

Navigating Legislative Changes in Educational Design

A framework for architects and educators

A4LE LearningSCAPES 2024

October 18, 2024

ACCELERATE

Educational Designers



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Agenda

01 Global perspectives from COP28 – a sense of urgency

02 Understanding legislative changes

03 Case studies

04 Key takeaways

05 Questions and discussion



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Global perspectives from COP28 – a sense of urgency



Reframing perspectives



Design thinking beyond buildings.

Built environment intersects with all economic sectors offering new opportunities.

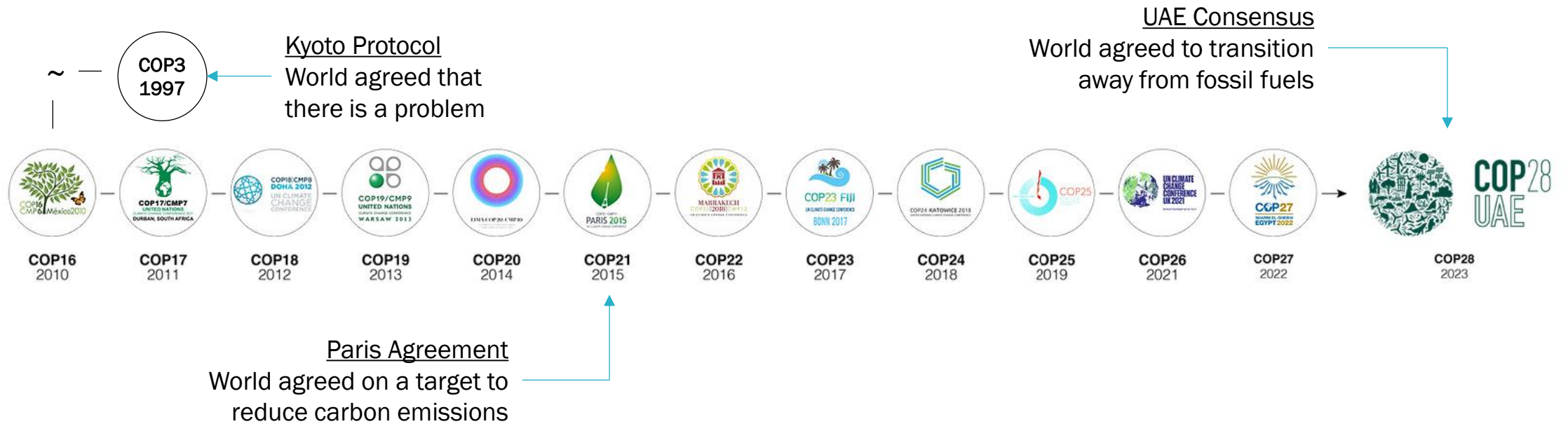
Explore all climate solutions, simultaneously.

Urgency to climate crisis drives innovation.

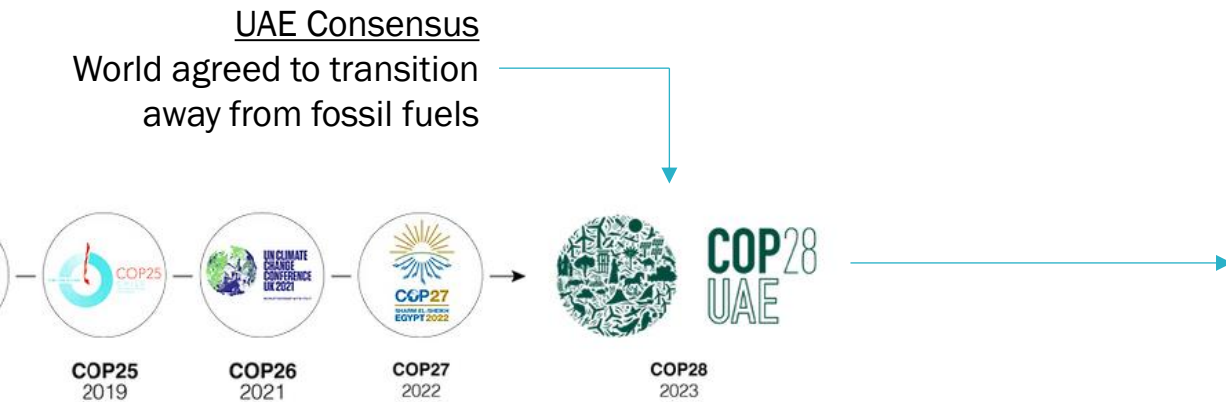
Climate finance is real.

Shifting perspectives from managing risk to pursuing growth.

Why are COP negotiations important?



Why do such agreements matter?



Provide an opportunity for Governments to **prioritize policies** around decarbonization and adaptation.

Bolster a **growing shift** from businesses across sectors toward decarbonization and decarbonization monetization (risk vs growth).

Direct **global investments** toward climate change mitigation and adaptation.

Buildings Breakthrough

*Near-zero emission
and resilient buildings
are the new normal
by 2030*



Buildings Breakthrough



By 2030

- The built environment should halve its emissions
- 100% of new buildings must be net-zero carbon in operation
- With widespread energy efficient retrofits well underway
- And embodied carbon must be reduced by 40%
- With leading projects achieving at least 50% embodied carbon reductions.

By 2050

- At the latest, all new and existing assets must be net-zero across the whole life cycle, including operational and embodied emissions.

It's happening!



Paris, 8 March 2024

The first ever Buildings and Climate Global Forum, organized by the French Government and the UN Environment Programme (UNEP), concluded with the adoption by representatives of **70 countries** of the **Declaration de Chaillot**, a foundational document for international cooperation that will enable progress towards a rapid, fair, and effective transition of the built environment.

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Understanding Legislative Changes



Landscape of legislation

Supply and demand

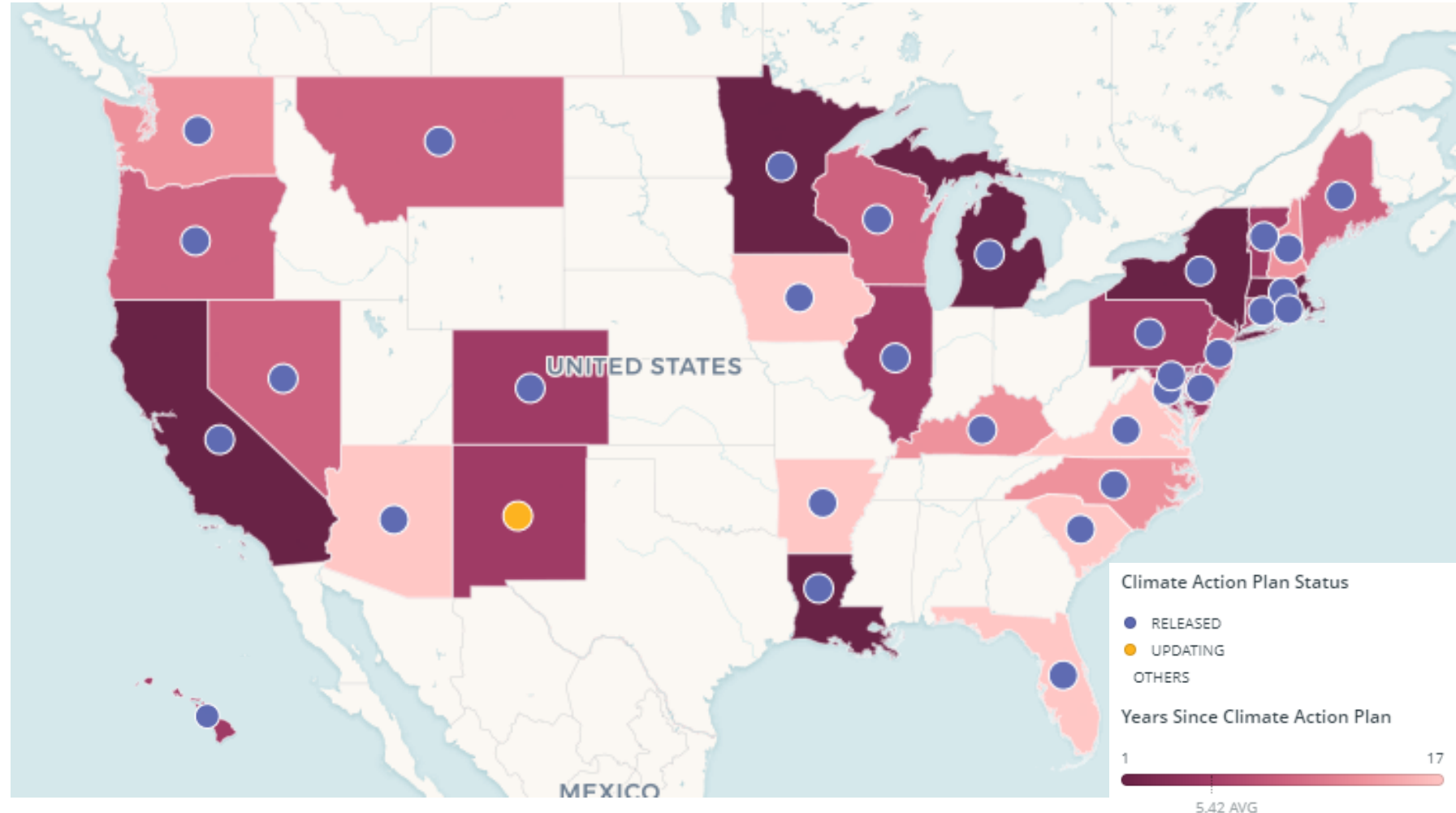
Supply-side policies target extraction of fossil fuels.

Demand-side policies focus on reducing the consumption of fossil fuels.



Climate Action Plans

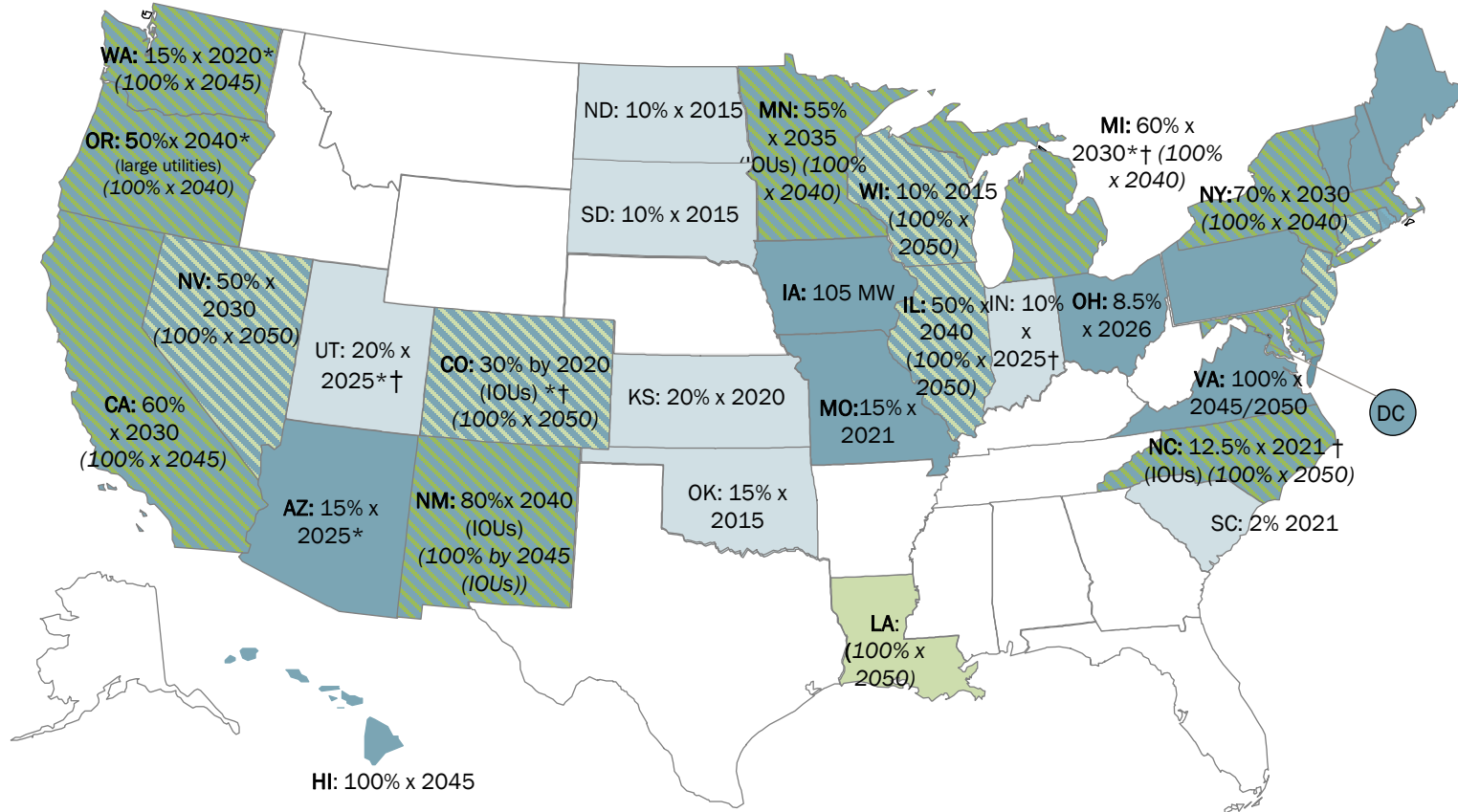
State Climate Action Plans and Buildings
State level emissions reduction plans intersect with buildings and require state funded projects to achieve high performance standards.



Landscape of legislation – supply-side

28 States + DC have a Renewable Portfolio Standard. 11 states have a Clean Energy Standard.

(7 states have renewable portfolio goals, 7 states have clean energy goals)



www.dsireusa.org / December 2023



- ME:** 100% x 2050
- NH:** 25.2% x 2025
- VT:** 75% x 2032
- MA:** 40% x 2030 + 1% each year thereafter (new resources) 3.56% x 2021 (existing resources) (100% x 2050)
- RI:** 100% x 2033
- CT:** 40% x 2030; (100% x 2040)
- NJ:** 50% x 2030; (100% x 2035)
- PA:** 18% x 2021†
- DE:** 40% x 2035; (100% x 2050)*
- MD:** 50% x 2030; (100% x 2045)
- DC:** 100% x 2032

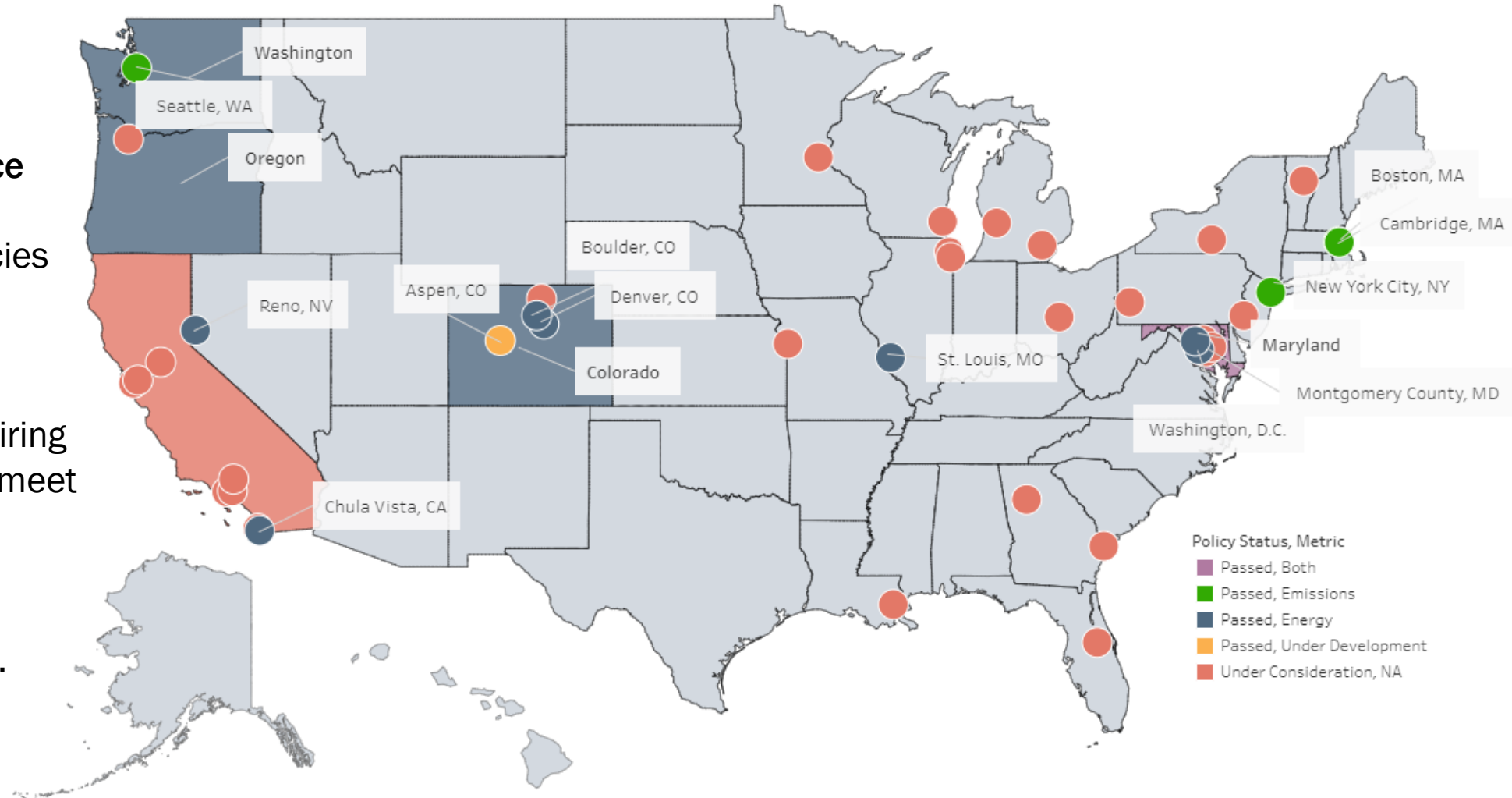
U.S. Territories

- NMI:** 20% x 2016
- PR:** 100% x 2050
- Guam:** 100% x 2045
- USVI:** 60% x 2025



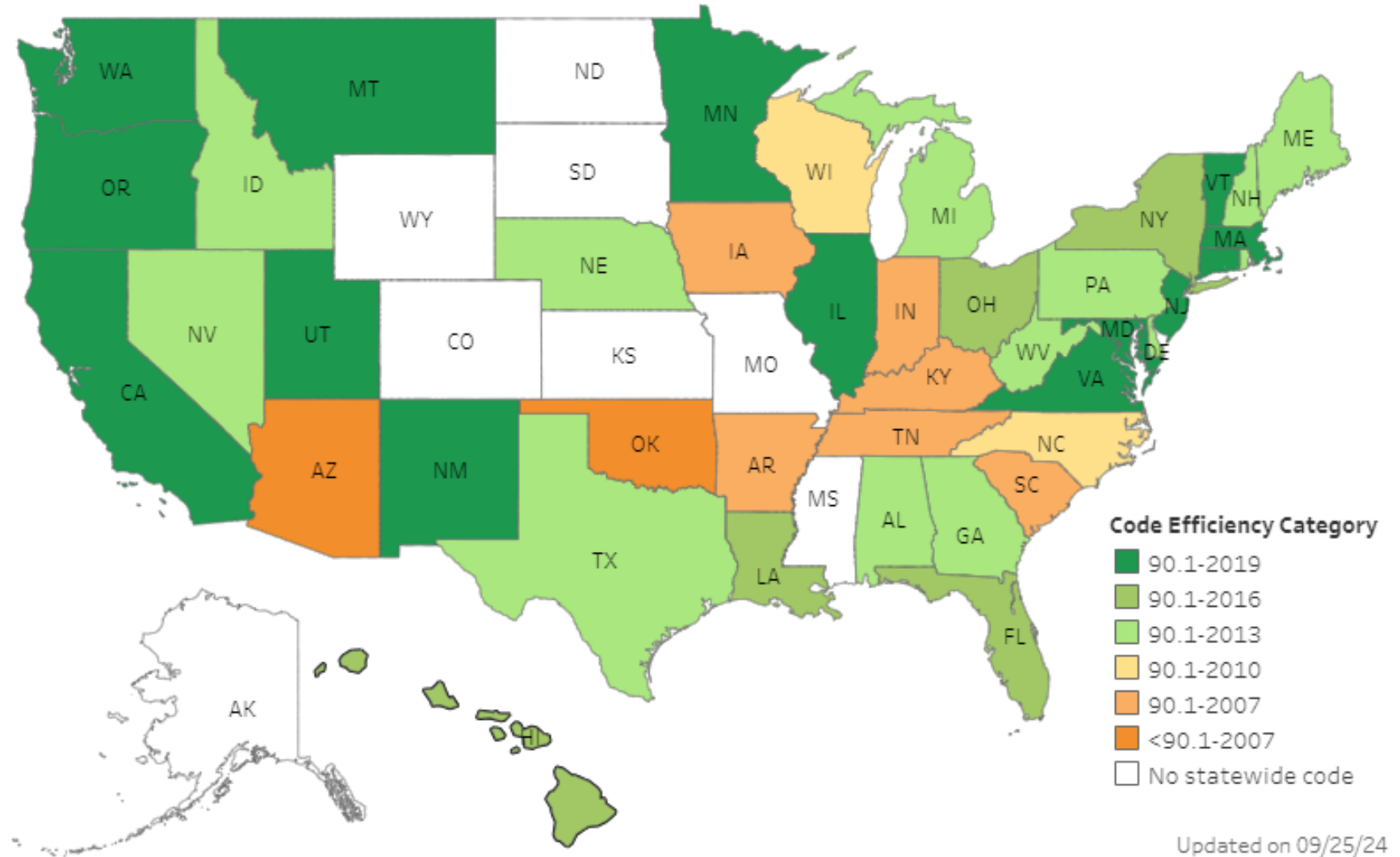
Landscape of legislation – demand-side

Building Performance Standards (BPS) are outcome-based policies and laws aimed at reducing the carbon impact of the built environment by requiring existing buildings to meet energy and/or greenhouse gas emissions-based performance targets.



Landscape of legislation – demand-side

State Energy Codes
State energy code adoption is assessed based on a quantitative analysis of energy savings impacts within a given state.



Landscape of legislation

Navigating the landscape

States and regional entities use mainly three levers to achieve climate goals related to building's energy consumption.

01

Supply-side clean energy standards

Requiring clean energy generation on a timeline.

Also beginning to focus on methane emissions.

02

Demand-side existing building standards

Targets for buildings of certain size that is increasing in performance requirements.

Penalties and incentives for achieving the target.

03

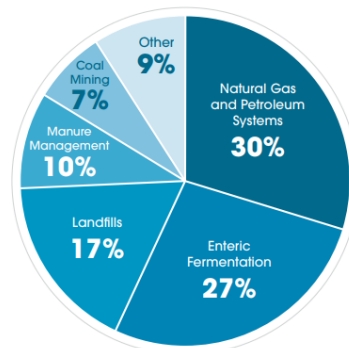
Demand-side new building or renovation standards

Energy efficiency standards for new construction and renovation.

LEED and other green building policies focused on energy and carbon.

Specific focus on public buildings as way to demonstrate leadership and influence the industry.

2019 U.S. Methane Emissions, By Source

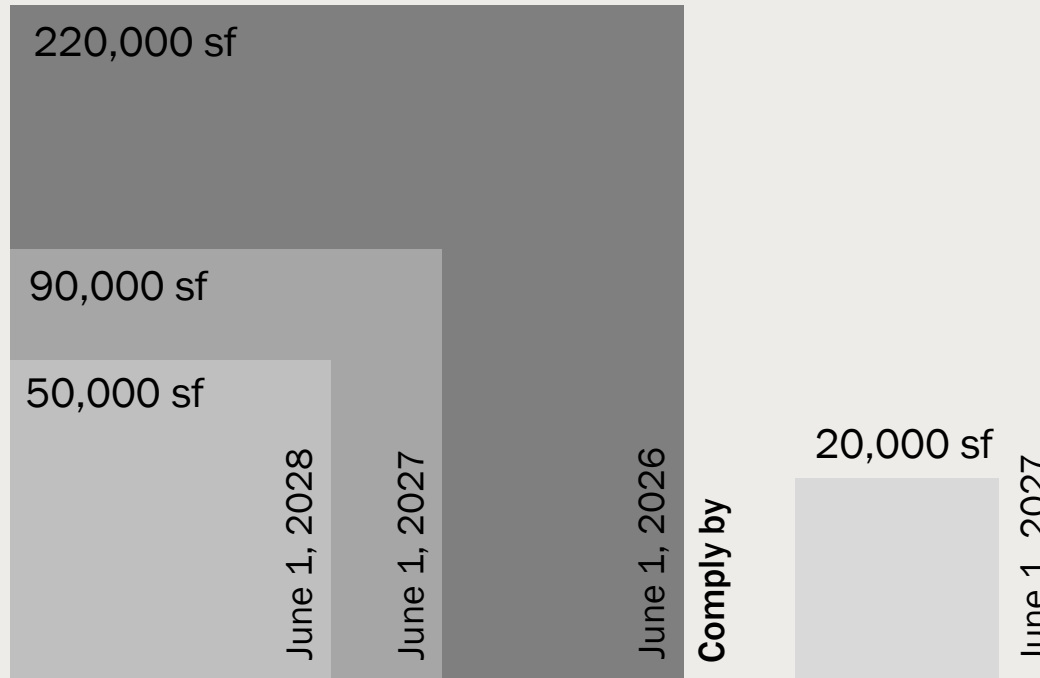


Demand-side performance standard Washington State HB 1257

Clean Building Performance Standards

The objective is to lower costs and pollution from fossil fuel consumption in the state's existing covered buildings, multifamily buildings, and campus district energy systems.

Buildings greater than

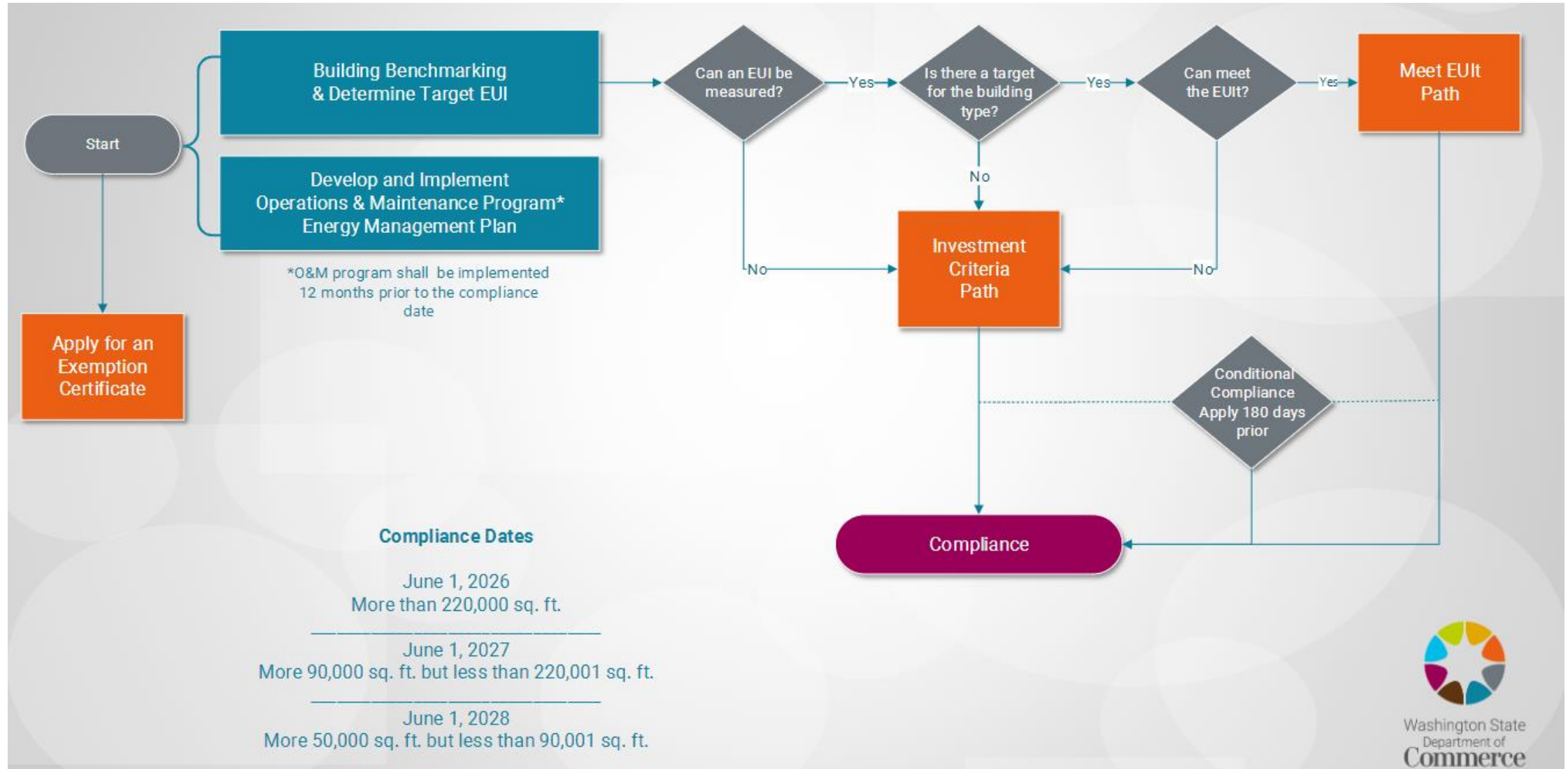


Objective

Tier 1 covered buildings

Tier 2 covered buildings

Demand-side performance standard Washington State HB 1257



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Case Studies



Our approach



Engage

Engage holistically through an iterative process.

Target a compelling vision.



Enrich

Use a data driven approach.

Leverage diverse expertise in high performance buildings.



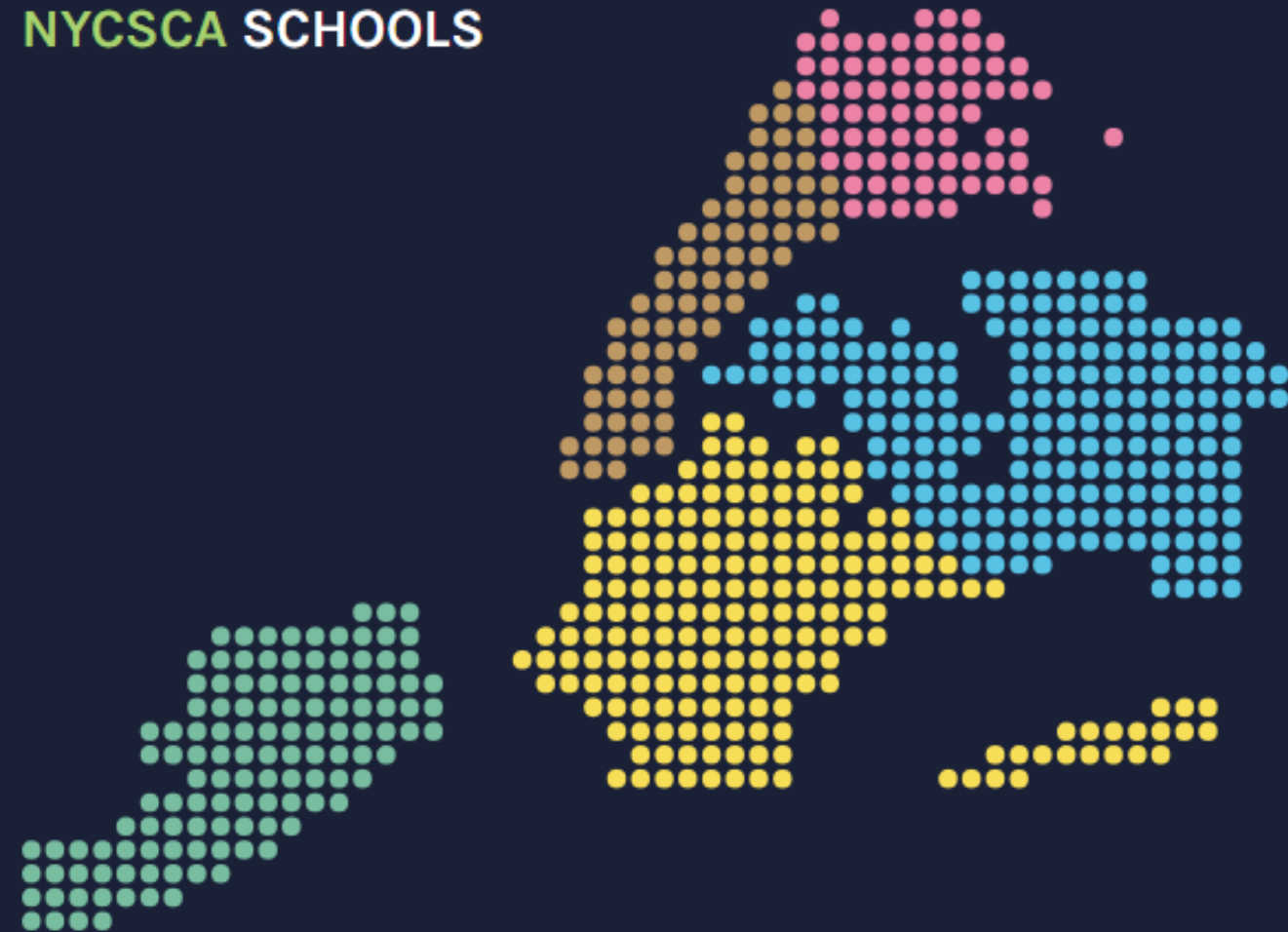
Evolve

Adapt to changing trends.

Collaborate to achieve vision.

NYC School Construction Authority

NYCSCA SCHOOLS



No. of Schools

1600+ BUILDINGS



School Enrollment

84+ THOUSAND



2019 CO2 Emission (Tonnes)

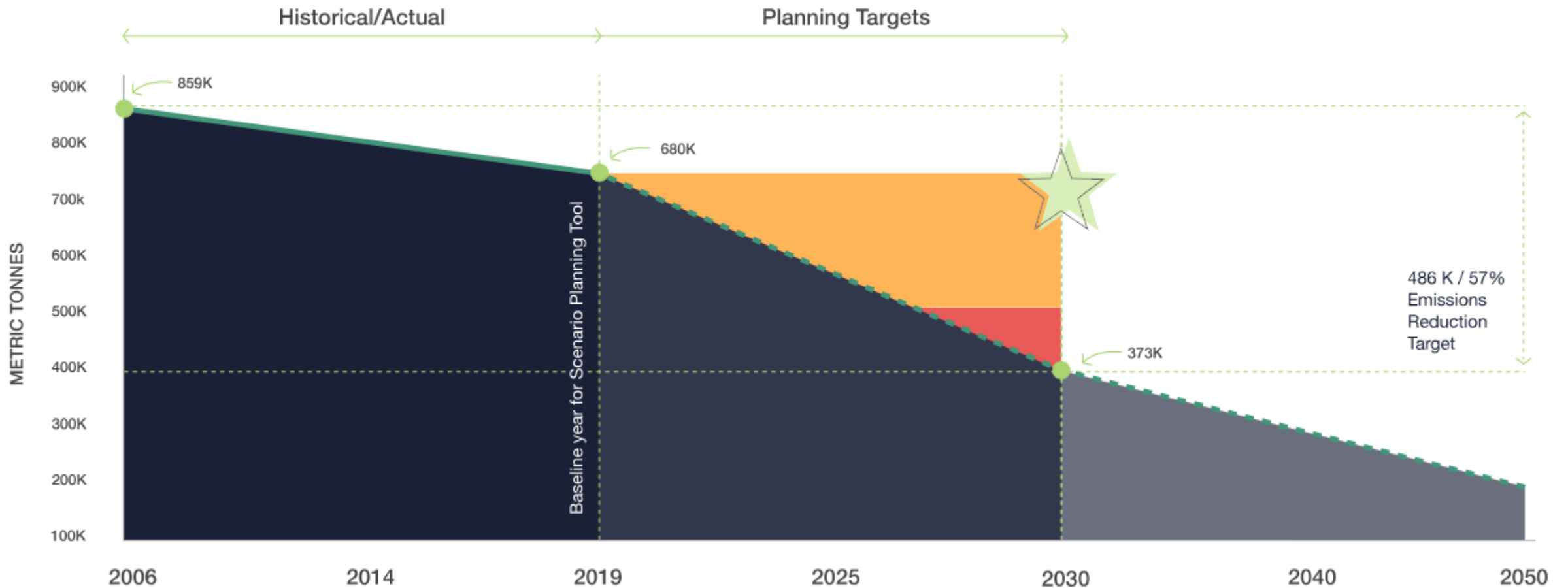
680 THOUSAND



Square Footage

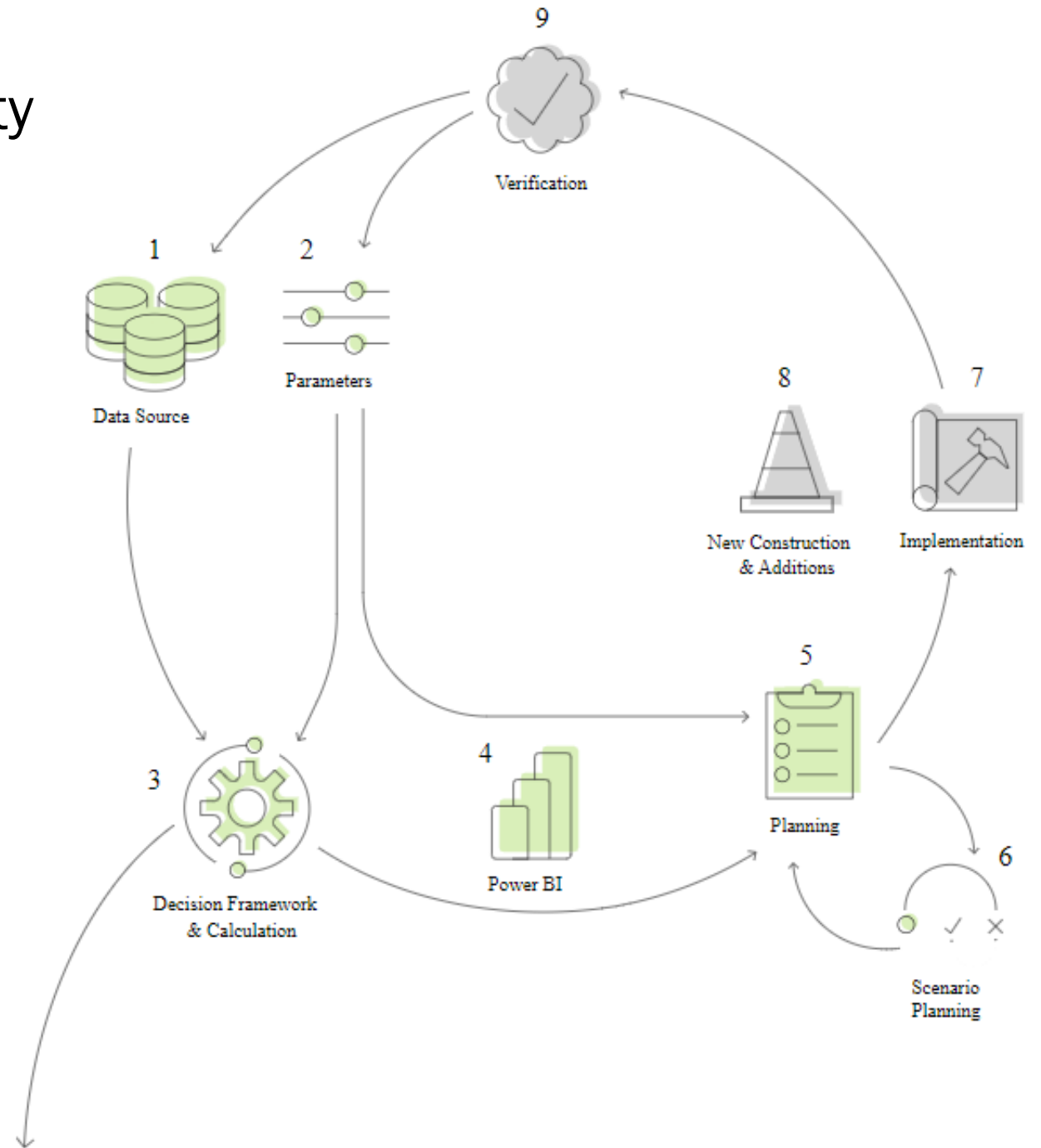
123 MILLION

NYC School Construction Authority Goals and Expectations



NYC School Construction Authority Approach

1. Data Collection
2. Prioritize through engagement
3. Decision tree
4. Validation through site walks
5. Cost estimation & scope of work
6. Scenario planning for flexibility
7. Implementation
8. New Construction & Addition
9. Verification



NYC School Construction Authority Sustainability Planning Application



Tool Filters

Borough: All

Property Type: All

Building Type: Building

BLDG ID: All

Ownership: DOE Owned

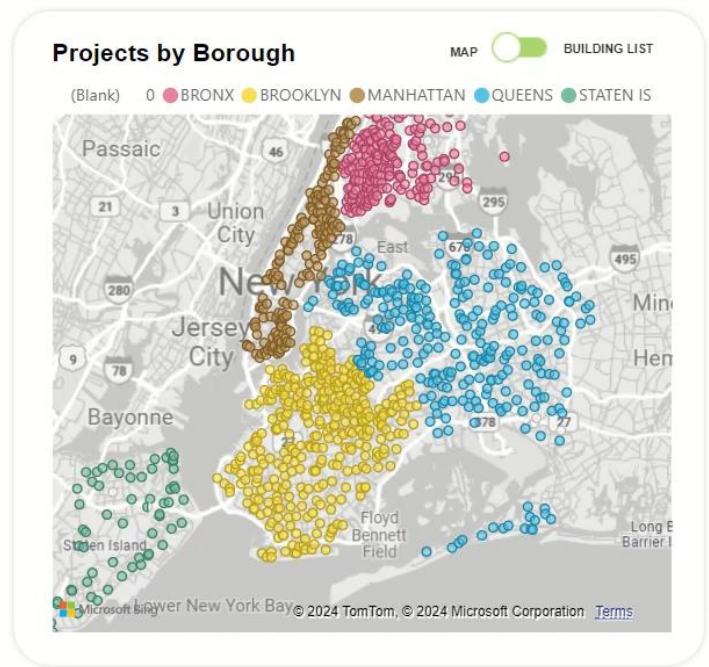
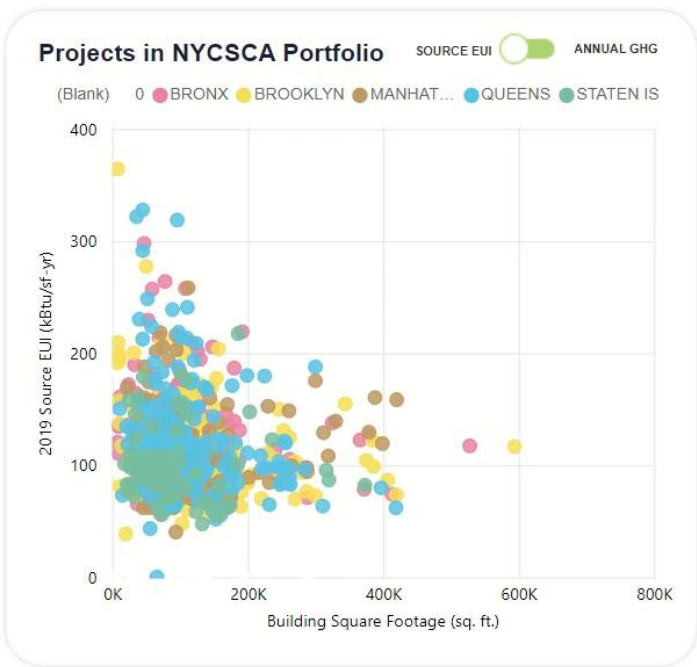
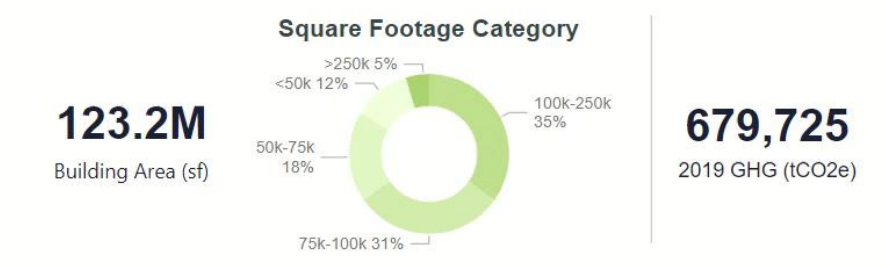
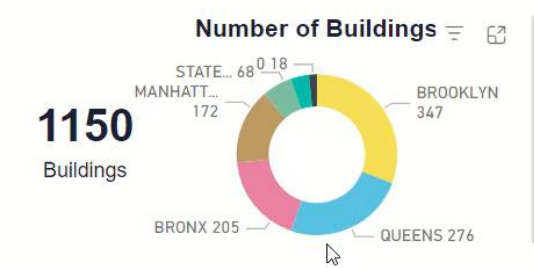
Page Filters

Building Square Footage (sq. ft.): 0 - 750,000

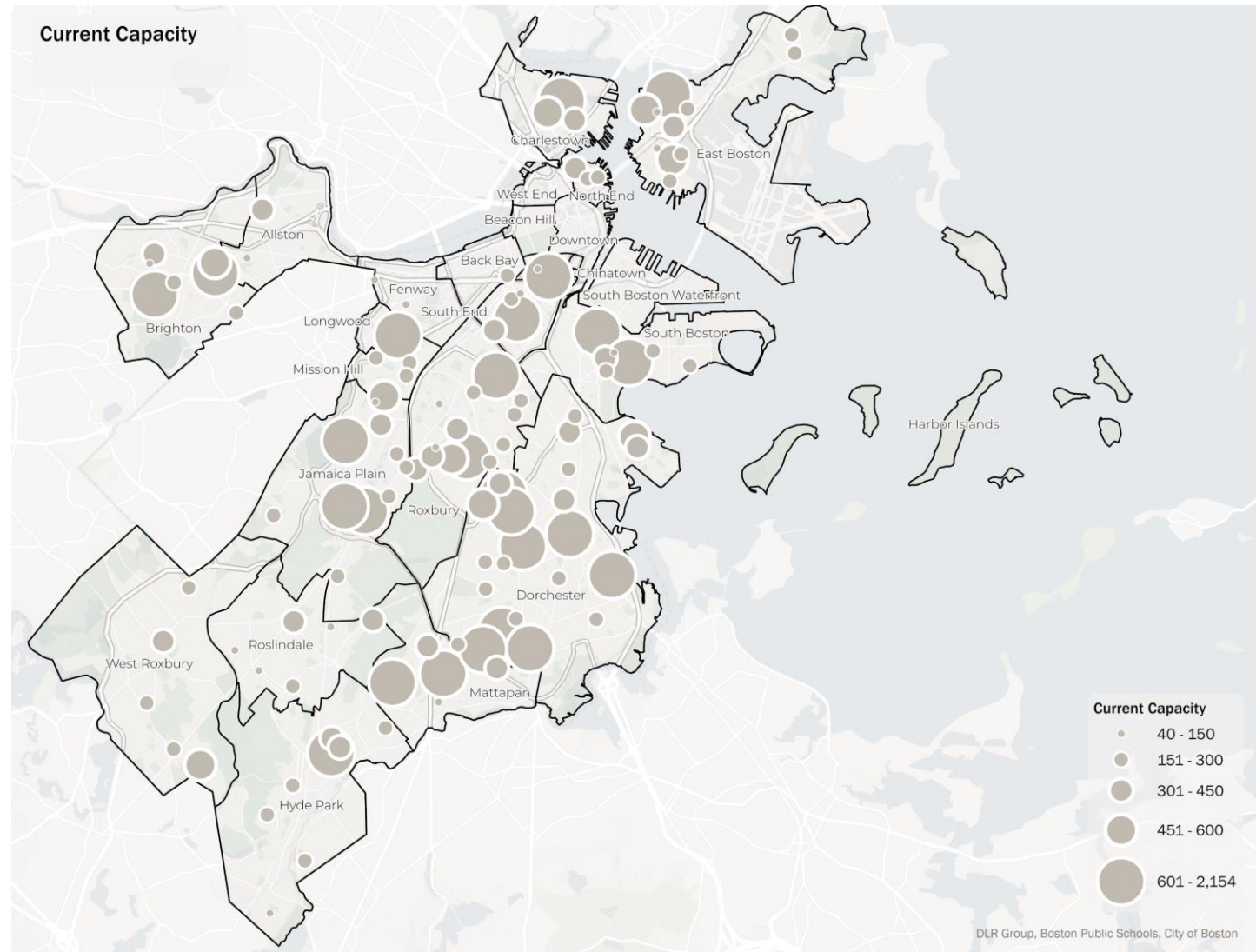
Original Date of Construction: 0 - 2021

Source EUI (kBtu/sf-yr): 0.00 - 393.00

Powered by **DLRGROUP**



Boston Public Schools



655,000+
Residents

46,000+/-
Students

124
Schools

23
Neighborhoods

Boston Public Schools

Prioritize engagement and investment in the schools where needs are greatest/ communities that are historically underserved.



Students & Families



we have to
focus on
these



Neighborhoods

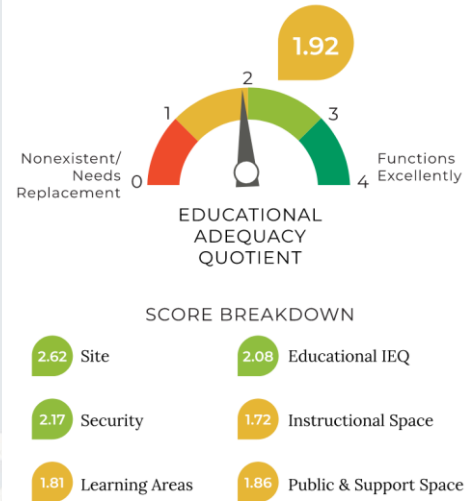
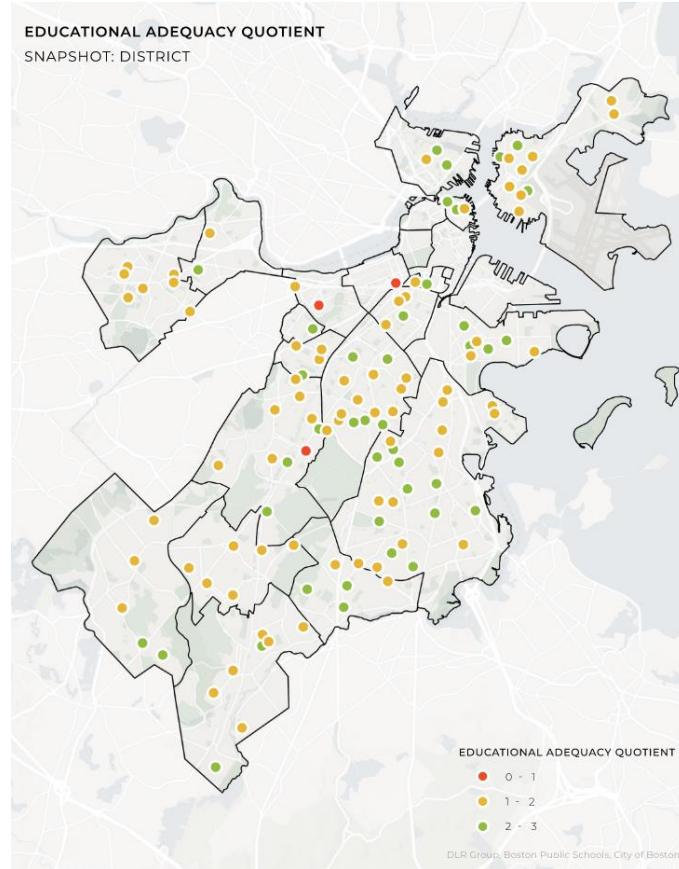


Facilities

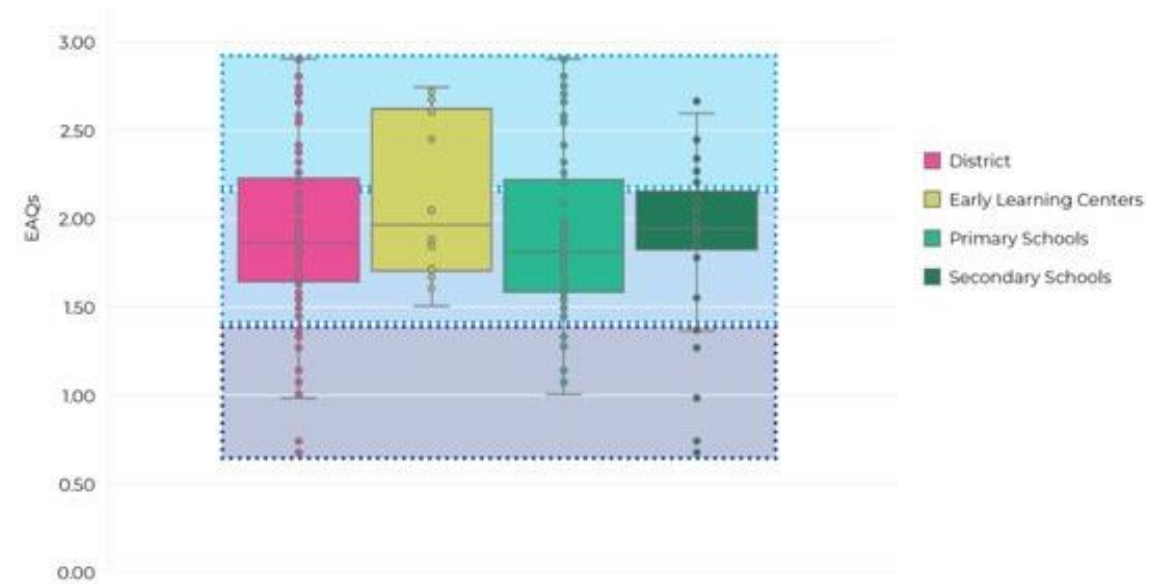


to understand the
impacts of this

Boston Public Schools High Quality Student Experience



Walkthroughs recorded space uses and their current state/quality
EAQ assessments use criteria from DLR Group BOLD/FINNS research



Top Third
2.16 to 2.90

33 schools (2.54 average total score)

5 Early Learning Centers (2.64 avg)
20 Primary Schools (2.57 avg)
8 Secondary Schools (2.41 avg)

Middle Third
1.42 to 2.16

70 schools (1.80 average total score)

7 Early Learning Centers (1.75 avg)
45 Primary Schools (1.75 avg)
18 Secondary Schools (1.95 avg)

Lower Third
0.68 to 1.42

16 schools (1.17 average total score)

0 Early Learning Centers
10 Primary Schools (1.22 avg)
6 Secondary Schools (1.07 avg)

Boston Public Schools Evaluation Rubric



Evaluation rubric criteria

Are Buildings providing a
HQSE: Existing Conditions

Can Reno or New Buildings
provide a HQSE: Capacity & Site

Are HQSE seats close to
students: Proximity

Who benefits from HQSE
seats: Demographics

Beethoven Elementary School

Region 5



Current Facility Information

School Square Footage:	37.45K
Site Acreage:	2.36
Grade Configuration:	PK-6
Number of Seats (Capacity):	237

Building/Site Potential

Model Program Based On:	
Existing Building:	None
Existing Building Alternative:	None
Fits on the Site:	None
Planned Project:	None

Students Served: Current

Note: Based on SY21-22

Student Group	Current Enrollment
Asian	<10
Black/African American	67
Native American or Native Hawaiian/Pacific Islander	0
Latina/o/x	84
Multiracial or Other	21
White	92
Multilingual Learners	93
Students with an IEP	43
Students of Low Socio-Economic Status	157

Neighborhood Opportunity

CDC Social Vulnerability Index Category:	High Vulnerability
Climate Ready Boston Social Vulnerability Index Category:	Lowest Vulnerability

Elements of the High-Quality Student Experience

As a collective community we have identified that all students in BPS must have access to a High-Quality Student Experience. The four categories of the High-Quality Student Experience are grounded in the priorities raised during community engagement sessions. The boxes below show whether the physical spaces needed to support the High-Quality Student Experience are present in the building. Each diamond represents a collection of spaces. A darkened diamond indicates the spaces are present.

3 out of 3

elements of
Rigorous & Culturally Affirming Learning Experiences
exist in the building:

- Public Spaces
- Learning Spaces
- Inclusion

2 out of 3

elements of
Wellness & Enrichment
exist in the building:

- Outdoor Spaces for Learning
- Mental Health and Social-emotional Support
- Student Spaces

2 out of 2

elements of
Supportive Network of Caring Adults
exist in the building:

- Teacher & Staff Spaces
- Family & Community Spaces

0 out of 1

elements of
Overall Facilities
exist in the building:

- Maintenance of Facilities

3 out of 4

Overall Student Experience

- Rigorous & Culturally Affirming Learning Experiences
- Wellness & Enrichment
- Supportive Network of Caring Adults
- Overall Facilities

Seattle Public Schools – John Rogers ES



Seattle Public Schools – John Rogers ES

SPS's first Net-Zero energy building

Geothermal wells for heating and cooling

Daylighting in all classroom and learning spaces

Shading devices on windows to control glare and solar heat gain

Solar panels on nearly all available roof space



John Rogers



Connection to the Natural World



Collective Impact



Health + Well-being



Equitable Ownership of Place



Joy Of Learning

Inflation Reduction Act



Technologies eligible for financial incentive

Ground Source Heat Pump Systems

Solar/Wind Energy

Energy Storage

Electric Vehicles

EV Charging

Thermal Ice Storage Systems

With Prevailing Wage
Without Prevailing Wage or Not Req'd

Technology	With Prevailing Wage	Without Prevailing Wage or Not Req'd	Additional Requirements
Ground Source Heat Pump Systems	2%	15% Max.	Use of Tax-Exempt Funds
Solar/Wind Energy	2%	10%	Possible Add'l. 10% Environmental Justice (solar/wind)
Energy Storage	2%	10%	Energy Community (see IRA map)
Electric Vehicles	2%	10%	American Made Products
EV Charging	No	Yes	5X Multiplier Prevailing Wage/Apprenticeship 5X
Thermal Ice Storage Systems	6%	30% Base	Base Credit for Qualifying Projects Not required under 1 MW

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Key takeaways



30,000 ft view

Navigating the landscape

States and regional entities use mainly three levers to achieve climate goals related to building's energy consumption.

New buildings or renovation.

01

Strategic energy management plan

Align with state and regional goals and targets to attract funding and partners and leverage.

Collaborate with multiple stakeholders to leverage best practices.

02

Decarbonization and equity

Plan for electrification across the portfolio by working with the utility partners.

Understand relationship between decarbonization and equity.

Embed decarbonization best practices into design standards.

03

Renewables and resilience

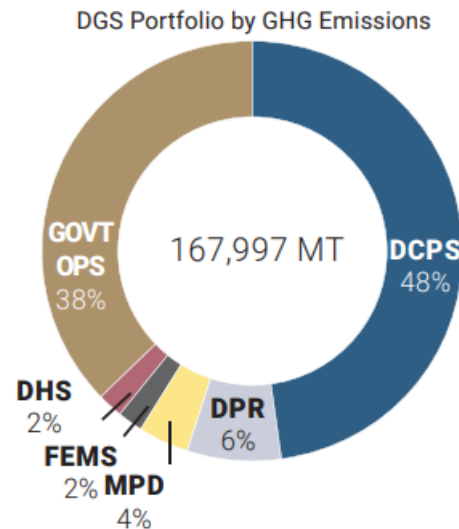
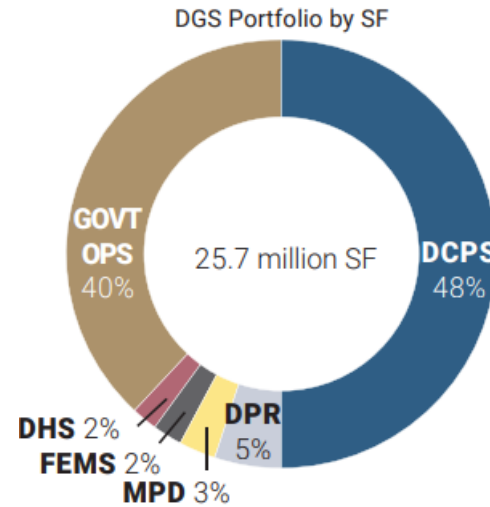
Follow sufficiency, efficiency and then resiliency through renewables.

Engage larger community to enhance community resilience.

Collaborate for easier decision making

DC DGS Strategic Energy Management Plan

- Identify a decision-making framework through inclusive collaboration with all stakeholders.
- Allow the decision-making framework to be adapted to changing trends as you implement the plan.

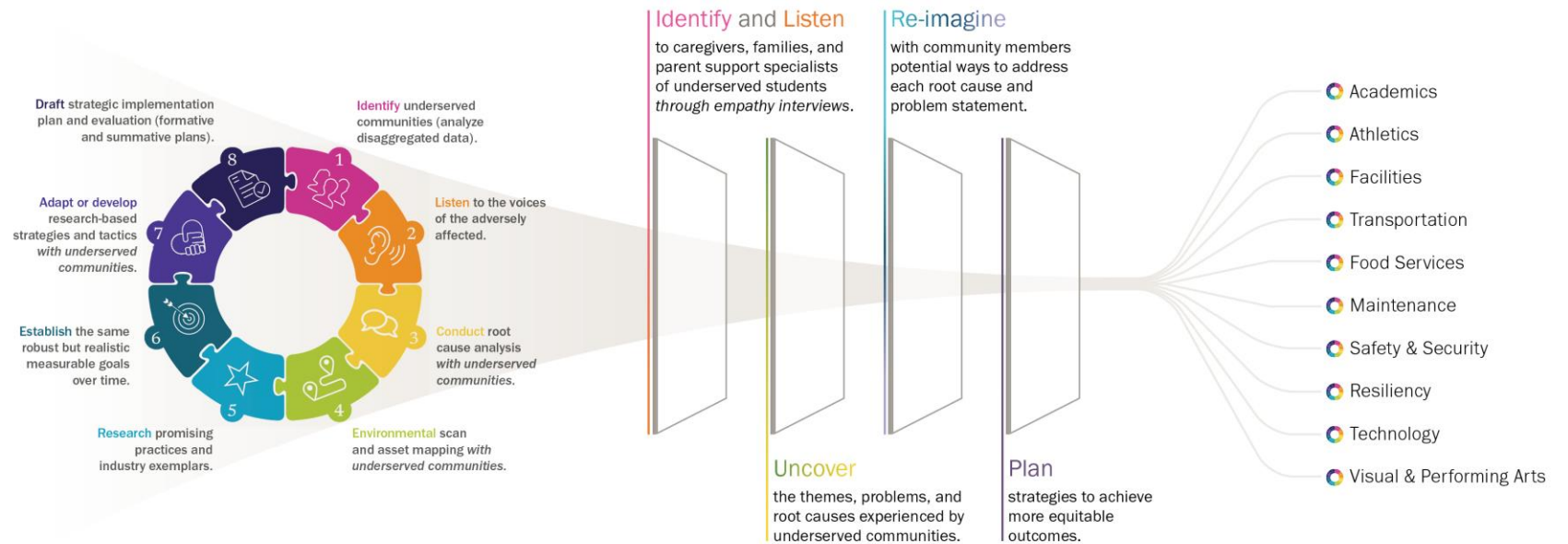


Benchmark for gap analysis

| Applying the Austin ISD Equity by Design Process

Austin ISD Equity Plan

- \$2.4 billion in bond funding approved for school facility improvements.
- 74% community acceptance of the largest bond in AISD history.
- 73% of planned bond projects serve students in underserved communities.



Process

The Austin ISD Long-range Plan implemented the Equity by Design Process, *developed by Dr. Stephanie Hawley*, to center equity-driven decision-making with underserved communities.

Application

The team applied the Equity by Design process with myriad actions, including these four key milestones.

Results

400+ community-driven strategies guide bonds, budgets, policies, and procedures across these areas of the district.

Inform reporting and future project requirements

DC DGS Strategic Energy Management Plan

- Application can be used for future project procurement.
- Report and application can be used to show compliance with state and regional entities.

THROUGH THE LENS OF THE DGS Energy Management Plan

Project Name: Barnard Elementary School

Building Characteristics:

Area (Sq. ft.):	80,000
Last Renovation:	2003
Primary Agency:	DCPS
Fuel Mix (2019):	<input checked="" type="radio"/> Electricity <input type="radio"/> Gas

99.82%

Capital Work Planned: Yes
 Year of Planned Work: 2025
 Scope of Planned Work: Full Scope
 Project Status: (Blank)

Energy Consumption:

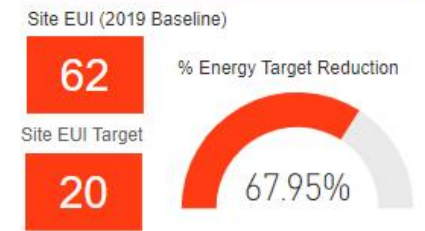
ENERGY STAR SCORE SITE EUI

Year	Energy Star Score
2019	19
2020	19
2021	3
2022	1

MAP **NOTES**

Energy Management Plan Outcome

Scope Category
Whole Building Retrofit



Net Zero Energy Category
NET ZERO CANDIDATE

Modeled Capacity kW: (Lightbox)	90
Installed Capacity (kW):	0
Required Capacity (kW) for Net Zero:	361



BEPS Review

Property Type: K-12 School

BEPS Median ENERGY STAR Score: 36

BEPS Median Source EUI: 139

19 ENERGY STAR Score

175 2019 Source EUI (kBtu/sf)

Meet BEPS?

26% off from the BEPS Source EUI Median

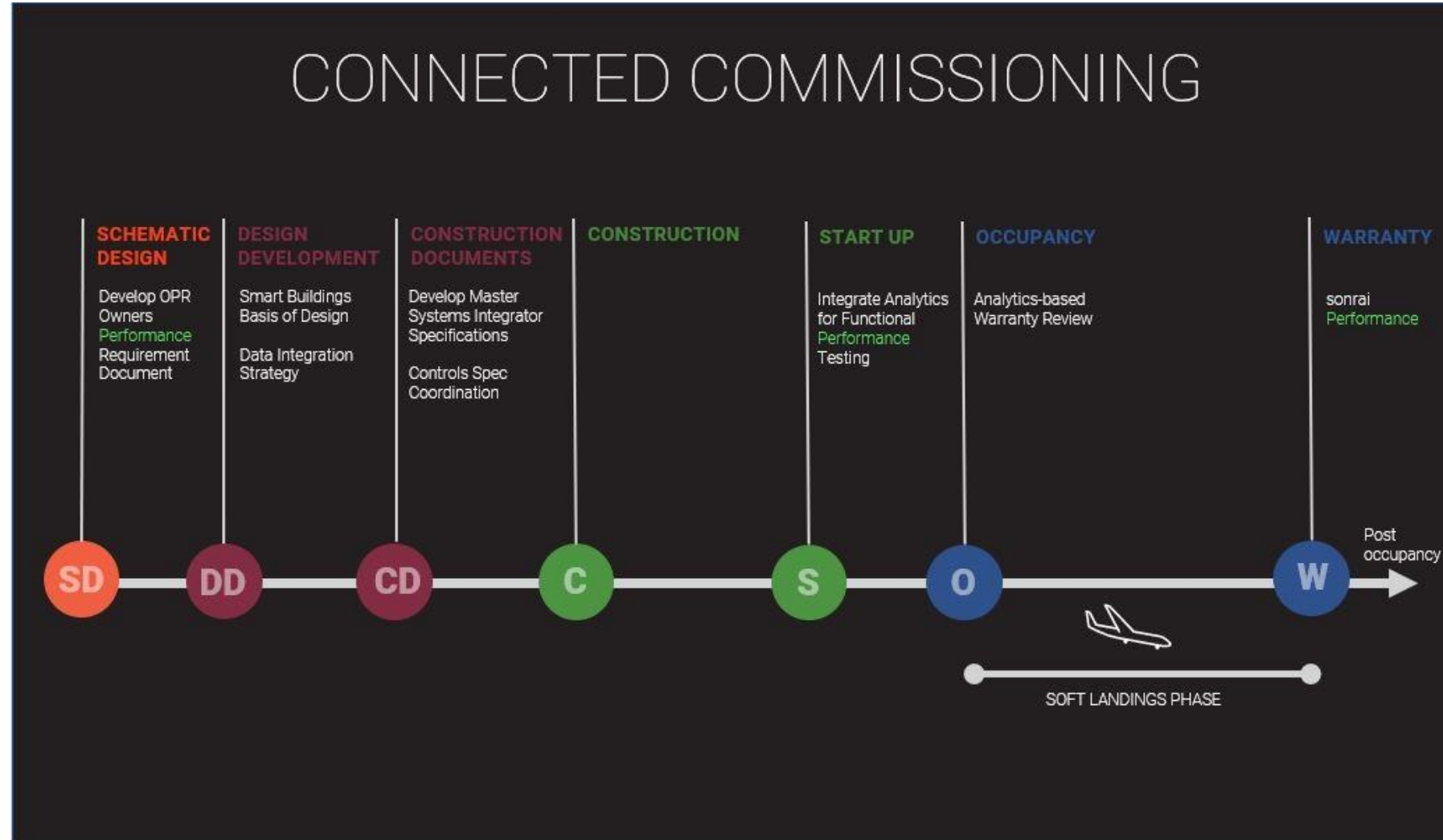
Better **Worse**

NO

Get started with immediate opportunities

Conroe ISD, Texas

- Leverage utility incentives to start assessments and monitoring based commissioning.
- Leverage 179D tax provisions with consultants and contractors.



Prepare for grant funding

USVI Department of Education Grants

- Leverage current projects for various federal and state grants such as the Department of Energy grants.
- Design to net-zero ready and apply for grant to close the gap to zero by showing value to the community.
- WA HB1257 – report early and capture incentive money to support other energy reduction efforts

Arthur Richards PreK-8
13A Mt Pleasant
St. Croix, USVI 00840



Bouschulte PreK-8
9-1 & 12A Bovoni Road Estate Bovoni
St. Thomas, USVI 00802



Central High School
SD 2 Kingshill
St. Croix, USVI 00851



Charlotte Amalie High School
8 and 9 Alton Adams Sr Drive
St. Thomas, USVI 00802



Share impact and gather community support

Sacramento Facilities Master Plan

- Develop a story map online and share the progress of the plan during its development and through its implementation.
- Showcase any data that supports community impact and improvement.



Overview

Campus planning for community impact

Introduction

The Facilities Master Plan recommends capital improvement bond projects that improve the physical environment for teachers, and families for many years. These projects ensure the **creation of safe, comfortable spaces for all** while also providing facilities that support the LCAP's guiding principle to **"improve outcomes for all students and address significant performance gaps between student groups."**

Why it matters

"Sacramento City Unified School District is committed to giving all students an equal opportunity to graduate with the greatest number of postsecondary choices from the widest array of options. SCUSD has evaluated the condition of all of its school sites and identified significant school facility improvement needs, estimated at over \$3.5 billion."

Source: Measure H Bond Language, approved March 2020

Statement of Accountability regarding Equity

The \$750 million school facility improvement bond "would require a clear system of accountability to the public including a project list detailing exactly how the money will be used [through] the development of internal District equity indices to help identify funding priorities based on level of need."

Source: Board of Education Resolution 3113, approved November 2019

Overview

1) Participation

2) Campus Assessments

3) Educational Specs

4) Equity Indicators

5) Priority Methodology

6) Vision Projects

7) Planning for Equity

The community impact planning process is outlined by seven steps:

Plan for resources needed for implementation

Riverside College Community District Sustainability and Climate Action Plan

- Consider the total cost of ownership to account for staff needed to implement the identified projects.
- Integrate other planning projects with energy planning to leverage resources such as data collection.



Sustainability and Climate Action Plan

An implementable roadmap toward holistic sustainability Goals, which establishes RCCD as a leader in addressing Environmental Stewardship and Climate Change.

AASHE Stars Alignment

Association for the Advancement of Sustainability in Higher Education (AASHE) Stars is a third-party reporting framework connecting sustainability in the built environment and academics. Planning intentionally infuses the AASHE Stars framework into the Sustainability and Climate Action as a roadmap towards peer group recognition of each College's sustainability efforts.



Integrated Energy Master Plan (IEMP)

Establish an implementable roadmap toward Carbon Neutrality and Net Zero Energy at each campus. The plan will benchmark against established and future Goals.



Total Cost of Ownership (TCO) Model

Develop a framework for cost-effective decision-making that identifies human and capital resources needed to address the Goals of the S-CAP and IEMP. The TCO is also included with the College's accreditation requirements.

INTEGRATED PLANNING

These deliverables will connect to other plans across the District, such as District Strategic Plan, the College's Strategic Plan, Educational Master Plan, Facilities Master Plan, and more.

- District Strategic Plan*
- College's Strategic Plan*
- College's Educational Master Plan*
- College's Facilities Master Plan*
- Five-year Capital Construction Plan*
- Operational and Maintenance Plan*
- Fiscal Plan*
- Solar Planning Initiative*
- Student Equity Plan*
- Guided Pathway Plan*
- Affordable Housing Planning*

Integrate with curriculum

Close the incredible skill gap

- Climate action requires skilled professionals within many industries that educational institutions can provide.
- Ex.: NY will need 269,000 jobs by 2050 to hit its climate goals in electrification, fuels, buildings and transportation.



Engage the students

Architects and educators

- Identify opportunities to engage students through consultant's professional mentorship events.
- Invite students to stakeholder meetings and progress meetings so there is a vested interest in celebrating and contributing to the results.



This shouldn't be hard! Have fun!



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Questions and discussion

