

Building Seattle Better

Improving Performance in Existing Buildings

Technical Advisory Group – Meeting #1



Technical Advisory Group: Meeting #1

AGENDA

- Introductions
- Overview / Policy Process
- Context
 - Why Performance Standards?
 - Why *Carbon-Based* Performance Standards?
- Buildings Landscape
- Policy Development Framework
- TAG Process



**Office of
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Organizations

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Overview / Policy Development Process

Green New Deal

This bold leap towards a climate pollution-free city aims to create jobs and advance an equitable transition from fossil fuels to renewable energy by prioritizing investments in communities historically most harmed by economic, racial, and environmental injustices.



Green New Deal Executive Order 2020-01

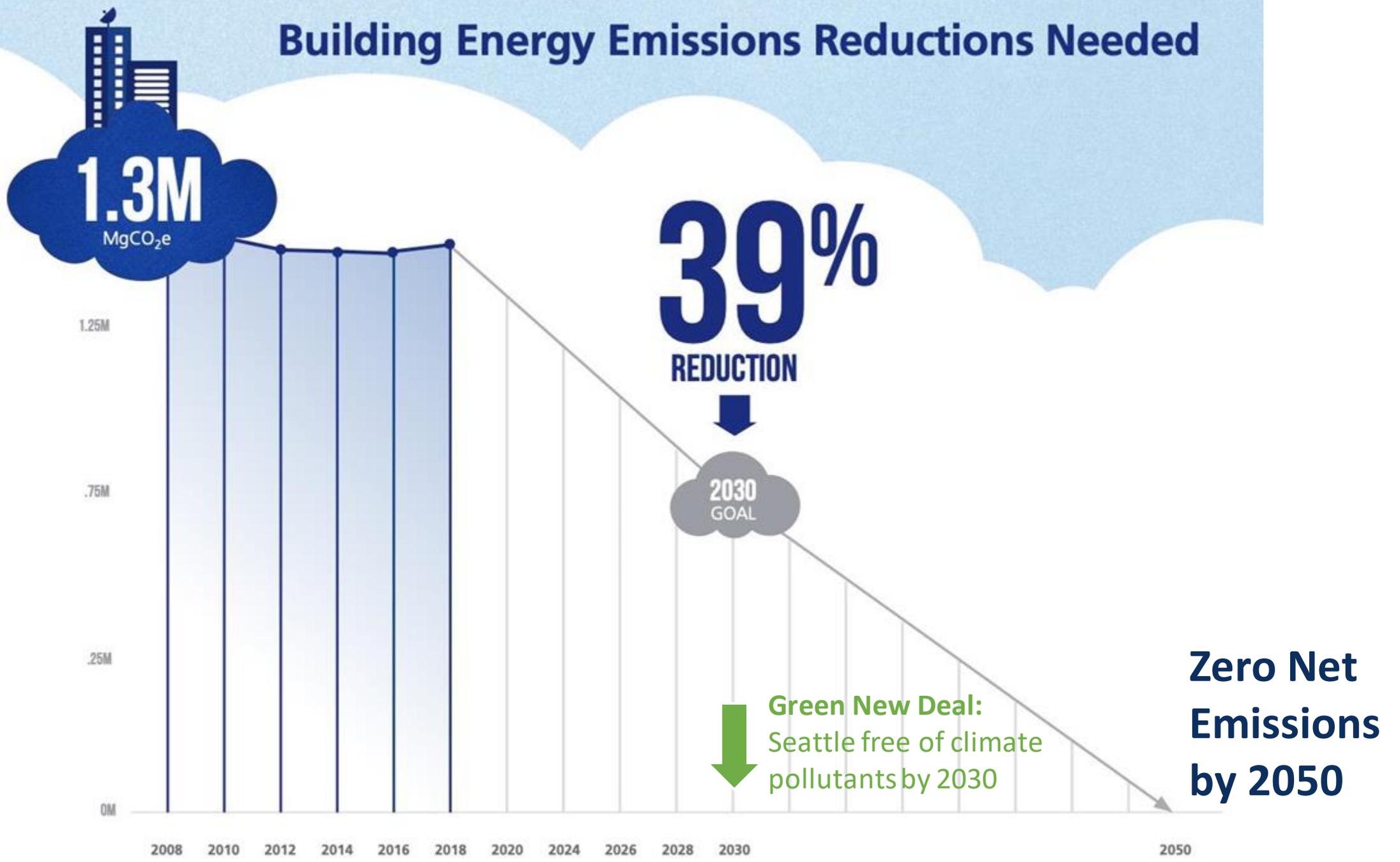
1. **Reduce pollution** at the rate of progress scientists say is necessary to limit average global temperature increase to 1.5 degree C
2. Promote economic opportunity and **inclusive access to stable well-paying jobs**
3. **Advance environmental justice** by ensuring the benefits and investments of the clean energy transition accrue to those communities and populations historically most burdened by the fossil fuel economy

Green New Deal Oversight Board

The City of Seattle Green New Deal Oversight Board is composed of 19 appointed members who are passionate about advancing an equitable transition to renewable energy by centering the expertise of Black, Indigenous, People of Color, immigrants, refugees, people with low incomes, youth, elders and workers harmed first and worse by climate change.



Building Energy Emissions Reductions Needed



Source: City of Seattle. 2018 Community Greenhouse Gas Emissions Inventory.
https://www.seattle.gov/Documents/Departments/OSE/ClimateDocs/2018_GHG_Inventory_Dec2020.pdf

Driving Accelerated Climate Action - Buildings

- Implement the actions necessary . . . to reduce building-related emissions by at least 39% from the 2008 baseline by 2030 and to reach net-zero carbon by 2050.
- Develop **carbon-based building performance standards** for existing commercial and multifamily buildings 20,000 sq.ft. or larger.
- Electrification Strategy . . . for all municipal buildings to operate without fossil fuel systems and appliances no later than 2035.

Mayor Durkan Executive Order 2021-09, October 29, 2021



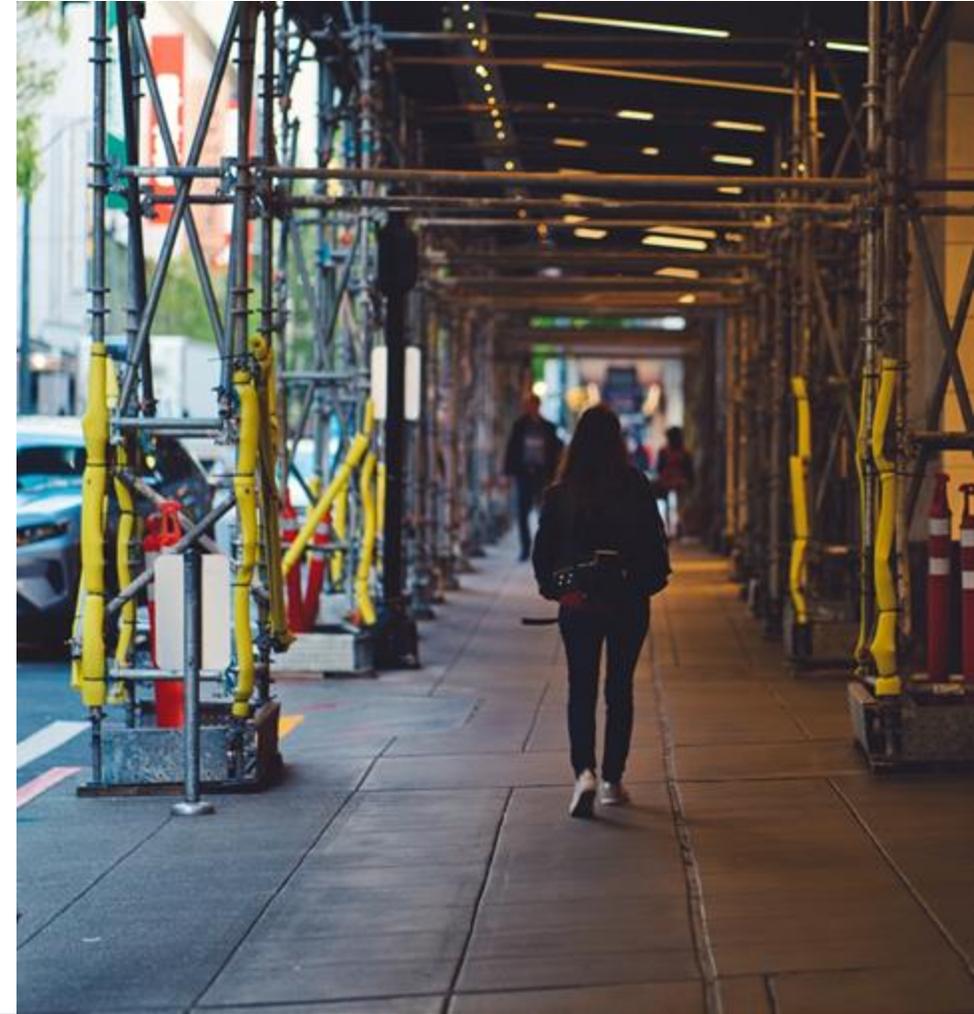
Driving Accelerated Climate Action - Building Targets

OSE shall immediately commence inclusive stakeholder engagement necessary to develop this legislation, with a **draft ordinance due to the Mayor's Office by July 1, 2022.**

The ordinance shall:

- set **carbon-based emission targets**
- that transition to **net-zero emissions no later than 2050**, but as soon as is feasible,
- with **initial emission reduction targets** for the largest cohort of buildings beginning **no later than 2026**

Mayor Durkan Executive Order 2021-09, October 29, 2021



Driving Accelerated Climate Action - Equity

- Include equity-focused support services for low-resource building owners, particularly **alleviating cost impacts** on affordable housing and small businesses;
- Minimize the risk of displacement and **ensure Seattle's Black, Indigenous, and people of color (BIPOC) communities benefit from healthier living and working spaces; and**
- Provide clean energy career initiatives to **maximize the economic benefits and opportunities** of the generated economic activity for BIPOC and women.

Mayor Durkan Executive Order 2021-09, October 29, 2021



“Designing an equitable building performance standards policy is critical work . . . Together, at home and in this coalition, we can advance innovative, urgent, **climate-forward policy that creates jobs and reduces emissions with climate justice at the center.** I know through collaboration and peer learning we will continue our march to ensure green, carbon-free buildings. . .”
Mayor Bruce Harrell

Graphic: IMT

www.nationalbpscoalition.org



Policy Package: Existing Buildings Performance



Technical Advisory Group Role

1. Subject matter expertise.
2. Advisory.
3. Thought partners.
4. Highlight key considerations.
5. Identity best approaches.



*How define a net-zero emissions building?
Compliance intervals?
Compliance variations by building type?
Incorporate energy targets?
How integrate building tune-ups?*

Legislation

Basic requirements, for example:

Building Size & Type

Compliance deadlines

Penalties

Directives on additional action

Rulemaking

Clarifications, for example:

Compliance processes

Alternative compliance pathways

Specialist criteria

Complementary Programs & Policies

For example:

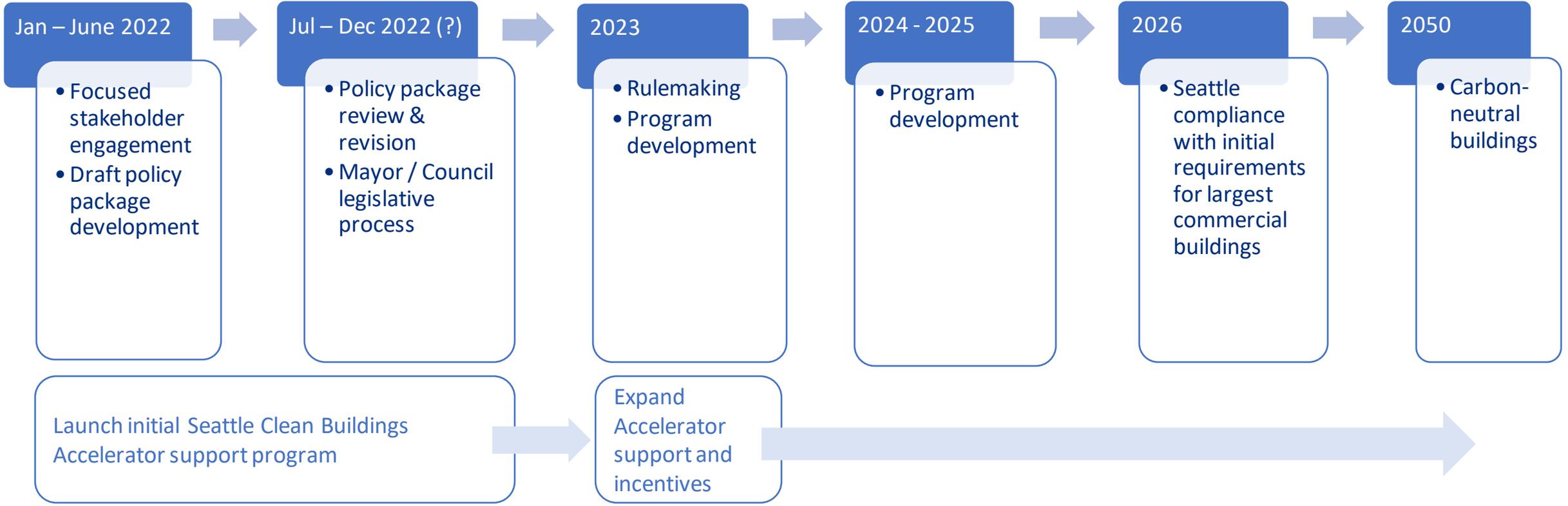
Technical support and coaching

Workforce development programs

WA State Clean Buildings Standards Early Adopter Incentives available to commercial and multifamily buildings over 50,000 sq.ft.

2026 -2028
WA Clean Buildings
Standards first
compliance cycle

July 1, 2022
Draft Policy to
Mayor's Office





Context: Why Performance Standards?

Stewart Manor Affordable Housing

An energy efficiency and electrification path to carbon neutral



Credit: UW Integrated Design Lab

About

Address: 6339 34th Ave. SW, Seattle, WA 98126.

Size: 49,510 sf, six-story, 74 one-bedroom units for people with low incomes.

Original Construction: 1968.

Projected Energy Savings: 13% – 35%.

Projected Total Emissions Reductions: 27.5 MT CO₂e annually.

Projected Utility Cost Savings: \$18,500 annually.

Estimated Total Plan Costs: \$8.15/sf.

Owner: Seattle Housing Authority.

Consultants: University of Washington Integrated Design Lab and Solarc Energy Group, with special thanks to Seattle Office of Housing for their technical feedback.

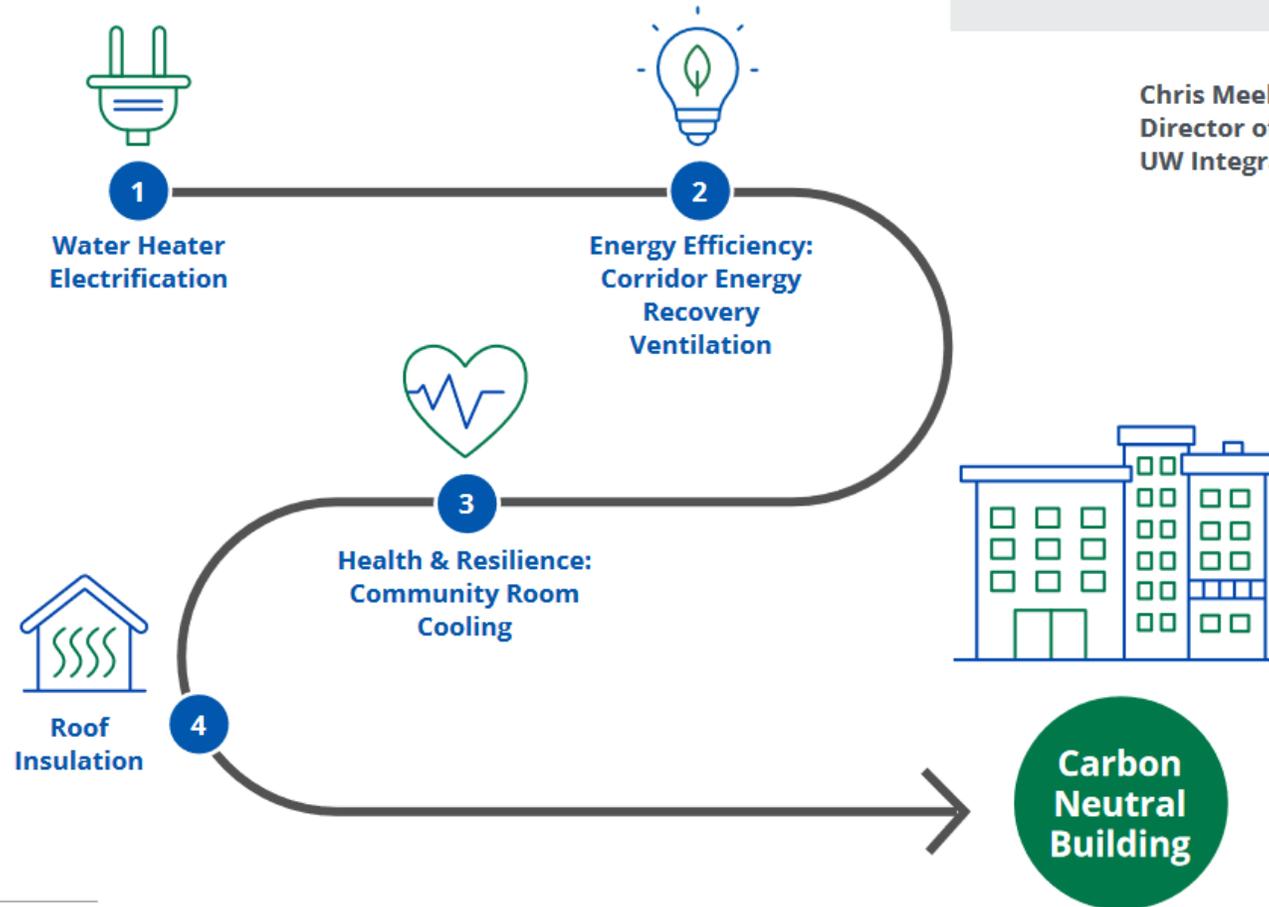
www.seattle.gov/building-performance-standards

Steps to a carbon neutral building:

Through an energy audit and modeling, the UW Integrated Design Lab and Solarc Energy Group identified a four-step path for the Stewart Manor apartments to **reduce energy use by 35 percent and emissions by 79 percent** to achieve an all-electric carbon neutral building, while adding on-site cooling in the community room.² For this building, total cost for the plan is estimated at \$8.15 per square foot. Estimated utility cost savings are \$18,500 annually using 2021 rates.³

Learning from the Seattle Housing Authority and Seattle Office of Housing experiences was a highlight of this project. Collaborations like these are critical to meeting the intersecting crises of affordability, human health, and climate change.

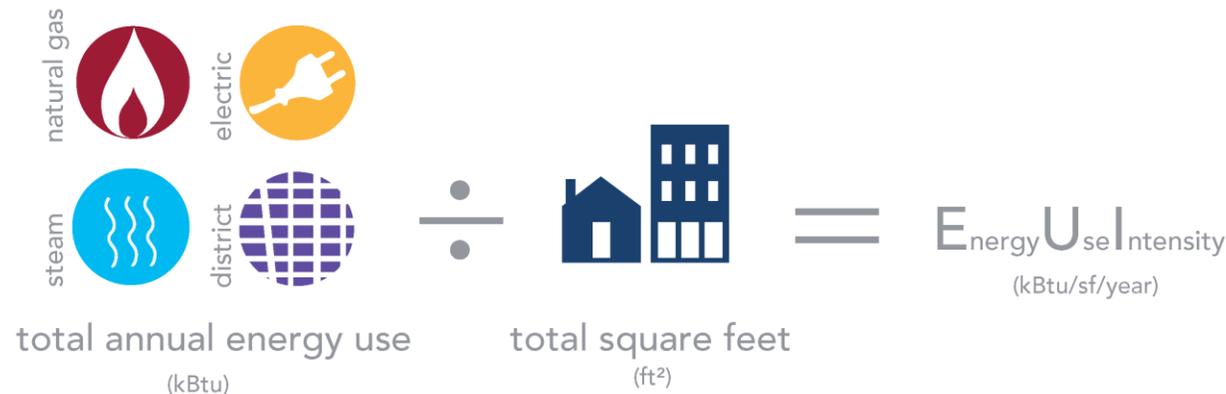
Chris Meek,
Director of
UW Integrated Design Lab



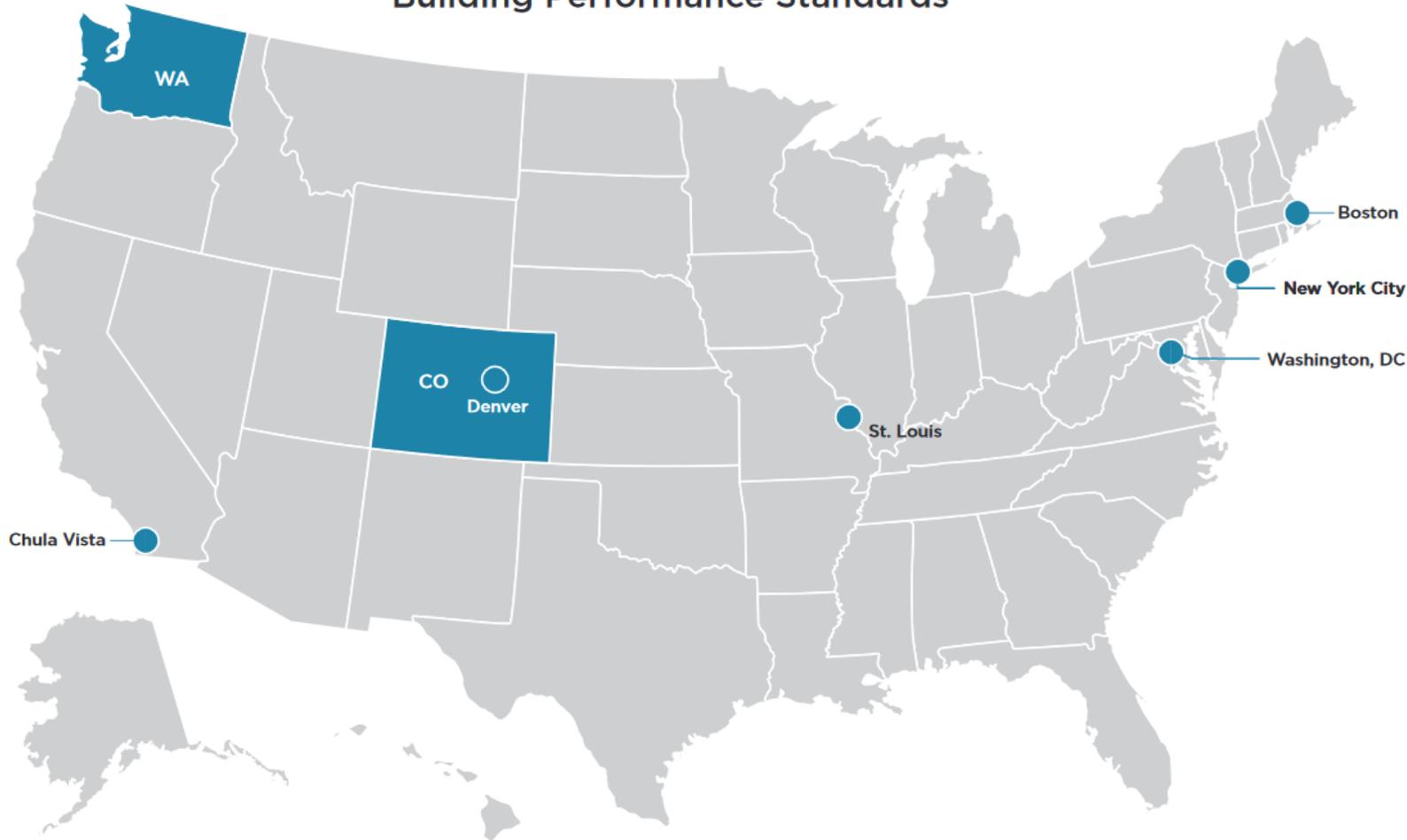
What are Building Performance Standards

Purpose: provide defined performance targets for individual buildings to ensure that, in aggregate, the necessary energy and/or GHG emissions reductions are achieved.

- Buildings achieve a final defined target
- Final target reached over a long-term timeframe.
- Intermediate targets to achieve near-term improvements
- Complements energy code by addressing existing buildings not otherwise seeking permits
- Allows owner flexibility in how targets are met



U.S. City and State Policies for Existing Buildings: Building Performance Standards



Energy Use Intensity (EUI, kBtu/SF/yr)

WA, St. Louis, Denver

ENERGY STAR Score or EUI

DC, St. Louis, Chula Vista

Greenhouse Gas Intensity (kgCO₂e/SF/yr)

NYC, Boston



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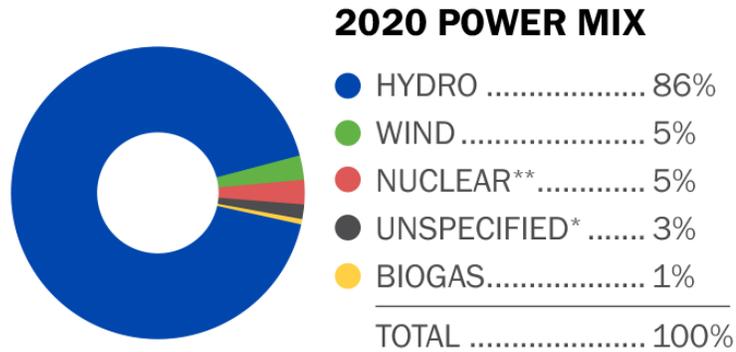
www.imt.org/public-policy/building-performance-standards/





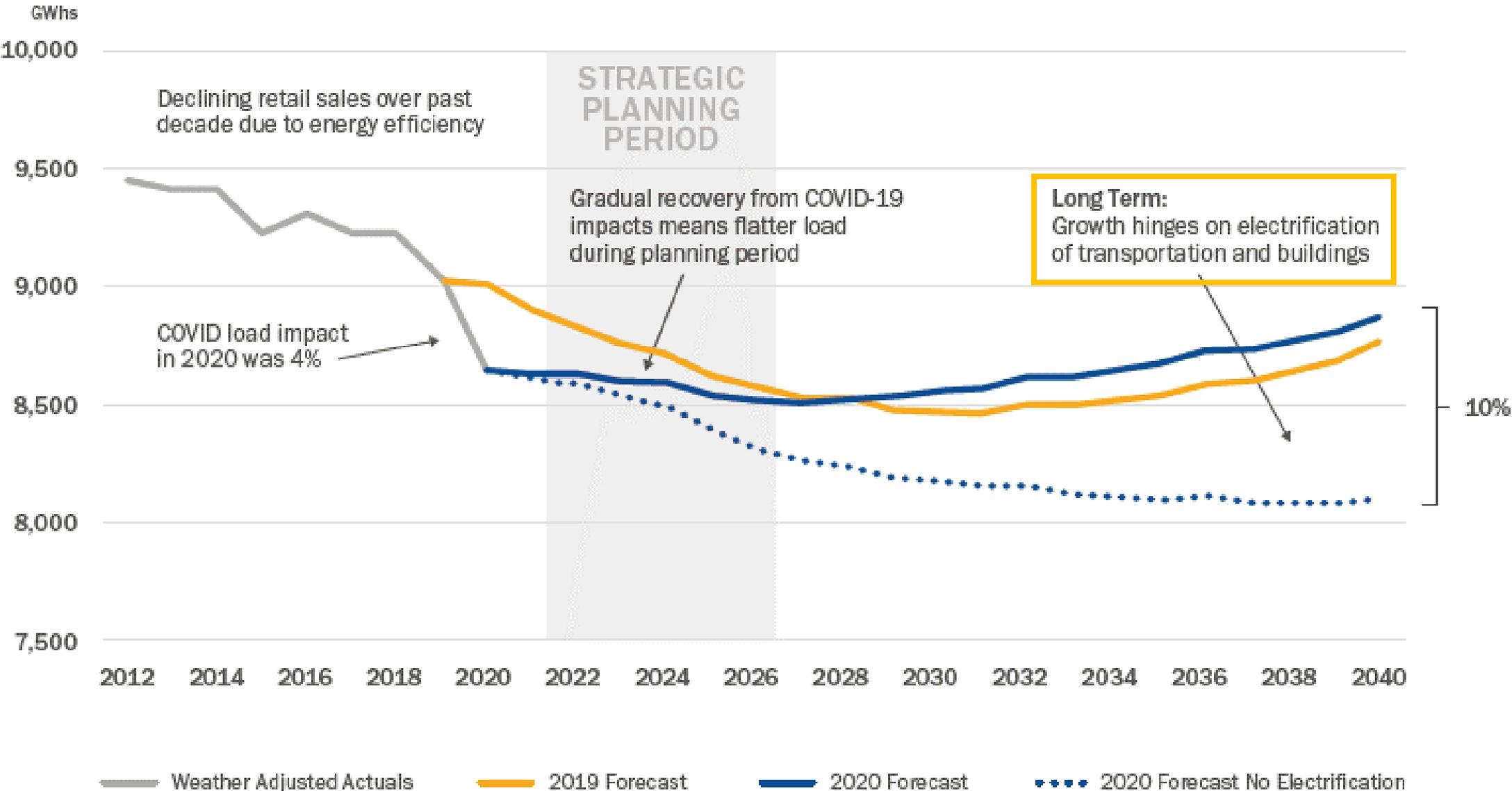
**Context:
Why *Carbon-Based*
Performance Standards?**

Carbon neutral electricity



- In 2005, City Light became the first electric utility in the country to achieve zero net greenhouse gas emissions
- >90% of City Light’s fuel mix is emissions-free; 100% of emissions are offset
- Our Integrated Resource Plan relies on only new renewables and energy efficiency to meet future load growth

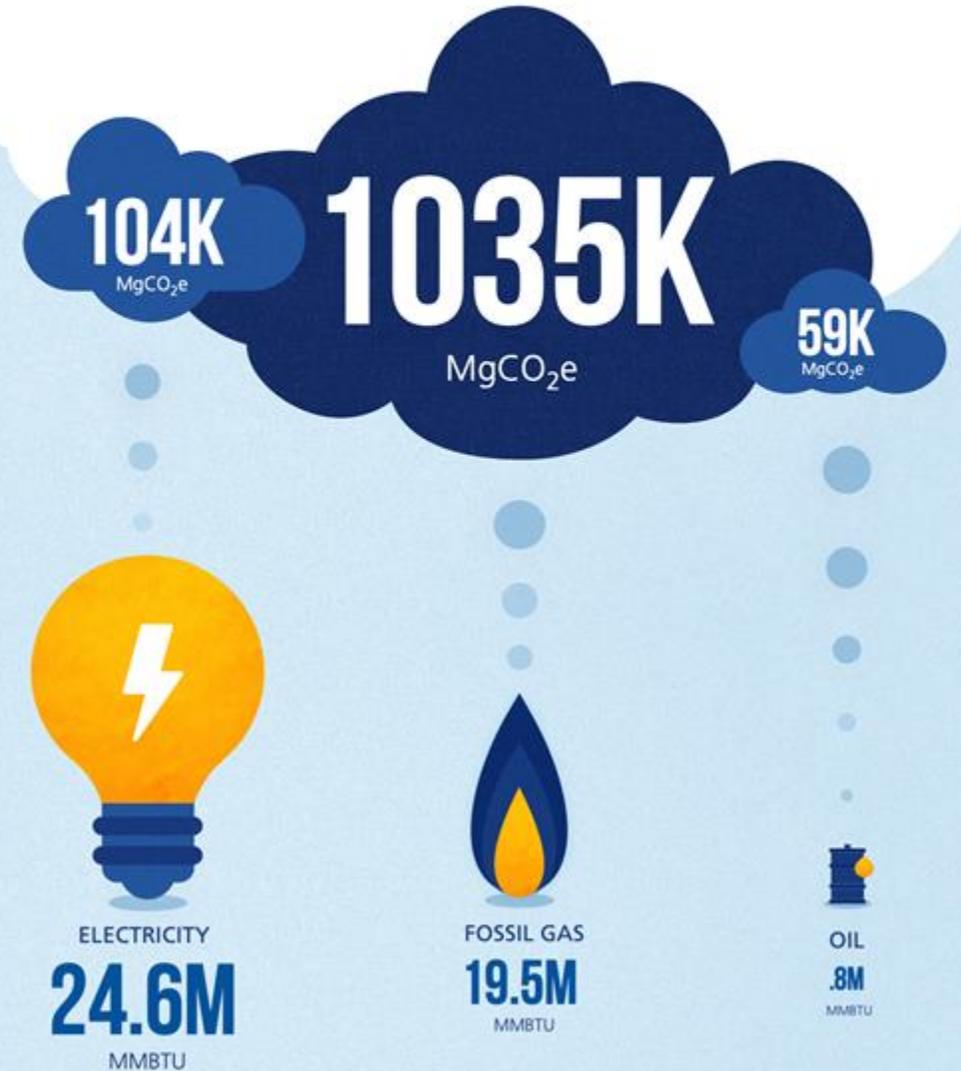
SEATTLE CITY LIGHT RETAIL SALES FORECAST



Electricity produces significantly fewer emissions compared to fossil fuels like fracked gas and oil.

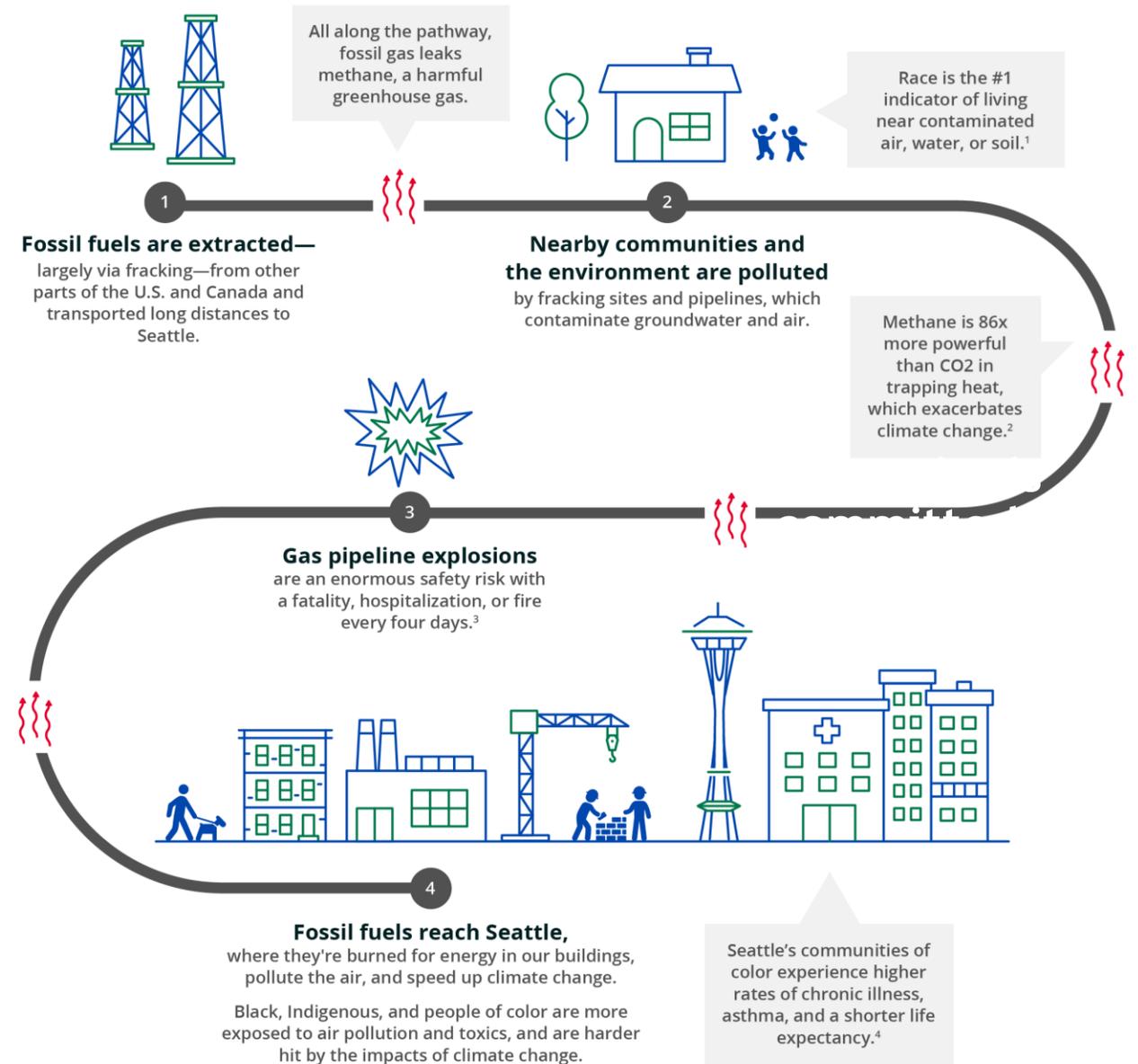
Source: City of Seattle. 2018 Community Greenhouse Gas Emissions Inventory. https://www.seattle.gov/Documents/Departments/OSE/ClimateDocs/2018_GHG_Inventory_Dec2020.pdf

Building Energy
Fuel Use & Impact
COMMERCIAL & RESIDENTIAL



Continuing to power our buildings with fossil fuels is an issue of climate justice.

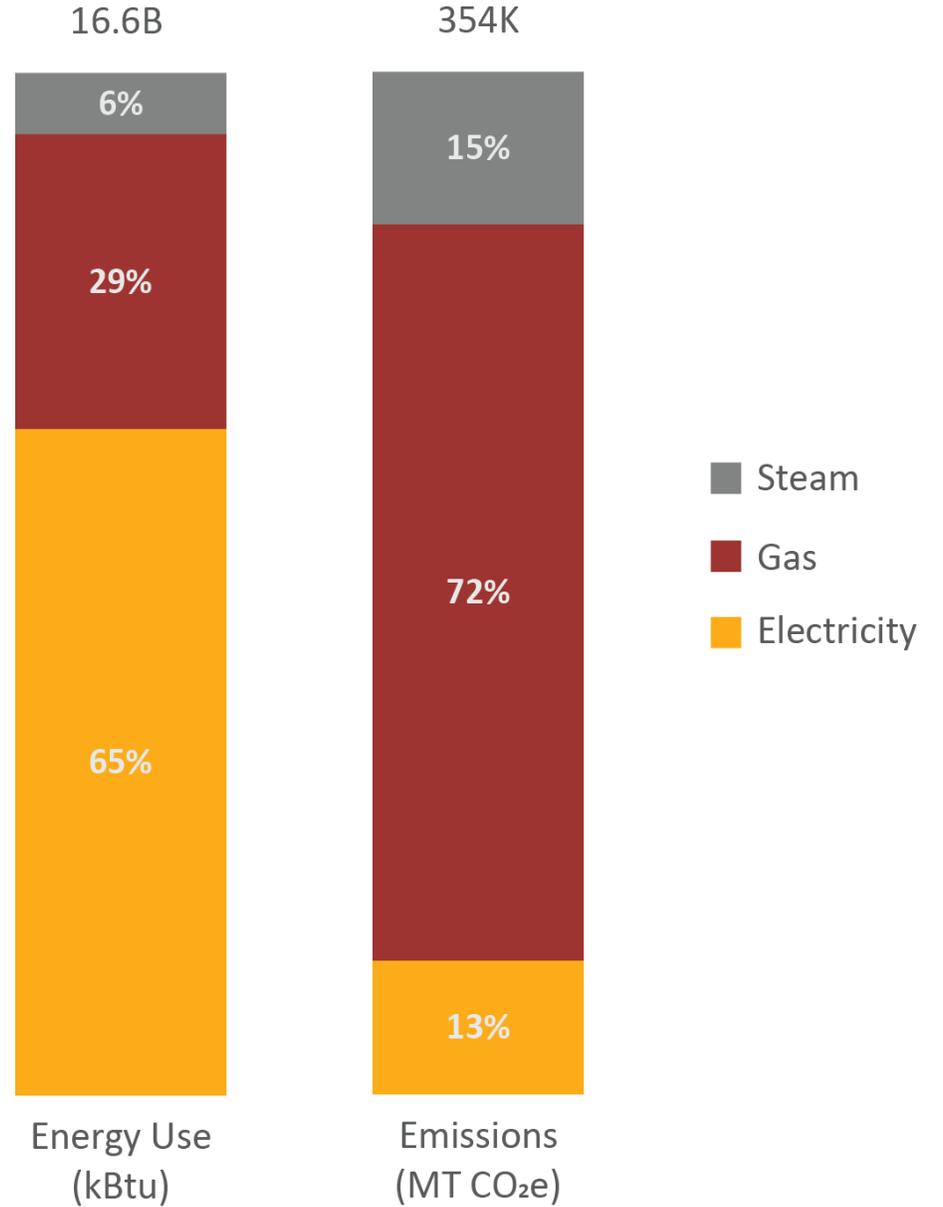
Fossil fuels cause harm along every step of the pathway to our buildings and homes, and disproportionately impact communities of color.

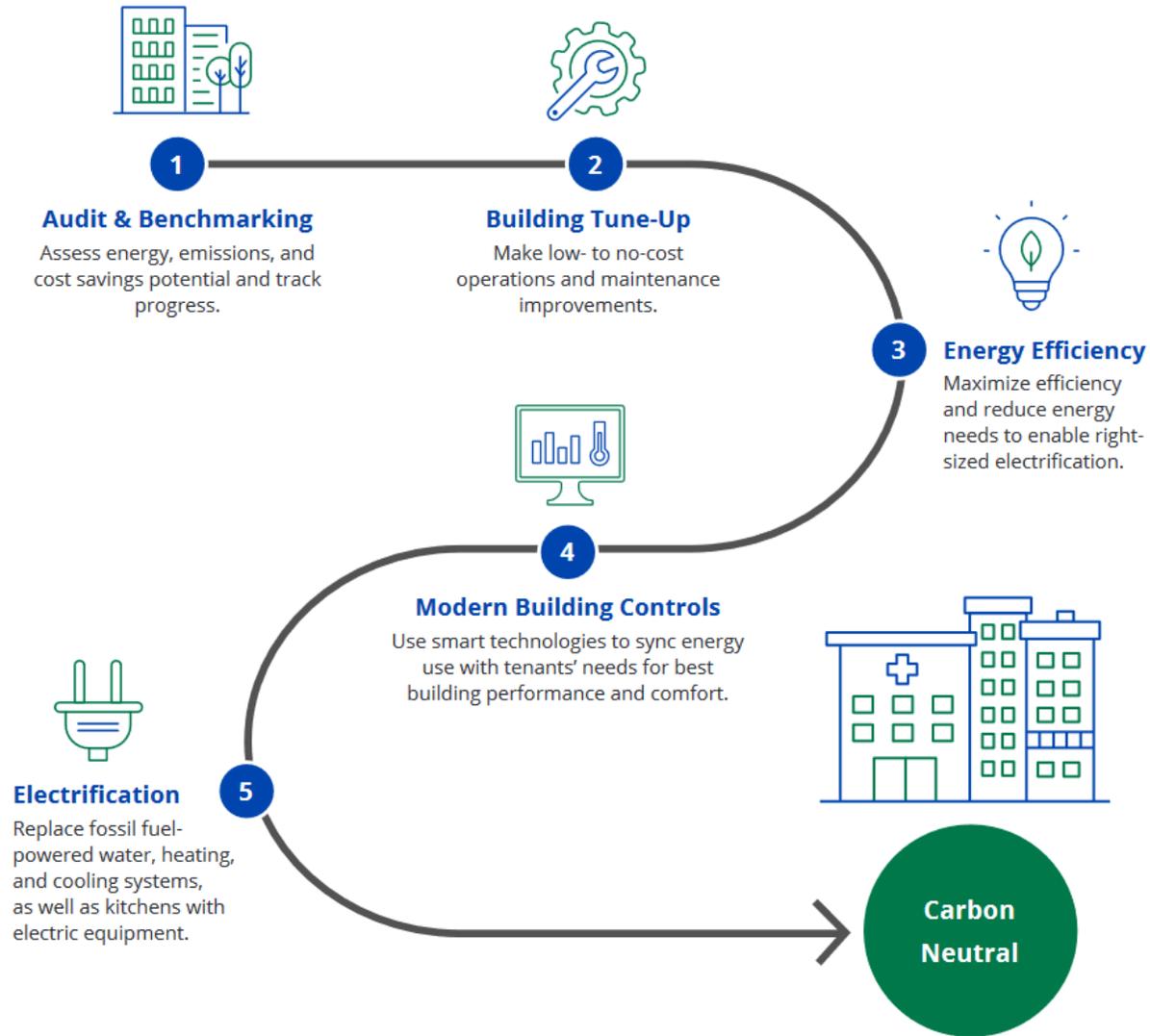


Seattle Carbon-Based Building Performance Standards would target buildings' largest greenhouse gas contributors — gas and district steam (both from fracked gas).

Source: 2019 weather-normalized energy and emissions for Seattle commercial and multifamily buildings 20,000 SF and greater

Energy Use and Emissions (2019)





Solar Energy (Bonus Step)

Install solar panels, where feasible, to generate renewable energy on site.

Seattle Policies for Existing Commercial and Multifamily Buildings

CITY-OWNED BUILDINGS

No new buildings or major renovations with fossil-fuel.
Decarbonize existing buildings by 2035.

SEATTLE ENERGY CODE *Commercial buildings, multifamily over 3 stories*

Reduces energy use and carbon emissions of new and remodeled buildings. Limits fossil fuel and electric resistance for most space and water heating. Applies to equipment replacements in multifamily and hotels.

ENERGY BENCHMARKING *Commercial and multifamily buildings $\geq 20,000$ sf*

Owners of non-residential and commercial buildings report energy performance annually.

BUILDING TUNE-UPS *Commercial buildings $\geq 50,000$ sf*

Optimize energy and water performance of commercial buildings through low- or no-cost operations and maintenance actions.

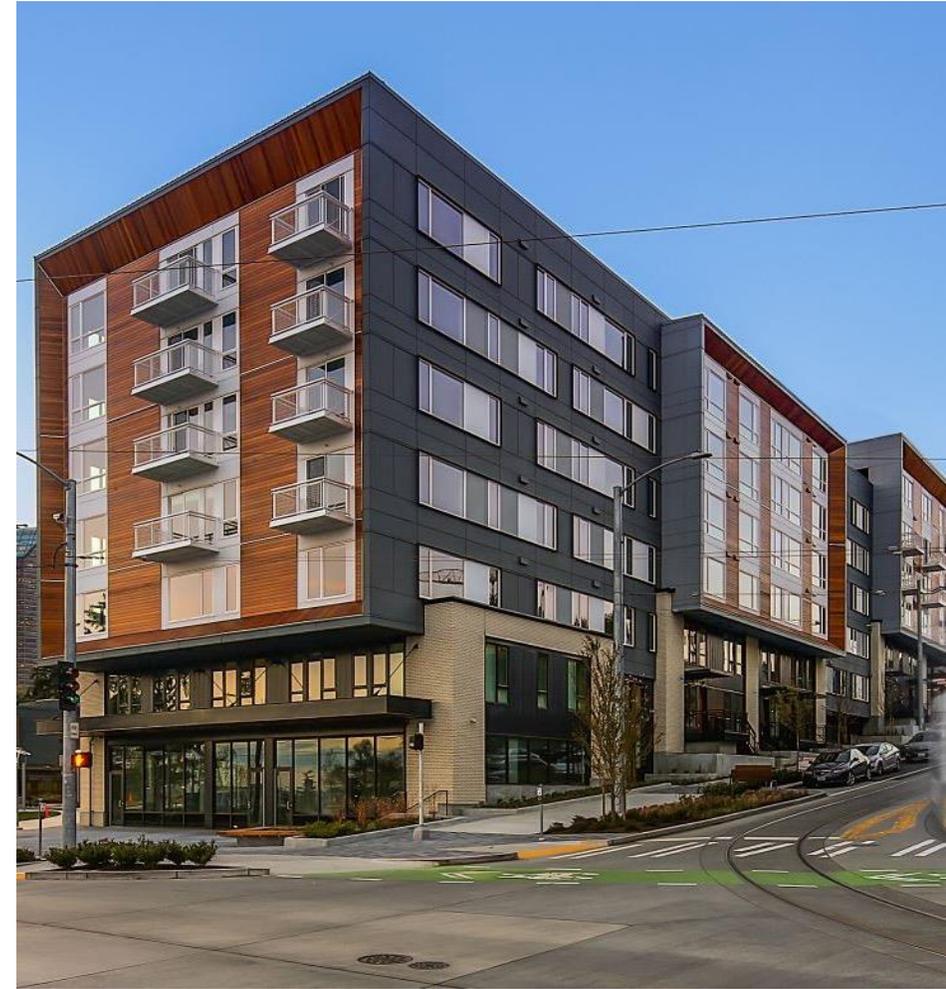


Photo credit: market rate at Yesler Terrace. Runberg Architecture Group.

WA Policies for Existing Commercial and Multifamily Buildings

WA STATE CLEAN BUILDINGS PERFORMANCE STANDARD

Applies to commercial buildings >50,000 sf

- Meet energy use intensity targets (EUI_t - kBtu/SF/yr)
- Develop and adopt an energy management plan
- Develop and implement operations and maintenance (O&M) program
- Compliance deadlines
 - 2026: > 220,000 SF (achieve EUI_t by 2025)
 - 2027: > 90,000 SF
 - 2028: > 50,000 SF
- Early Adopter Incentive Program – launched in 2021
 - Available to commercial *and* multifamily buildings > 50,000 SF
 - 15 EUI or more above target
 - \$0.85 / sf



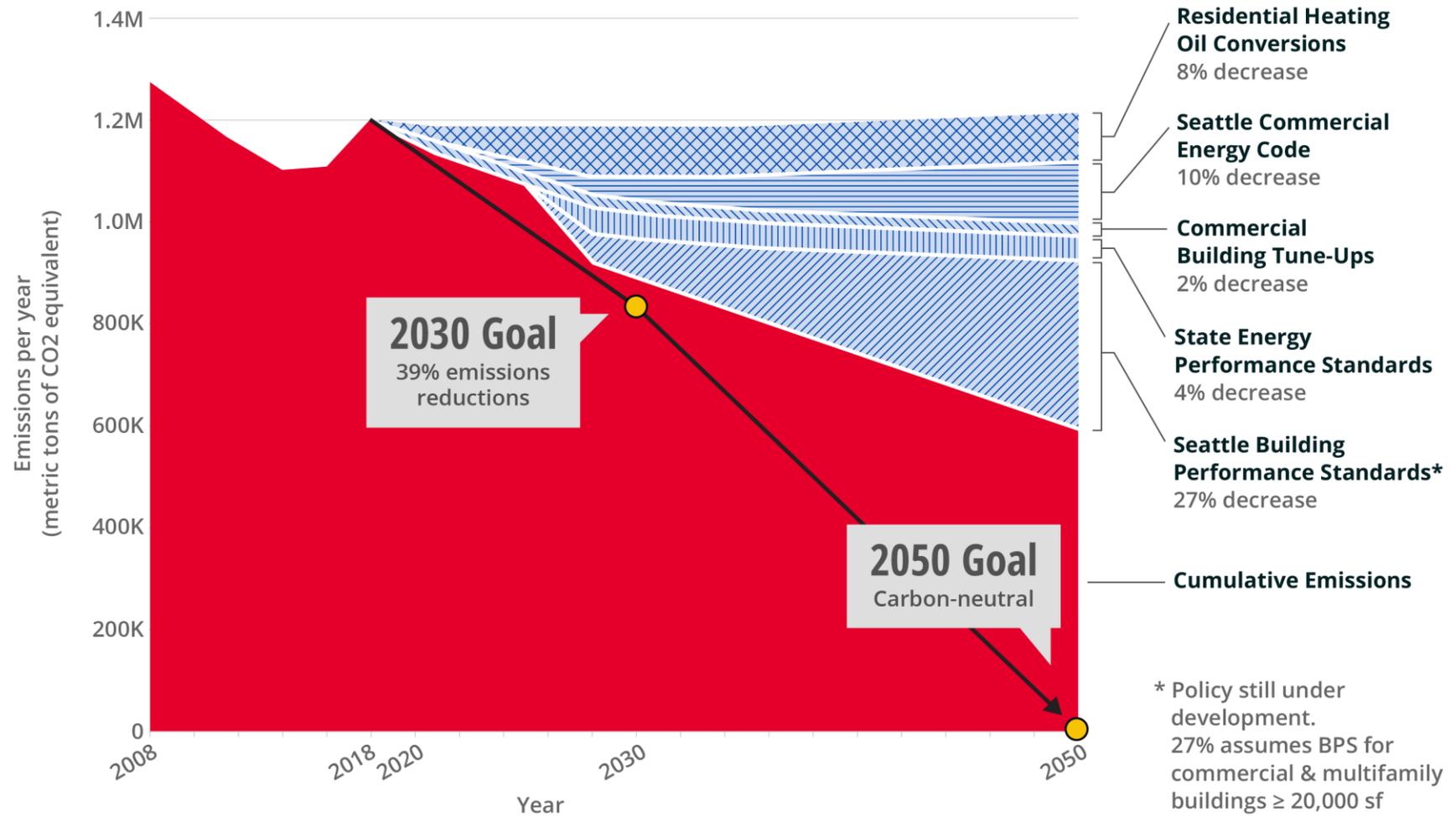
State Energy Performance Standards are projected to bring down emissions 4%.

Projected Seattle Buildings Emissions Reductions



Together, these strategies move Seattle buildings toward net-zero carbon.

Projected Seattle Buildings Emissions Reductions

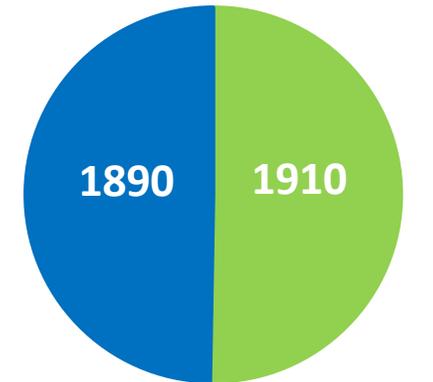




Buildings Landscape

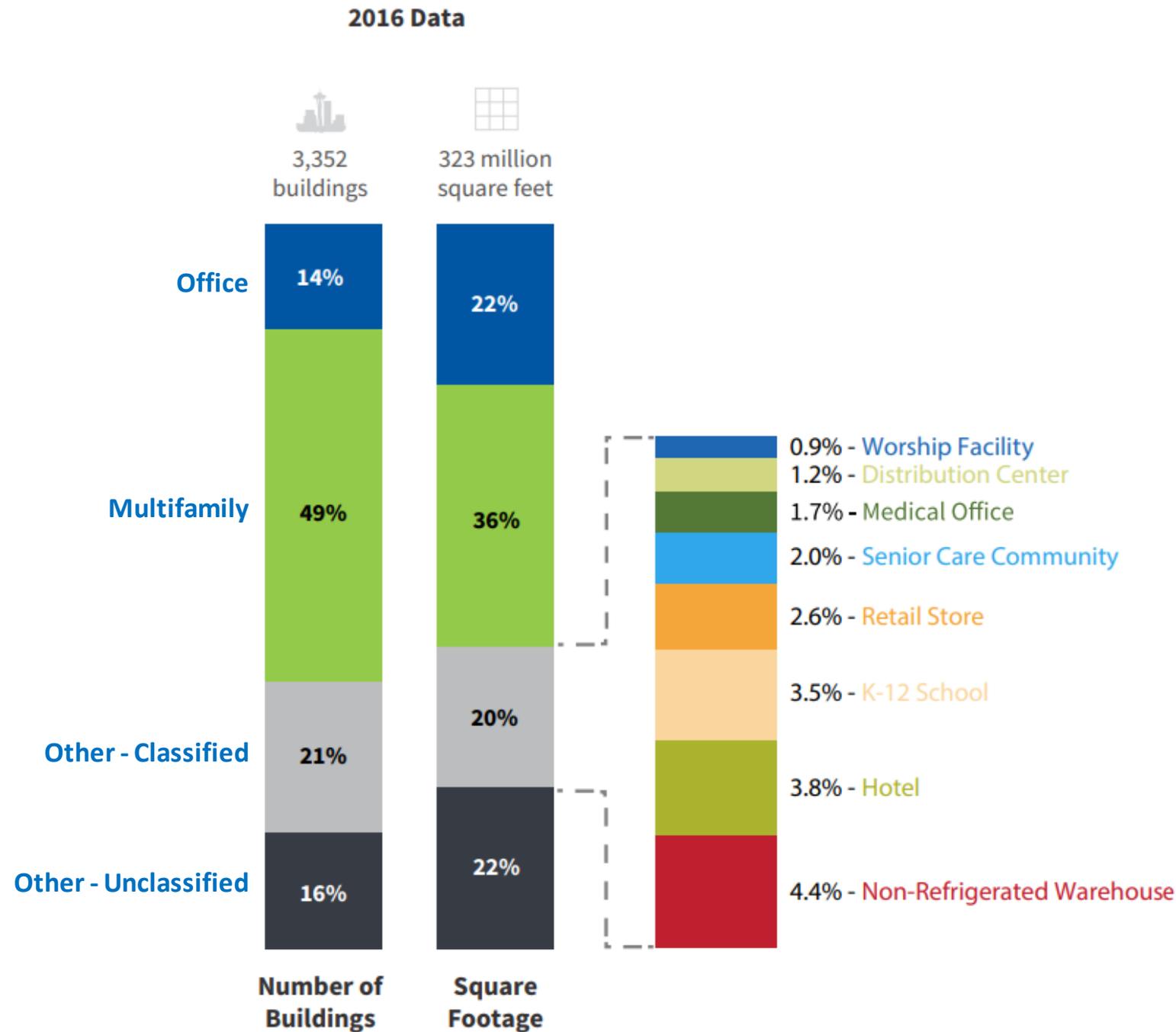
Seattle Buildings 20K SF and Greater - Number and Size

Cohort (State of WA)	Building Sector	# of Buildings	Total SF (M)
220K+ SF	Multifamily	100	34.8
	Nonresidential	210	111.8
90K-220K SF	Multifamily	300	39.9
	Nonresidential	400	56.1
50K - 90K SF	Multifamily	370	24.4
	Nonresidential	430	28.3
20K-50K SF	Multifamily	1140	35.3
	Nonresidential	850	26.7
Grand Total		3800	357.3



■ Multifamily ■ Nonresidential

Building Type Category and Size ($\geq 20K$ SF)



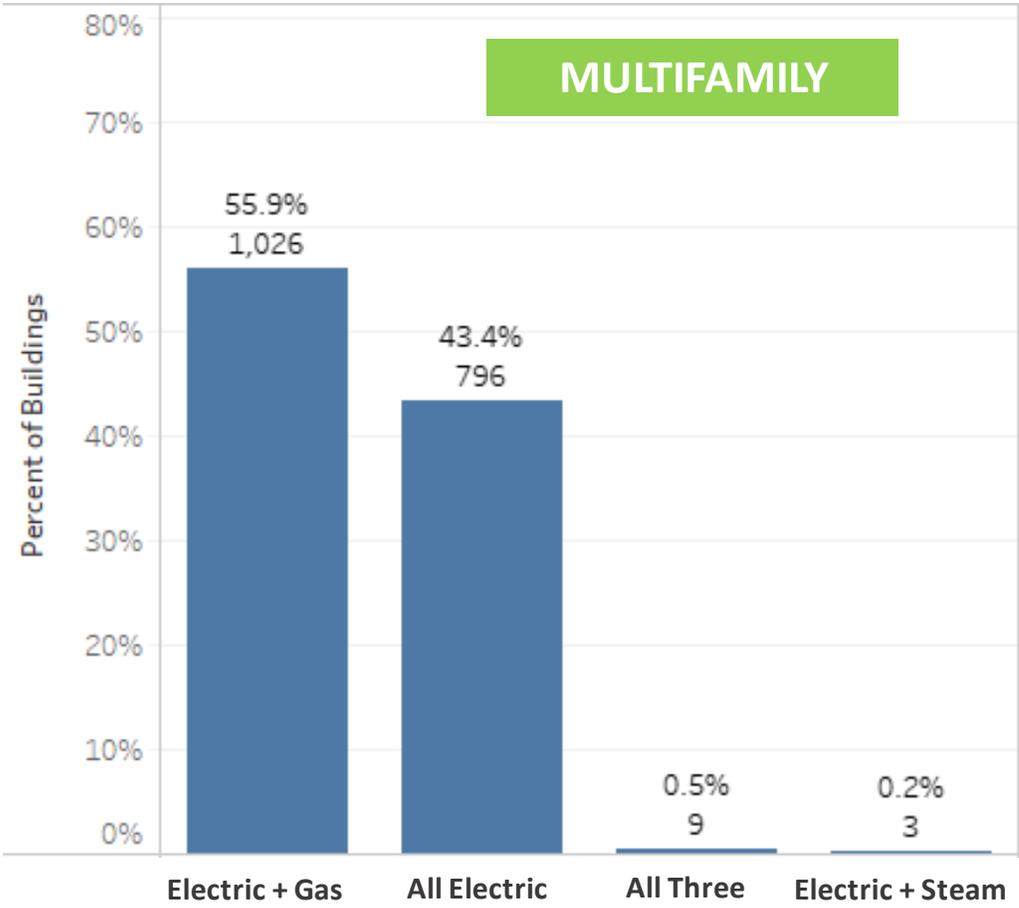
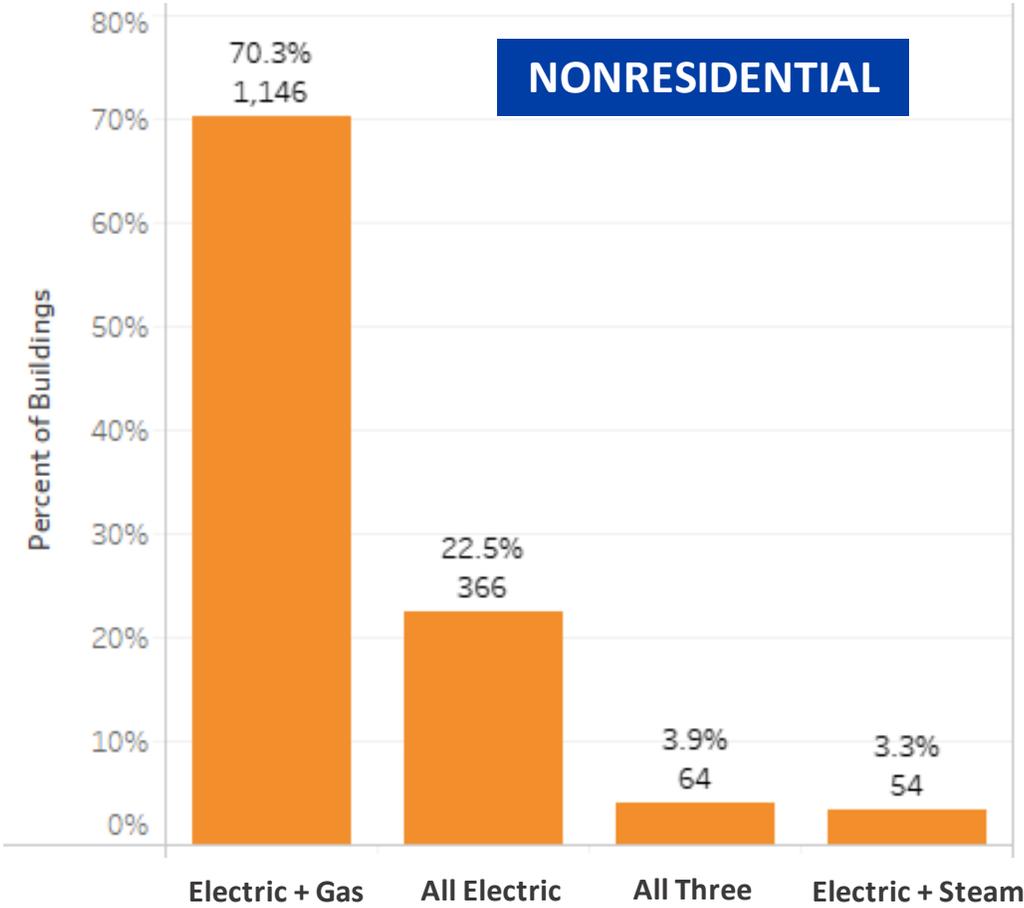
Energy Mix Reported (\geq 20K SF)

Cohort (State of WA)	Building Sector	# of Buildings	All Electric	Electric + Gas	Electric + Gas + Steam	Electric + Steam
220K+ SF	Multifamily	100	5%	91%	3%	0%
	Nonresidential	210	15%	63%	13%	9%
90K-220K SF	Multifamily	300	20%	78%	1%	0%
	Nonresidential	400	18%	69%	6%	7%
50K - 90K SF	Multifamily	370	33%	67%	0%	1%
	Nonresidential	430	25%	70%	2%	2%
20K-50K SF	Multifamily	1140	55%	45%	0%	0%
	Nonresidential	850	24%	72%	2%	1%
Grand Total		3800	33%	63%	2%	2%

Buildings that reported energy benchmarking data in 2019.

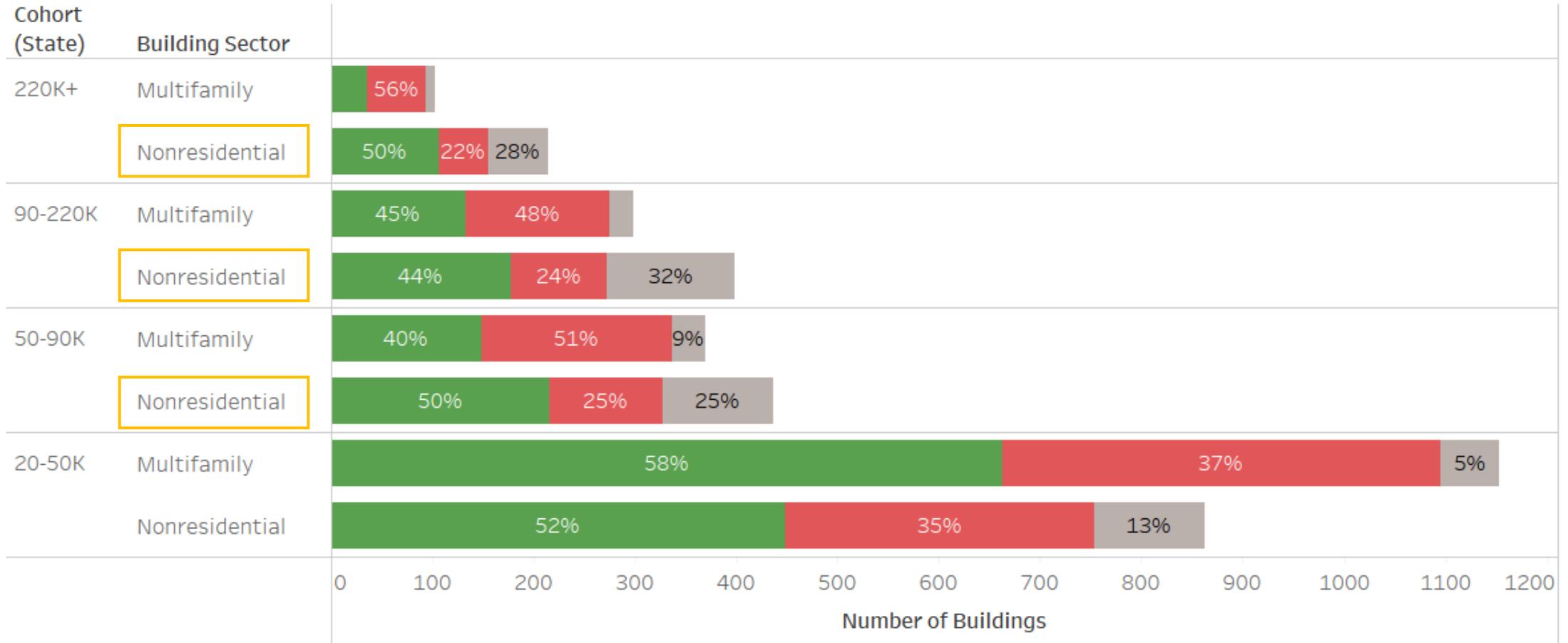


Energy Mix Reported ($\geq 20K$ SF)



Buildings that reported energy benchmarking data in 2019.

WA State Energy Performance Standards (OSE Estimates)



■ NO DATA & NO TARGET
■ DOESN'T MEET TARGET
■ MEETS EUI

= currently required

List of buildings at seattle.gov/building-performance-standards

Earthquake Risk - Unreinforced Masonry "URM" Buildings (≥ 20 K SF)

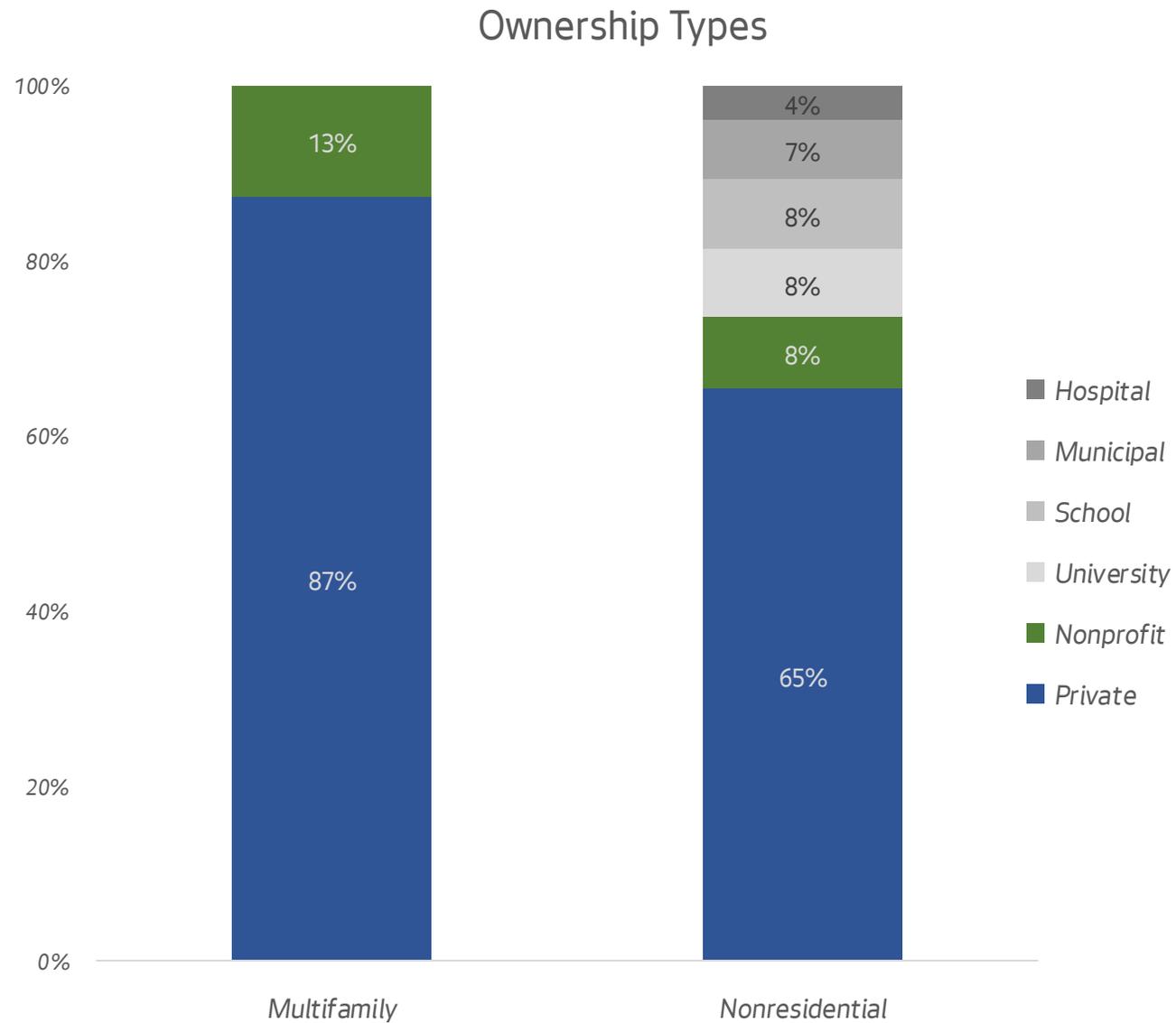
Building Sector	Medium Risk	High Risk	Critical Risk
Multifamily	71	7	0
Nonresidential	55	21	2
Grand Total	126	28	2
<i>% of Total Buildings (N=3800)</i>	3.3%	0.7%	0.05%



1999 Nisqually earthquake damage. USGS photo.

URM List Source: <https://www.seattle.gov/Documents/Departments/SDCI/Codes/ChangesToCodes/UnreinforcedMasonry/ConfirmedURMList.pdf>

Building Ownership Type





Initial Community & Stakeholder Input

Preliminary Stakeholder Conversations

Cost Challenges

- Need for **electrical infrastructure upgrades/space** to accommodate new electrical equipment
- Upgrade costs/needs may lead independent **owners to sell**
- Impact on tenants / rent increases / **potential for displacement**
- **Longer payback cycles difficult** with changes of ownership

Compliance Challenges

- Compliance deadlines should **account for building asset budget cycles**
- Many owners **lack dedicated** staff to manage upgrades/compliance
- **Multiple overlapping policies/regulations** (State Clean Buildings mandate, URM, Tune-Ups, Substantial Alteration)

Jobs & Workforce

- Workforce readiness – **do we have enough skilled workers?**
- **Concern that decarbonization is happening all at once** – interest in incremental approach and incorporating renewable natural gas
- Desire to **package upgrades with larger opportunities** such as URM, refrigeration, pipeline maintenance, etc.



Photo credit: Hopeworks: affordable housing in Everett. Benjamin Schneider photography.

BIPOC Concerns...

“Our community’s top climate concerns are poor air quality, food insecurity, and affordable housing. Access to clean air, healthy and affordable food, and affordable housing are basic human rights that our communities are fighting for on a daily basis. Indigenous, Black, Brown, disabled, female, LGBTQ, and low-income people are hit first and worst by the impacts of climate change, which worsens existing disparities.”

“Transportation and energy infrastructure, programs, and resources meant to benefit our communities **will displace our communities if not accompanied by policies that keep us rooted in place.**”

“Our low-income community members are over-burdened by the high cost of energy bills and often live in energy inefficient homes because of displacement and rising housing costs. Government must subsidize energy efficient upgrades so that everyone, including renters and people who live in older homes, has equal access to their cost-saving benefits.”

“The transition must incorporate existing fossil-fuel workers and prioritize job pathways to frontline communities. The renewable energy transition must generate good jobs for our community, and those jobs must be accessible to all members of our community, not only a privileged few. We must ensure workers entering, or transitioning to, the renewable energy sector can look forward to careers with wage, benefit, and workplace standards that allow workers and their families to thrive.”

Powering the Transition: Community Priorities for a Renewable and Equitable Future - Puget Sound Sage
<https://www.pugetsoundsage.org/research/clean-healthy-environment/community-energy/>



And now... impacts of Covid on small business and communities of color, as well as increases in crime, skyrocketing rents...

Policy Development Framework: — Building Owner Support



Seattle Clean Buildings Accelerator



- **\$220,000 in 2022 budget** (\$20,000 for language access analysis and needs)
- **Concept paper & retrofit studies in 2020/21**
- **RFP posted on Jan 31st to hire consultant to develop, run and strategize for future Seattle BPS-aligned support**
- **Why?**
 - Recognize support is critical, like other cities have
- **Who?**
 - Under-resourced building owners, especially those serving or in BIPOC communities
 - Class B & C
 - Nonprofits
 - Affordable multifamily (especially unsubsidized)



BUILDING ENERGY RETROFIT RESOURCE HUB

One-stop shop for large- and medium-sized Boston buildings to connect with energy efficiency services and technical support.

Seattle Clean Buildings Accelerator (cont.)

What?

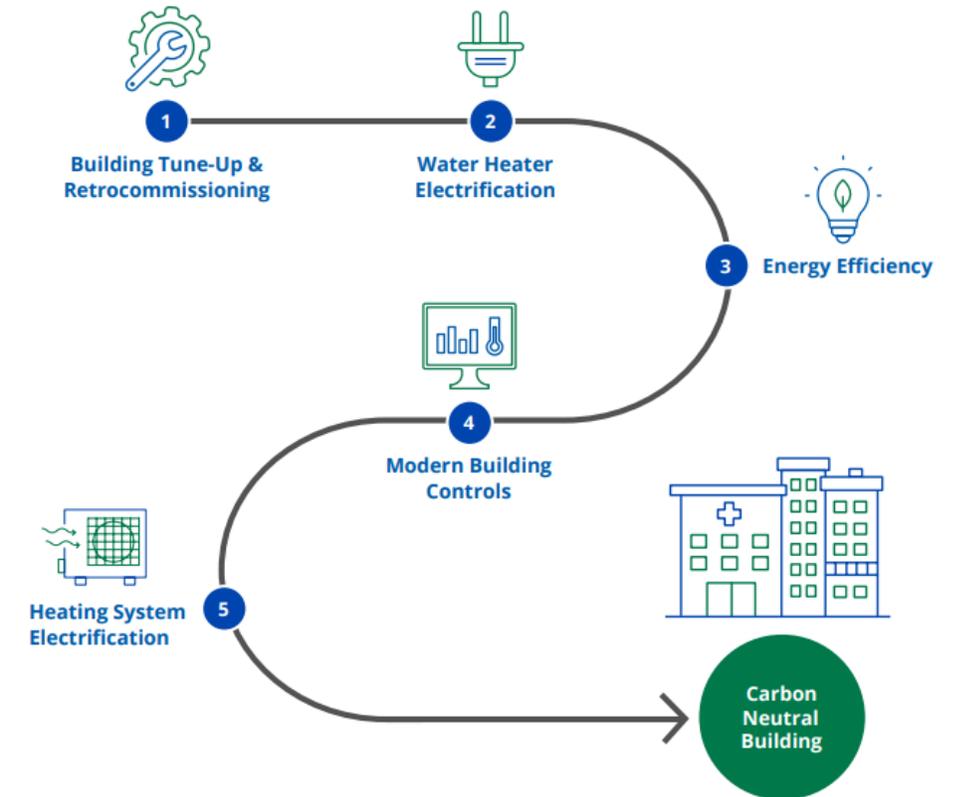
- Helpdesk and curated materials
- Light coaching-style trainings
- SEM for select buildings

Help Participants to...

- Plan to comply with the State Clean Buildings Standards
- Access financial incentives from WA, City Light, etc.
- Explore / understand financing options like C-PACER
- Learn about electrification / decarbonization options... meet Seattle Energy Code, future Seattle BPS..
- *Does not have \$ for capital support*

Steps to carbon neutral for a midsize office building:

Existing buildings can and must be part of a solution to climate change. In this case, the UW Integrated Design Lab and Solarc Energy Group conducted modeling on a typical midsize office building, and identified a five-step path to **reduce energy use by nearly 60 percent and emissions by 92 percent** to achieve an all-electric, carbon neutral building.⁵ An optional solar parking canopy for net zero-energy is also included.



SEATTLE JUSTICE CENTER

610 5TH AVE
SEATTLE WA 98104

Sq Footage	310,490
Type	Other
OSE Building ID	358
Year Built	2001

61 KBTU/FT²
energy use per square foot*

↓ 32% lower than similar buildings.



1.1 KG CO₂e/FT²
emissions per square foot

↓ 47% lower than similar buildings.



*All EUIs are adjusted for weather

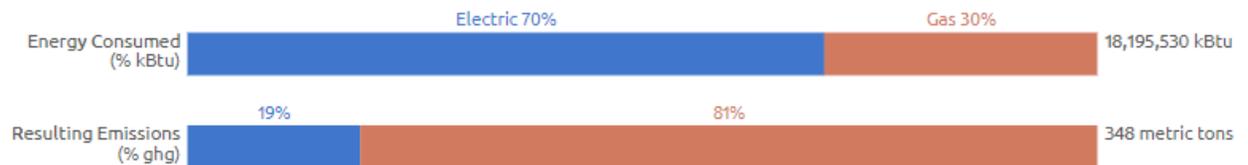
ⓘ New state requirement! Action is required.

This building likely must comply with Washington state's Clean Building Performance Standard. [Learn more below.](#)

CLIMATE POLLUTION IMPACT OF ENERGY USE

Over 90% of Seattle's building emissions come from burning fossil fuels like fracked gas and oil for furnaces, water heaters, and appliances - including gas used to generate steam. In Seattle, all-electric buildings have the lowest emissions.

This building's energy and emissions:



348 MT CO₂e is the equivalent of **74.1 passenger vehicles driven** for one year.

The future is electric! Get started on a path to carbon neutral:

- PLAN** - Track energy use and plan for electrification
- REDUCE** - Maximize efficiency to enable electrification
- ELECTRIFY** - Replace fossil fuel systems with electric ones

Learn more here:

<https://www.seattle.gov/building-performance-standards>

Shifting the message to energy and emissions with a goal of transitioning buildings to carbon neutral energy.

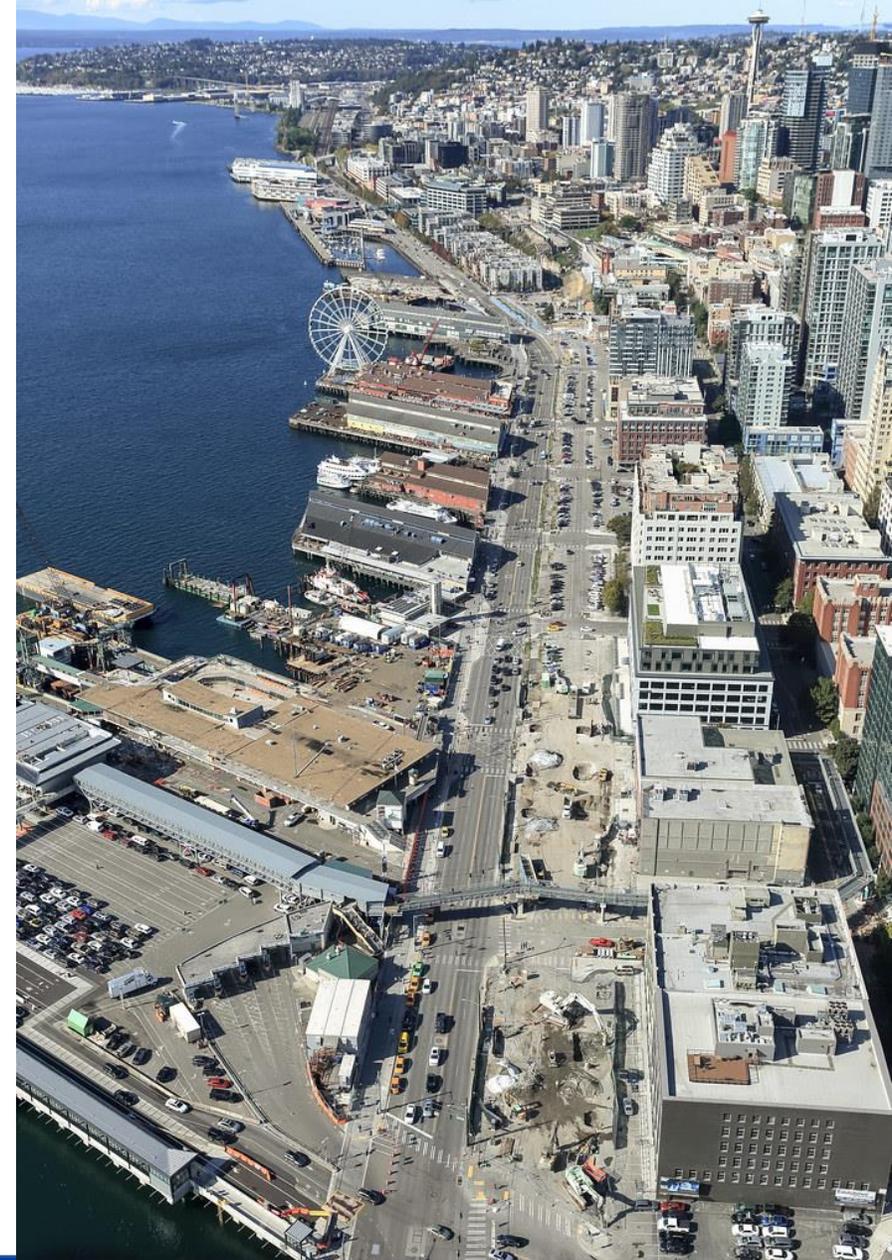
www.seattle.gov/energybenchmarkingmap

Policy Development Framework: Performance Standards



What We Know:

- ❖ Ensure healthier living and working spaces, especially for Seattle's Black, Indigenous, and people of color (BIPOC) communities
- ❖ Reduce pollution as an environmental justice action
- ❖ Mitigate climate change by meeting building related emission reduction targets
 - ❖ Climate Action Plan building sector targets: 40% reduction by 2030; net-zero by 2050 (or earlier)
 - ❖ Commercial: 45% by 2030
 - ❖ Residential: 32% by 2030
- ❖ Utilize SCL's carbon-neutral energy source



Our Directive:

- ❖ Draft policy to the Mayor's Office by July 1, 2022
- ❖ Commercial/multifamily buildings $\geq 20,000$ sq.ft.
- ❖ Net-zero emissions targets no later than 2050
- ❖ Initial emission reduction targets for the largest cohort of buildings beginning no later than 2026

Tentative process

- ❖ Legislation to Council in late 2022
- ❖ Rulemaking in 2023
- ❖ Concurrent development of complementary support programs / initiatives

A.Davey *Seattle Skyline*



Conceptual Policy Approach

- ❑ Priorities: **equity, climate mitigation, health & resilience**
- ❑ Focus on **GHG emissions reductions**, while recognizing critical role of overall resource efficiency.
- ❑ A **coordinated existing buildings approach**: benchmarking, building tune-ups, performance.
- ❑ Timing and criteria **coordinated** with State Clean Buildings Performance Standard
- ❑ **Long-term expectations** to allow owners time to plan.
- ❑ **Phased in over time** by building size, type and equity considerations.
- ❑ **Programs and financial incentives** to support equity and workforce development



A close-up, low-angle shot of a corrugated metal roof. The roof panels are light-colored and run diagonally across the frame. Strong shadows from horizontal blinds are cast across the roof, creating a rhythmic pattern of light and dark bands. The text 'Technical Advisory Group Process' is centered in white, bold font.

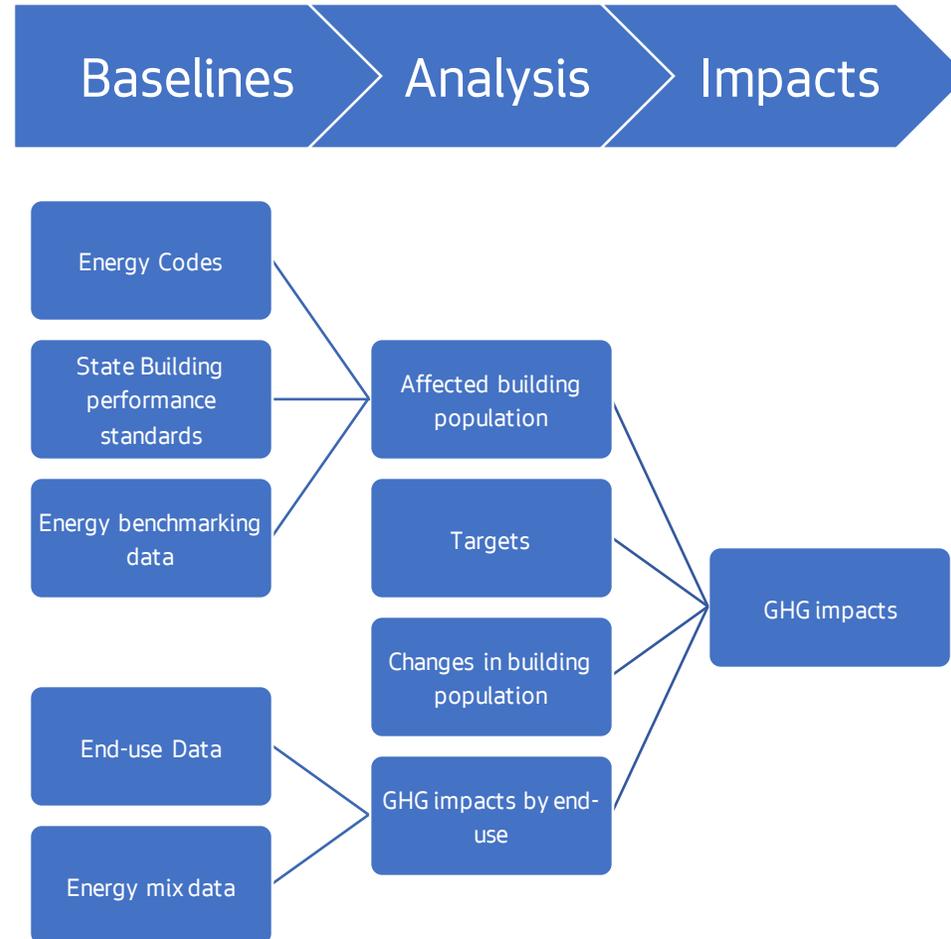
Technical Advisory Group Process

TAG Process Tracks with Policy Design Structure

TAG Meeting	Draft Topics
Meeting #1	<ul style="list-style-type: none"> • Today: introduction, background, context
Meeting #2	<ul style="list-style-type: none"> • Policy parameters: discussion on ordinance vs rule; zeroing in on TAG focus and priority near-term decisions • Design criteria: input on how to define/assess a successful and equitable GHG BPS policy • Covered buildings: recap property type, size, vintage considerations • Metrics: overview discussion on possible metrics, structures, and key considerations
Meeting #3	<ul style="list-style-type: none"> • Metrics cont.: input on how to structure Seattle carbon-based metric and other relevant metrics • Targets: final performance targets, interim targets, vintage distinctions, property type distinction?, etc.
Meeting #4	<ul style="list-style-type: none"> • Targets cont.: finalize input on targets in relation to compliance intervals • Compliance intervals: how many cycles, timing of cycles, relationship with final and interim targets?
Meeting #5	<ul style="list-style-type: none"> • Compliance intervals cont.: finalize input on compliance intervals • Punchlist items: wrap on any new or unaddressed topics/ideas
Meeting #6	<ul style="list-style-type: none"> • Market perspective: considering TAG input on policy design, what key market shifts are needed to ensure a successful carbon-based BPS? How can the City help support this transition as part of the core policy design and/or other policies and programs? • Closing: Synthesis and summary of TAG process and input.



Policy Impact Analysis Framework



Next Step: TAG Meeting #2, Thursday, February 17th

- **Policy Parameters**
 - Discussion on ordinance vs rule; zeroing in on TAG focus and priority near-term decisions
- **Design Criteria**
 - Input on how to define/assess a successful and equitable GHG BPS policy
- **Covered Buildings**
 - Recap property type, size, vintage considerations
- **Metrics**
 - Overview discussion on possible metrics, structures, and key considerations



TAG Process Q&A



- www.seattle.gov/building-performance-standards
- Share comments at cleanbuildings@seattle.gov

