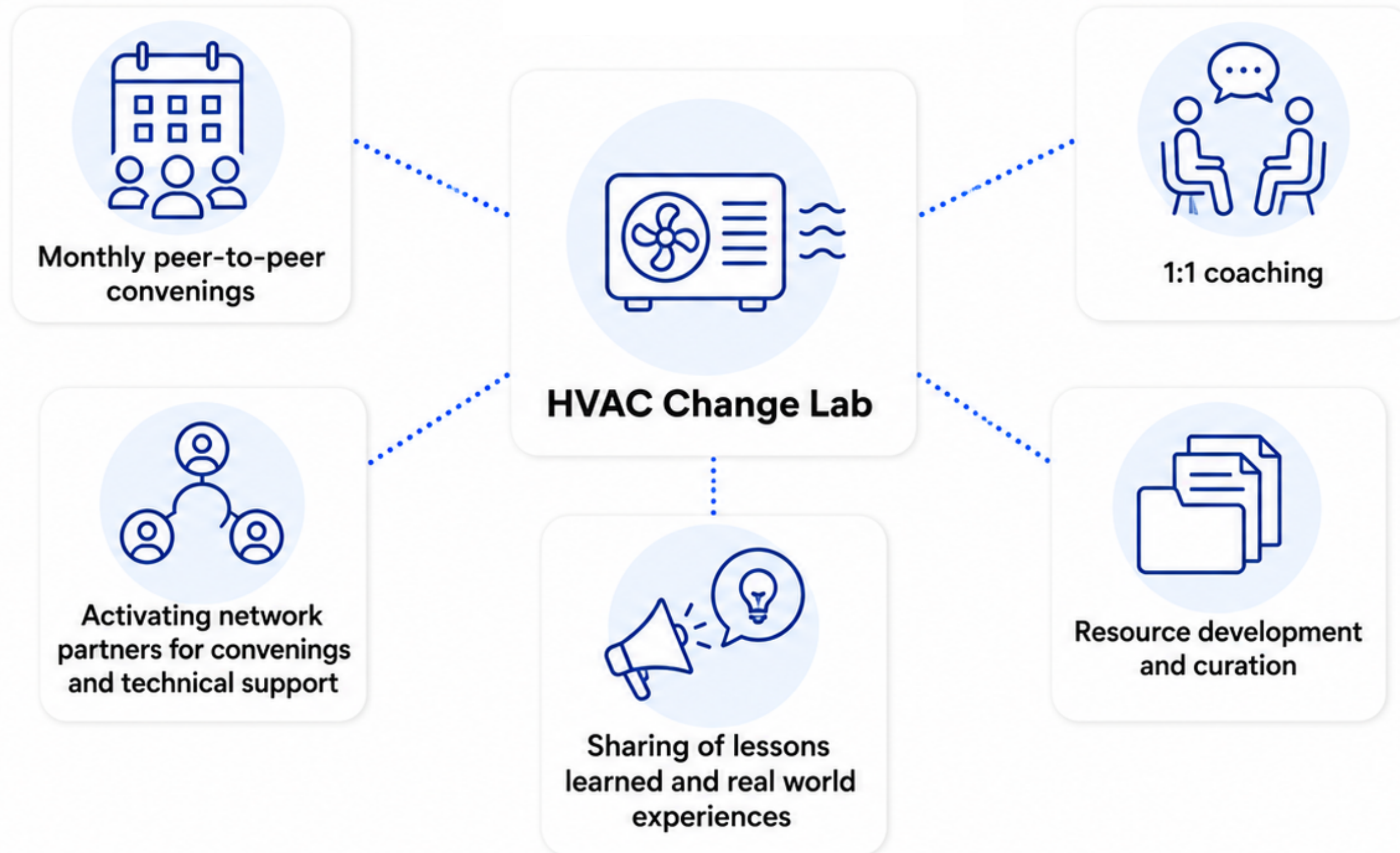
Heating and Cooling

● RESOURCE - GUIDE/TOOL

Webinar: Why and How School Facilities Matter for Student Success

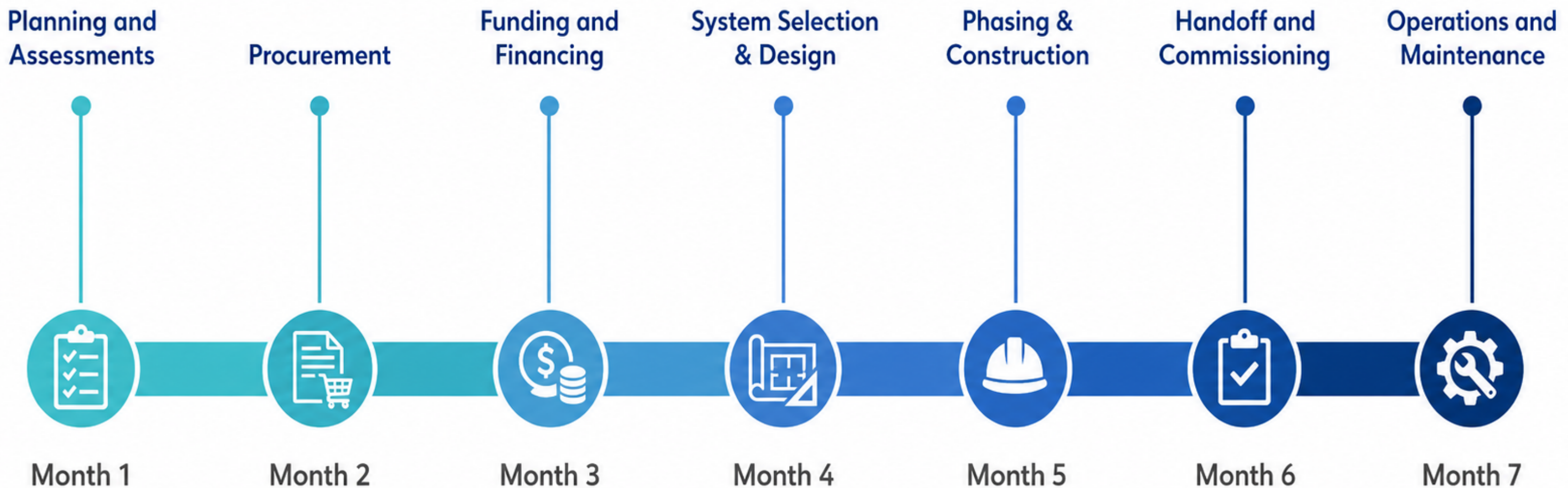
National Center on School Infrastructure (NCSI)

HOW THE HVAC CHANGE LAB SUPPORTS THE K-12 SECTOR

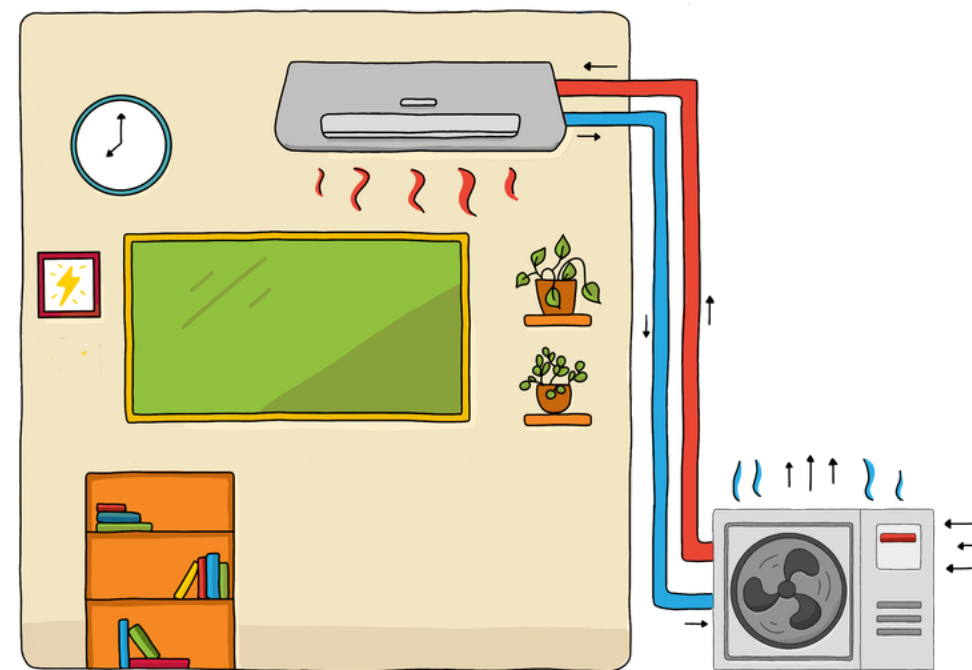


WHAT EACH MONTH LOOKS LIKE

- Monthly topical discussions with districts and partner
 - Districts every month
 - With partners every other month
- 1:1 coaching and capacity support

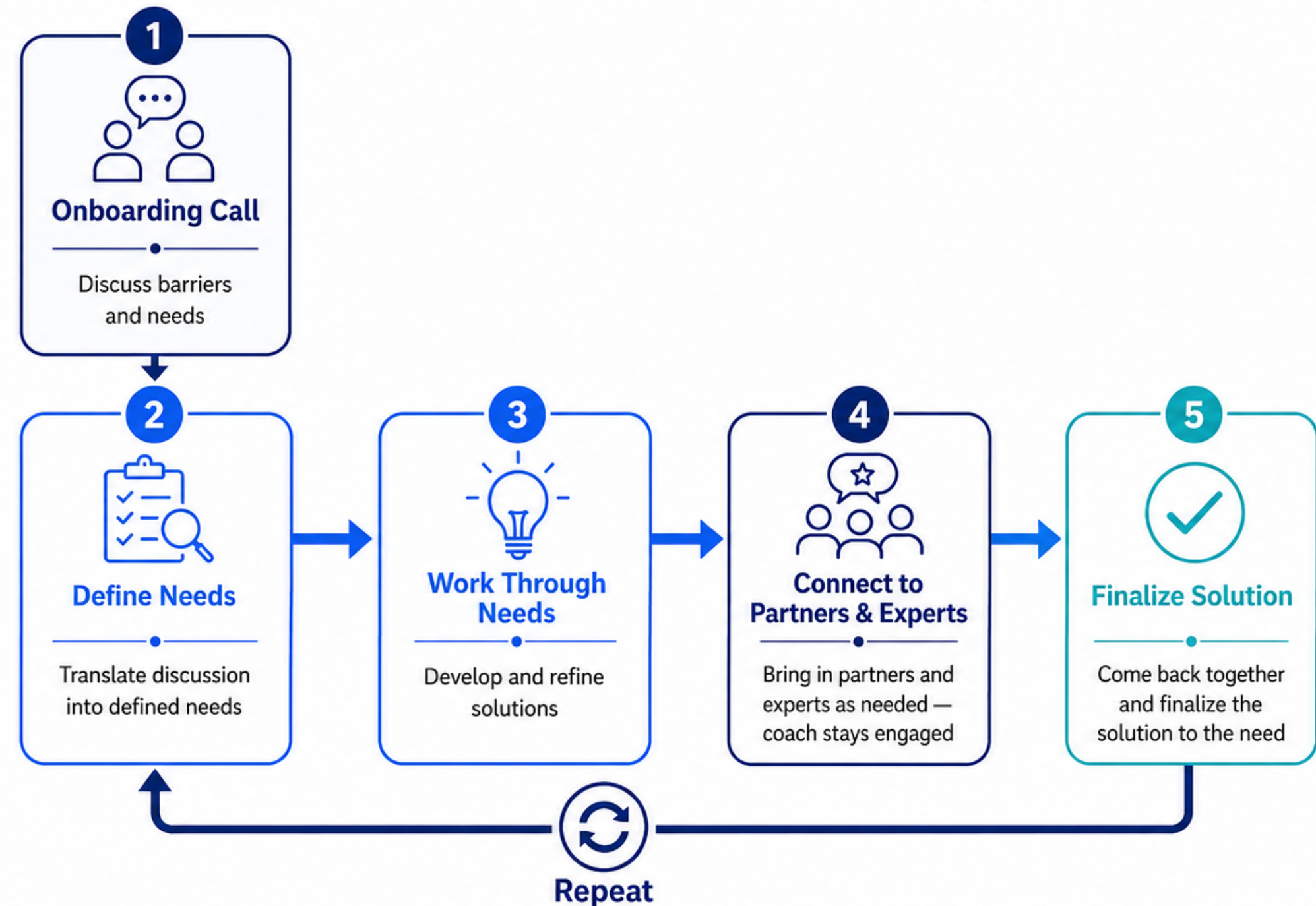


The key is creating an ongoing support cycle that adapts to district needs and connects them with the right peers, coaches, and experts.



COACHING AND TECHNICAL ASSISTANCE TO ADDRESS BARRIERS

- Meet districts where they are to uncover capacity and technical needs.
- Examples:
 - Technical specification development
 - HVAC operational specs
 - Funding and grant writing support
 - Trainings on specific systems
 - Prioritization and planning
 - Sometimes just a verbal processing session :)



HOW THIS TRANSLATES INTO SOLUTIONS FOR YOU ALL

- Resources and templates developed (and posted on NCSI)
 - Project Specifications toolkit
 - Owners project requirements
 - RFP
 - other spec templates
 - HVAC Selection Tool
- Trainings on HVAC solutions and systems
- Sharing lessons learned and best practices

STRONG SCHOOLS INITIATIVE
INTERACTIVE MOCKUP

Schools HVAC Upgrade Tool

A tool for schools to evaluate HVAC system upgrades that would provide value for their buildings — see which replacement options fit your building and what they could mean for energy, carbon, and cost.

DRAFT

STEP 1
Tell us about your building
Fields marked optional can be skipped — they help us fine-tune and scale the results.

ZIP CODE
11213
Used to determine your climate zone. Climate-zone lookup coming soon in the full tool.

BUILDING TYPE
Higher Education

TOTAL BUILDING SF (optional)
56000
Scales results — e.g., we won't suggest a central plant for a very small building.

NUMBER OF FLOORS (optional)
5

AGE OF EXISTING HVAC
Installed in the 1990s
Compared against typical equipment useful life.

FUEL TYPE — COOLING
Select...

FUEL TYPE — HEATING
Select...
Gas
Electric
Fuel Oil
Steam

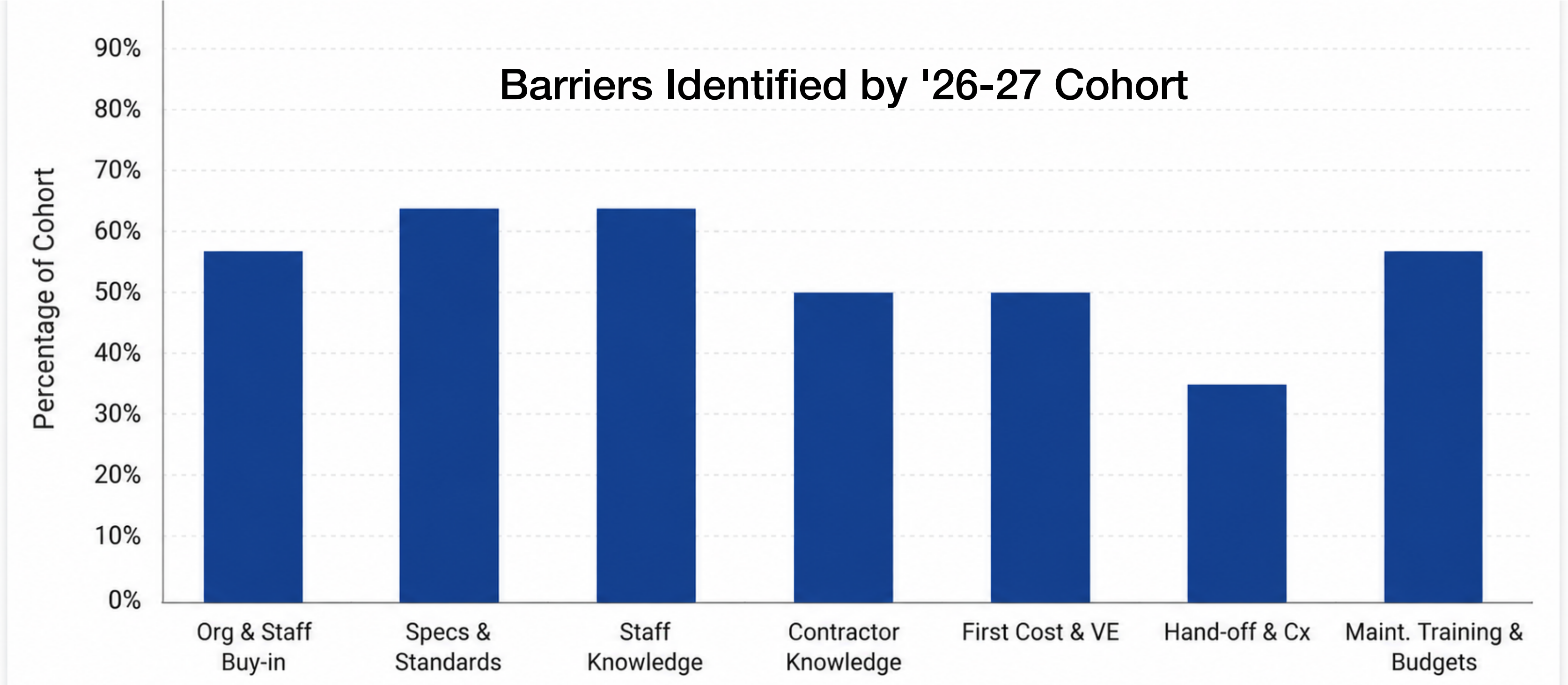
CURRENT PRIMARY HVAC SYSTEM
Select...

TELL US A BIT MORE ABOUT THAT SYSTEM
Choose a primary system first...

ARE YOU OPEN TO A MAJOR RENOVATION?
☐ Yes — I am open to a major renovation project: show me the most impactful measures.
☐ No — I am only looking for an equipment replacement at this time.

Show me options

WHAT WE'VE HEARD FROM THE COHORT



What barriers do you think are most important to address?

SCHOOL DISTRICT HIGHLIGHT

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IDEA PUBLIC SCHOOLS



Facilities

IDEA Public Schools HVAC Change LAB

Antonio Guevara
Director of Energy Services

Webinar, July 21, 2026

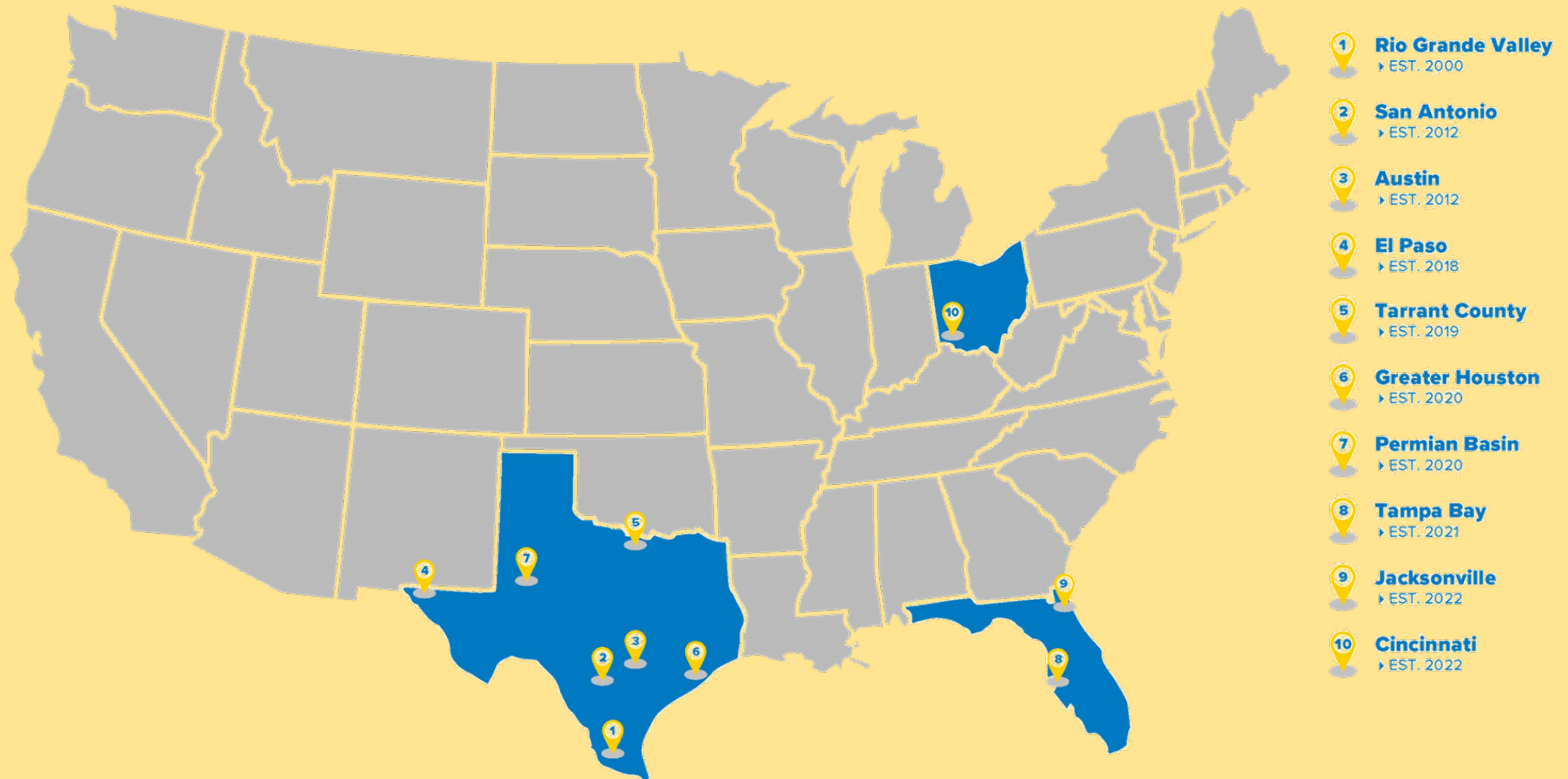


SINCE 2000, IDEA PUBLIC SCHOOLS

has grown from a small school with 150 students to a network of tuition-free, K-12 public charter schools in the United States. Currently, the network serves over 80,000 college-bound students in 143 schools across Texas and its affiliates. IDEA has been recognized as a “Great Place to Work” and received national rankings in The Washington Post and U.S. News & World Report’s Top High Schools lists. In the last 16 years, IDEA has sent nearly 100% of its graduates to college and remains on track to uphold that legacy.



IDEA Public Schools – Campus Locations



IDEA is Evolving.

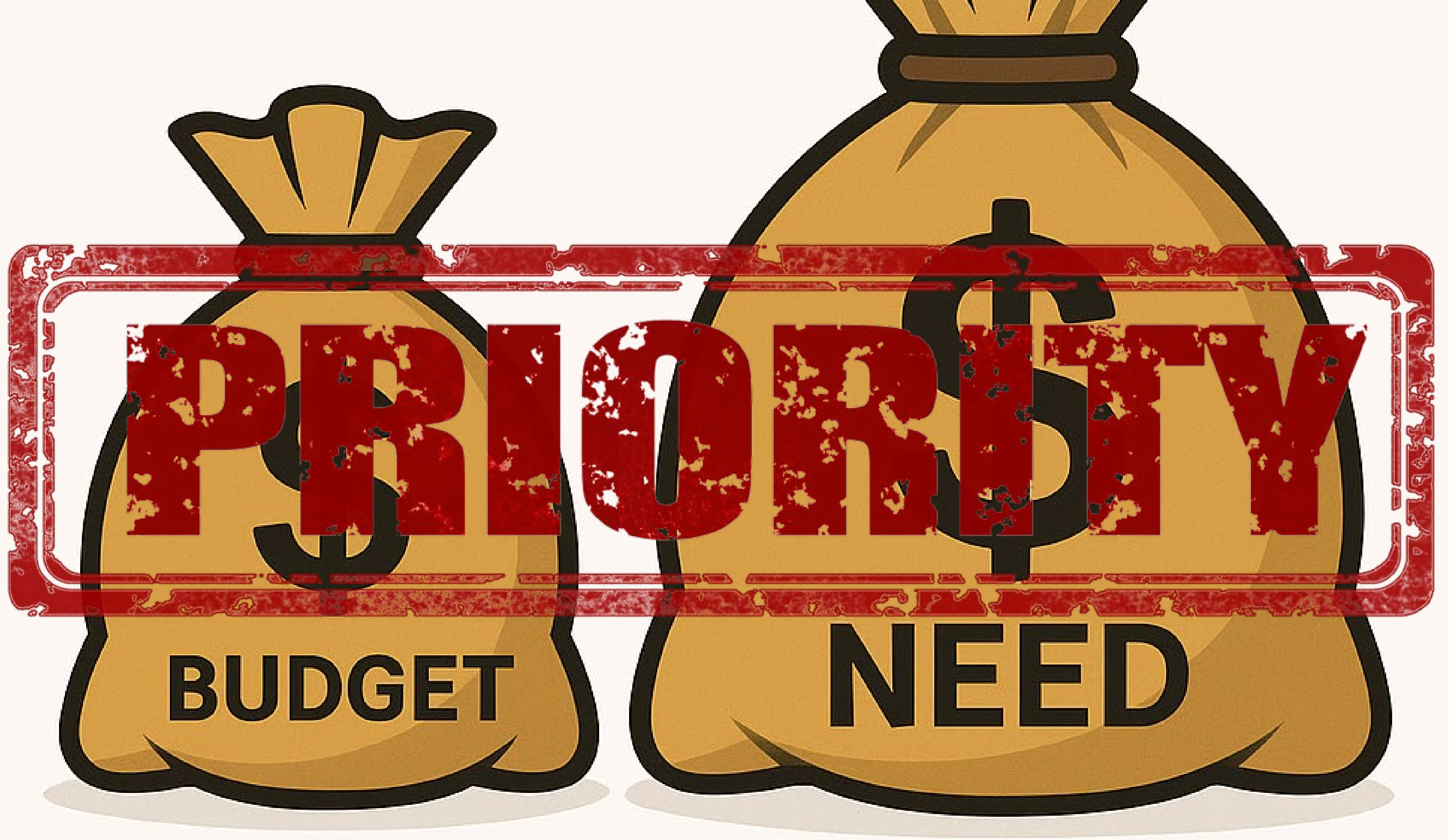
The 2035 plan isn't just new priorities. It's an acknowledgment that we outgrew ourselves. We grew fast—and some things broke. That's not comfortable to say. But it's true, and at IDEA, we all know it.



FACILITIES CONDITION ASSESSMENT

STARTING THE PROCESS

- In 2021 IDEA Public Schools hired PBK Architects, Inc. to conduct a Facilities Assessment of all IDEA Campuses.
- A comprehensive Facilities Condition Assessment (FCA) includes assessing current facility *conditions, deficiencies, needs, and equity* items.
- Facilities Assessments help *guide life-cycle needs, facility planning, and future capital investments*. In this case a 10-year plan.
- PBK will provide IDEA Public Schools with both an *online database* of assessment items for all campuses, and an *overall report* at the conclusion of the Facility Assessment process. The database and report will include assigned priorities and costs to each noted line item.



PRIORITY

BUDGET

NEED

Why Did we Join the HVAC Change LAB?



We wanted to learn
from the best



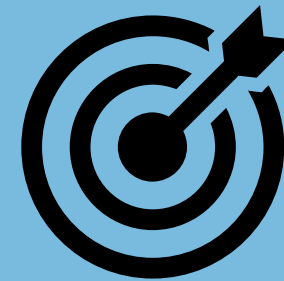
We manage facilities for
nearly 87,000 students



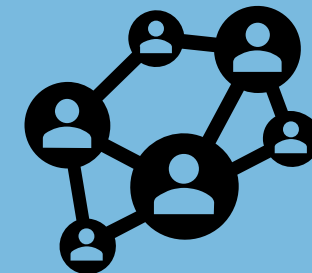
We wanted independent,
objective information



Every dollar we save on
energy can be redirected
to students

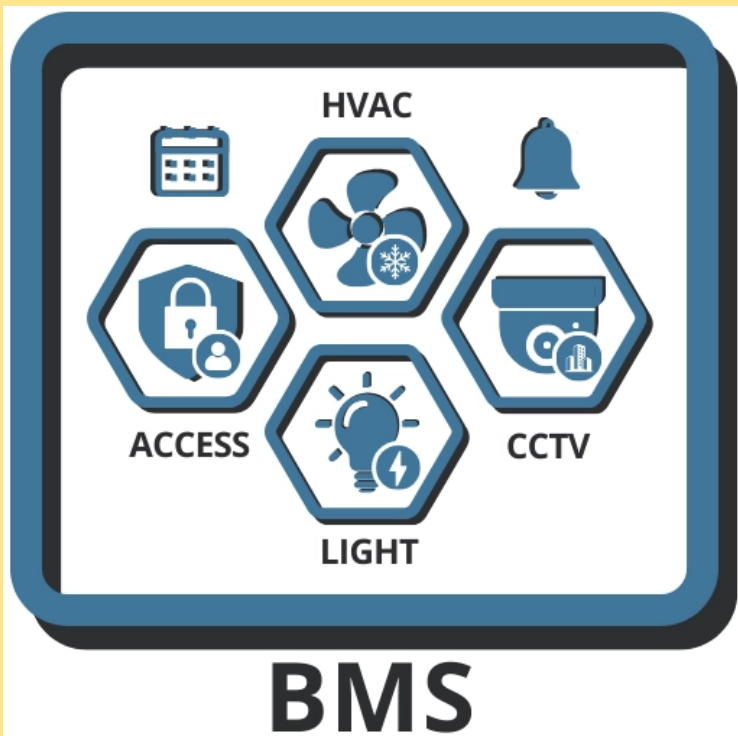


We are planning
decades ahead —not just
fixing today's problems

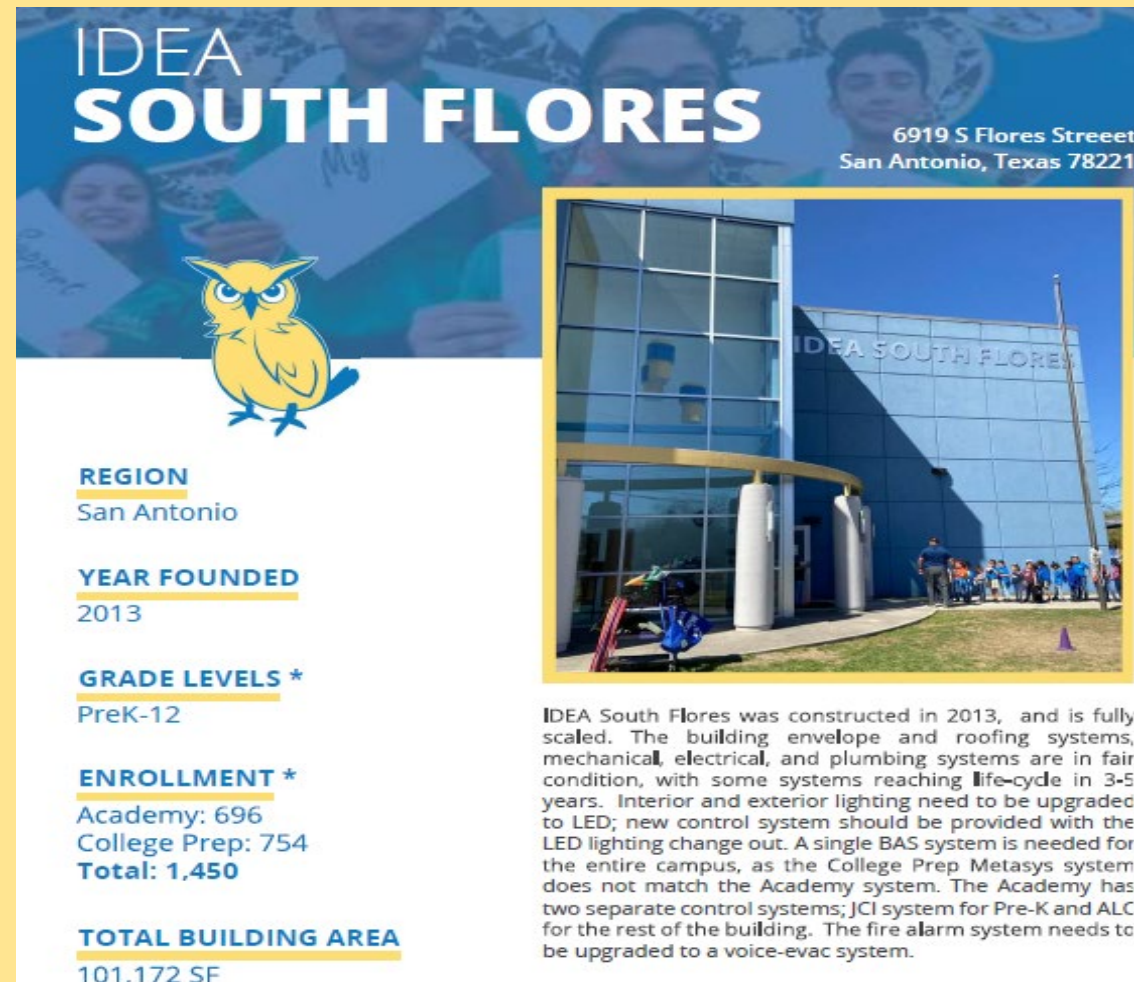


We wanted to share —not
just receive —knowledge

Current Challenges/Priorities:



IDEA South Flores – Case Study

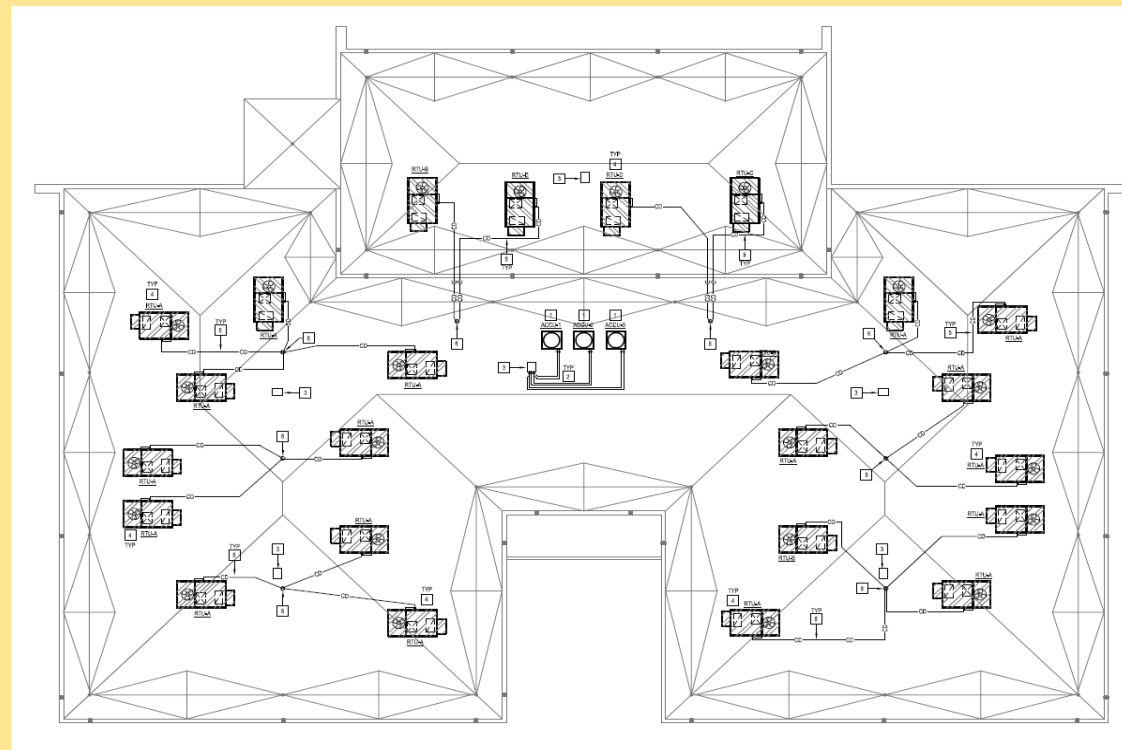


Existing HVAC System:

- 24 Lennox 4-ton packaged rooftop units (RTUs) providing electric cooling, gas heating, outside air ventilation, and BAS integration.
- Existing RTUs are nearing end of useful life requiring evaluation of long-term replacement strategies.

Change Lab Initiative:

- Evaluating Ground Source Heat Pumps (GSHP) as a potential long-term replacement strategy to improve energy efficiency, reduce operating costs, and enhance sustainability.





Thank You

For your Attention!

antonio.guevara@ideapublicschools.org

www.ideapublicschools.org

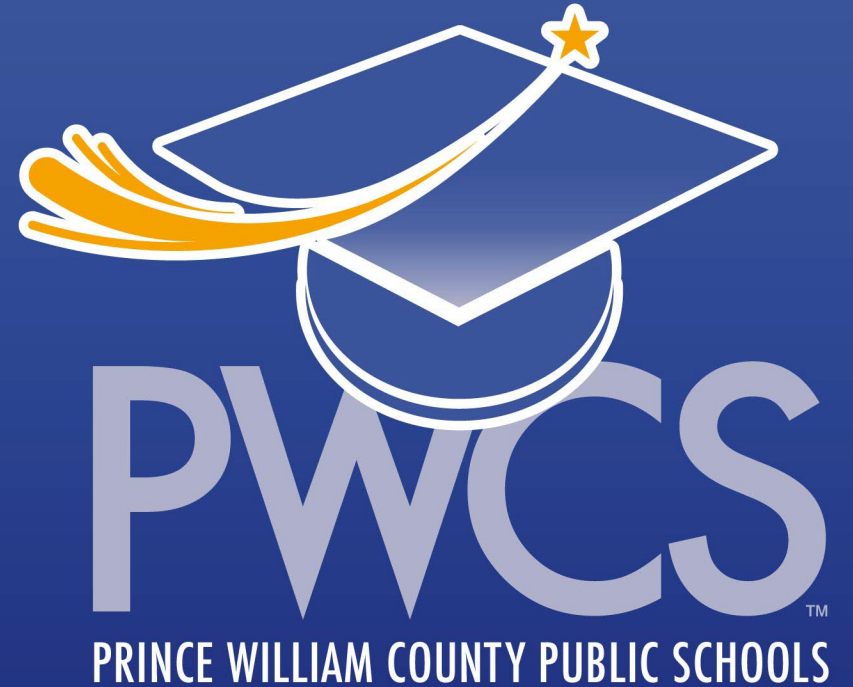


SCHOOL DISTRICT HIGHLIGHT

--

PRINCE WILLIAM COUNTY SD

HVAC Change Lab



Virginia's
2nd
Largest
School District

90,000+
Students

100+
Schools & Centers

Energy Use
850,000
MMBtu

Energy Costs
\$ 21.5
Million

Water Costs
\$ 2.94
Million

PWCS *by the Numbers*





STRATEGIC PLAN

Adopted February 2026



Commitment 2, Objective 2.3

PWCS facilities will be welcoming, safe, healthy, and sustainable.

This will lead to healthier, more sustainable, and more engaging learning environments that support student success.



Emissions Reductions

*25% reduction from
SY 2018-19 baseline*

Energy Use Intensity

*Reduce EUI 15% from
SY 2023-24 baseline*

Indoor Air Quality

*Real-time monitoring
in all schools*

Elevate 2030 *Sustainability Goals*

- Alternative fuel fleets.
- Expand solar to 20 new sites.
- Outdoor Learning Environments.
- Waste Reduction.

**Transition to
low-GWP
refrigerants**

**Improve
maintenance
efficiency**

**Modernize
energy
infrastructure
for efficiency**



Our Journey

Where We've Been

- RFP Language
- Sustainable Design Principles for high-performance buildings
- Installed our first GSHP
- Commissioning
- Real-time energy monitoring to support energy audits

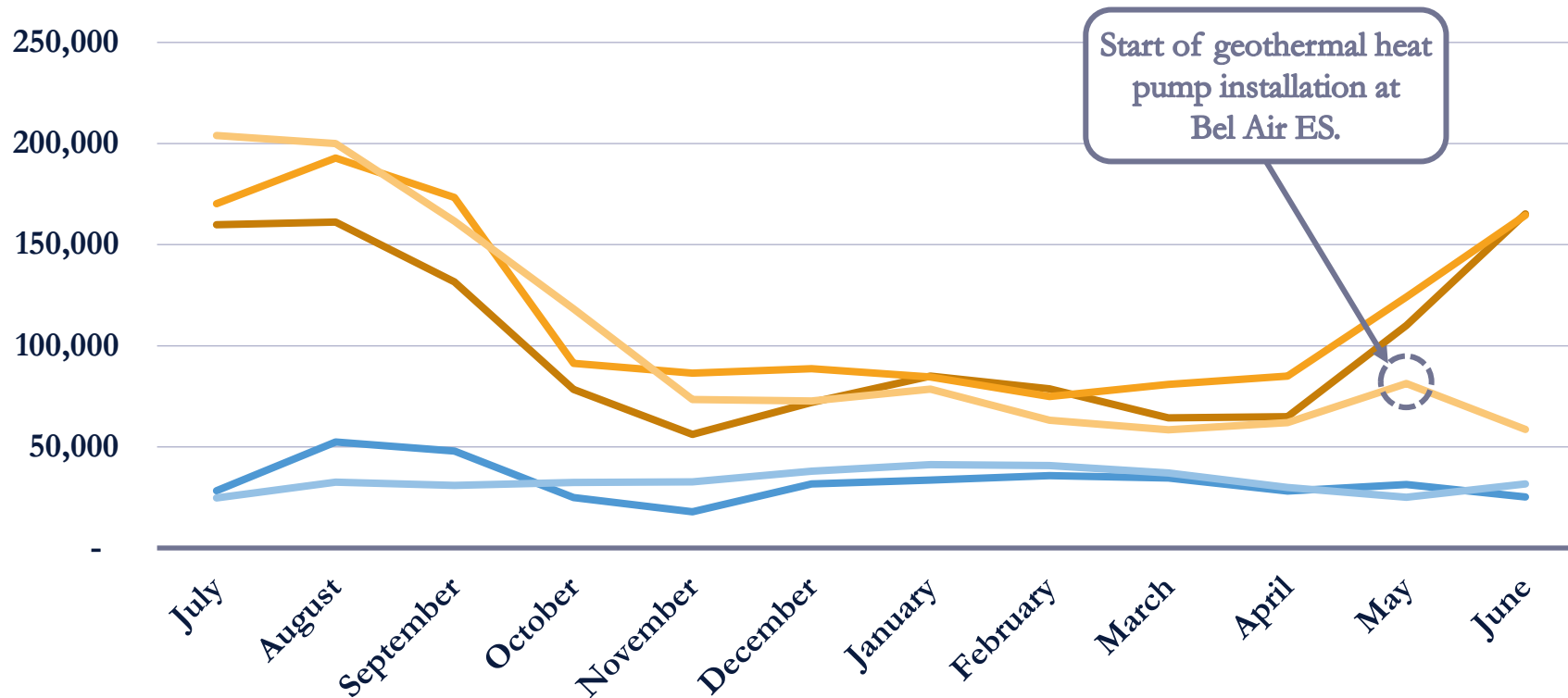
Where We're Going

- LEED v5 Scorecard
- Real-time IAQ monitoring
- Find + Fix Retrocommissioning
- Monitoring-based commissioning
- Data integration across platforms and tools to support data-driven decisions



Bel Air ES Geothermal Heat Pump Renovation

Electricity Use at Bel Air ES *kWh, normalized*

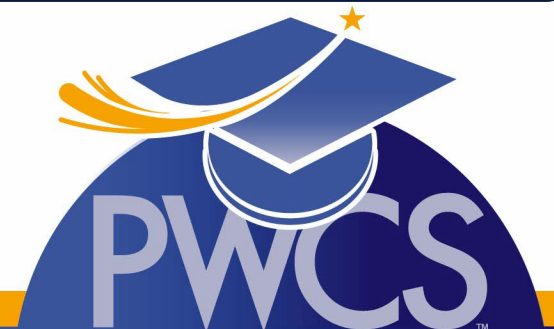


Electricity Consumption ↓ 69.5%

Energy Costs ↓ 65.2%

GHG Emission ↓ 70.3%

EUI 93.6 → 25.2



* Only considered September 2024 through August 2025 because the geothermal heat pump was not online for the full month of August.

^ Bel Air ES is an all-electric school, so electricity usage represents all their energy

Current & Upcoming Major HVAC Projects

GSHPs

- **Occoquan ES** – nearly complete
(whole school replacement on same site)
- **Vaughn ES** – active construction
- **Bull Run MS** – in design
- **Marsteller MS** – in design

Capital Improvement Plan

- **Pattie ES**
- **Neabsco ES**
(no existing piping, so GSHP more expensive)

Overall Approach

- Site-by-site feasibility study with life cycle cost analysis
- GSHP preferred where feasible and cost effective



Added Context: Energy Costs Are Increasing

YTD Changes in Consumption & Costs

(July 2025 – April 2026)

Commodity	Use	Unit Cost	Total Costs
Electricity	-4.1%	+13.4%	+8.8%
Natural Gas	+6.5%	+24.6%	+32.7%
Fuel Oil	-5.9%	+3.3%	+5.2%
Combined Water	-2.3%	+3.3%	+1.0%

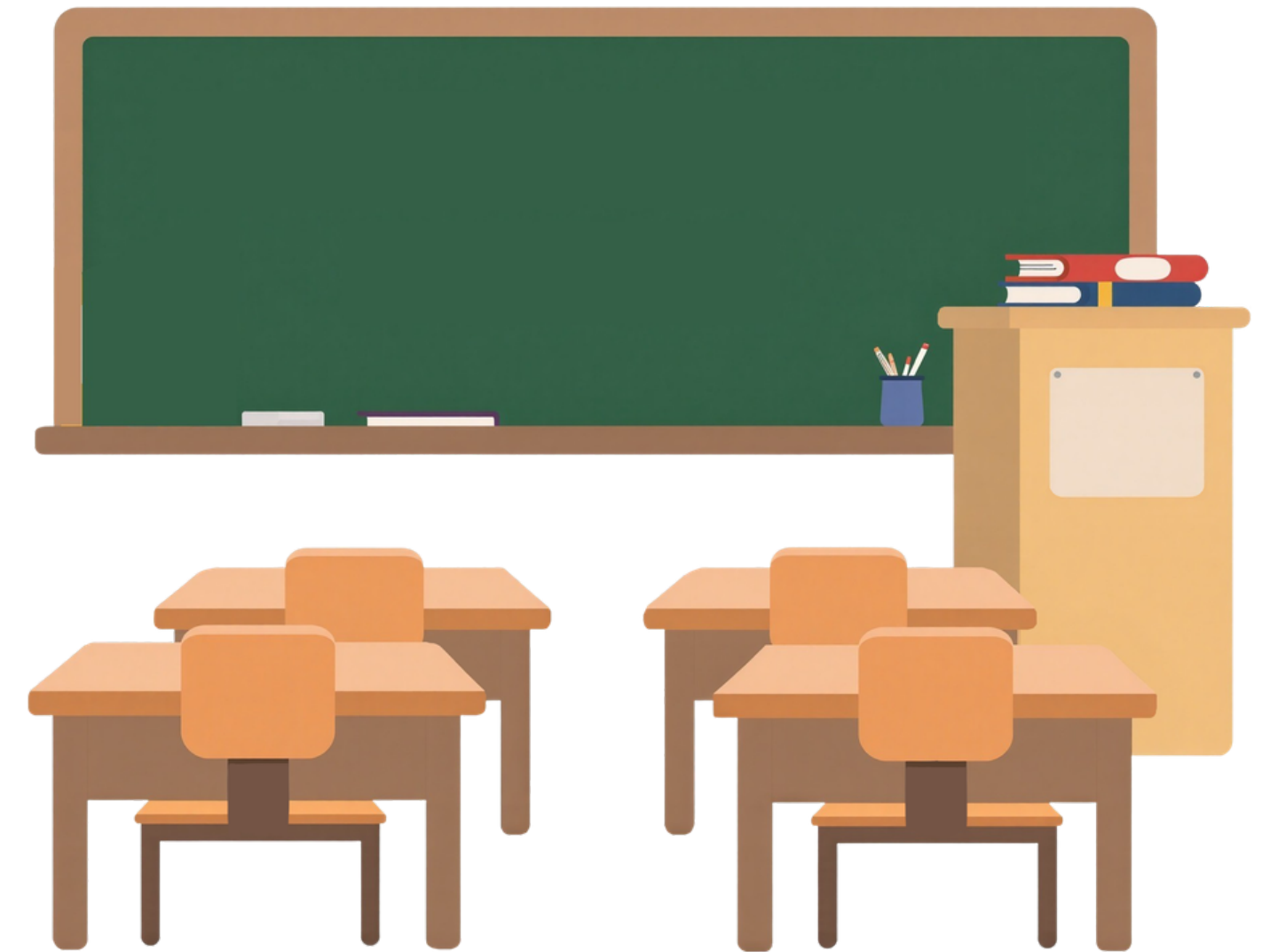
The best time to invest in energy efficiency was yesterday.
The next best time is now.



YOUR ROLE

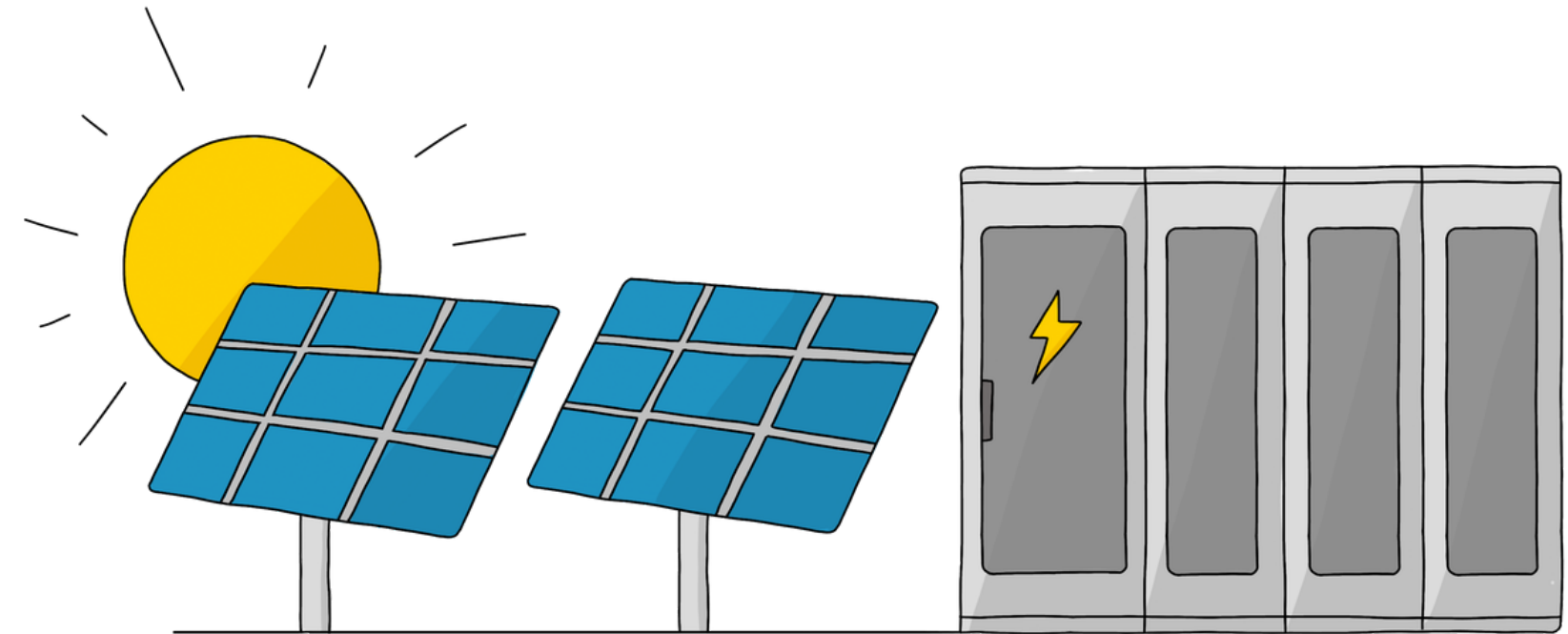
CALL TO ACTION

- Join our network
 - Schools, partner organizations, experts in the field, practitioners
- Tells us the challenges and successes you're seeing in this space
- Support the current and future Change Labs



NEXT STEPS

- Look out for the Change Lab Newsletter
- Read our first blog: Early Findings from the HVAC Change Lab
- Slides and recording will be shared
- Look forward to our next webinar in September



QUESTION & ANSWER