

Seattle Building Emissions Performance Standard (BEPS) for Existing Buildings

Seattle AIA Committee on the Environment

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OFFICE OF SUSTAINABILITY & ENVIRONMENT**

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City of Seattle

"Advancing meaningful climate action – like this policy – to create healthy communities, clean buildings, and good jobs is a priority for my administration"

*Mayor Bruce Harrell,
BEPS Press Release, November 15, 2023*

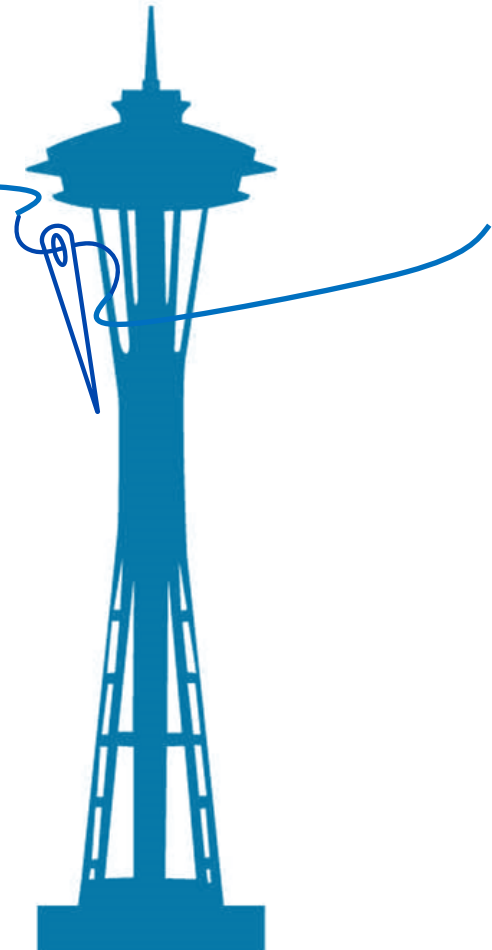
"Addressing our climate crisis is one of the greatest challenges of our time. We need to act swiftly and take big swings. This legislation does just that and will significantly move the needle on reducing emissions in Seattle."

*Councilmember Lisa Herbold,
BEPS Press Release, November 15, 2023*



Policy addresses multiple priorities

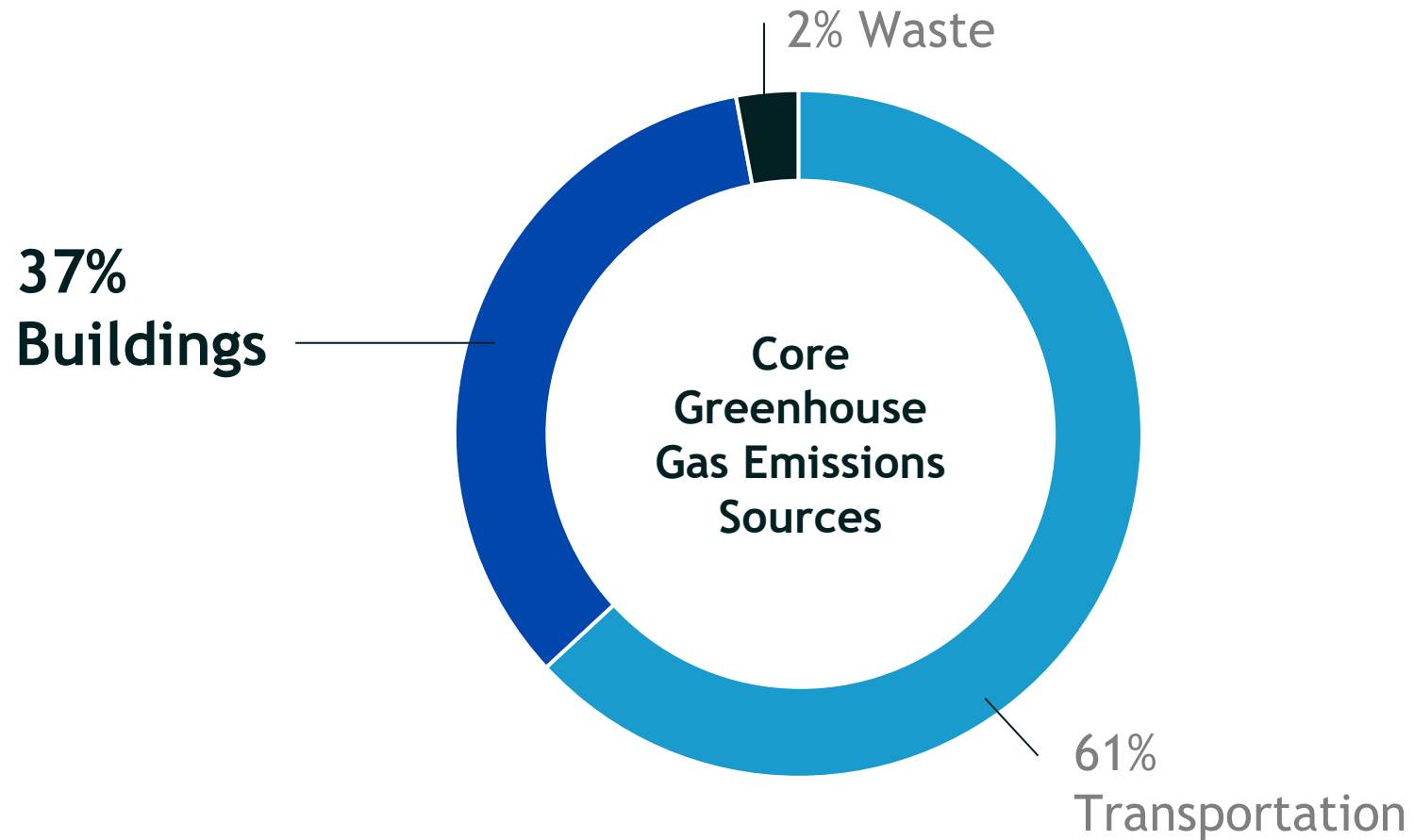
Climate crisis and pollution
Environmental justice
Downtown revitalization
Equipment life cycles and market signals
Workforce and a just transition
Affordable housing and human services
City-owned building portfolio



Context

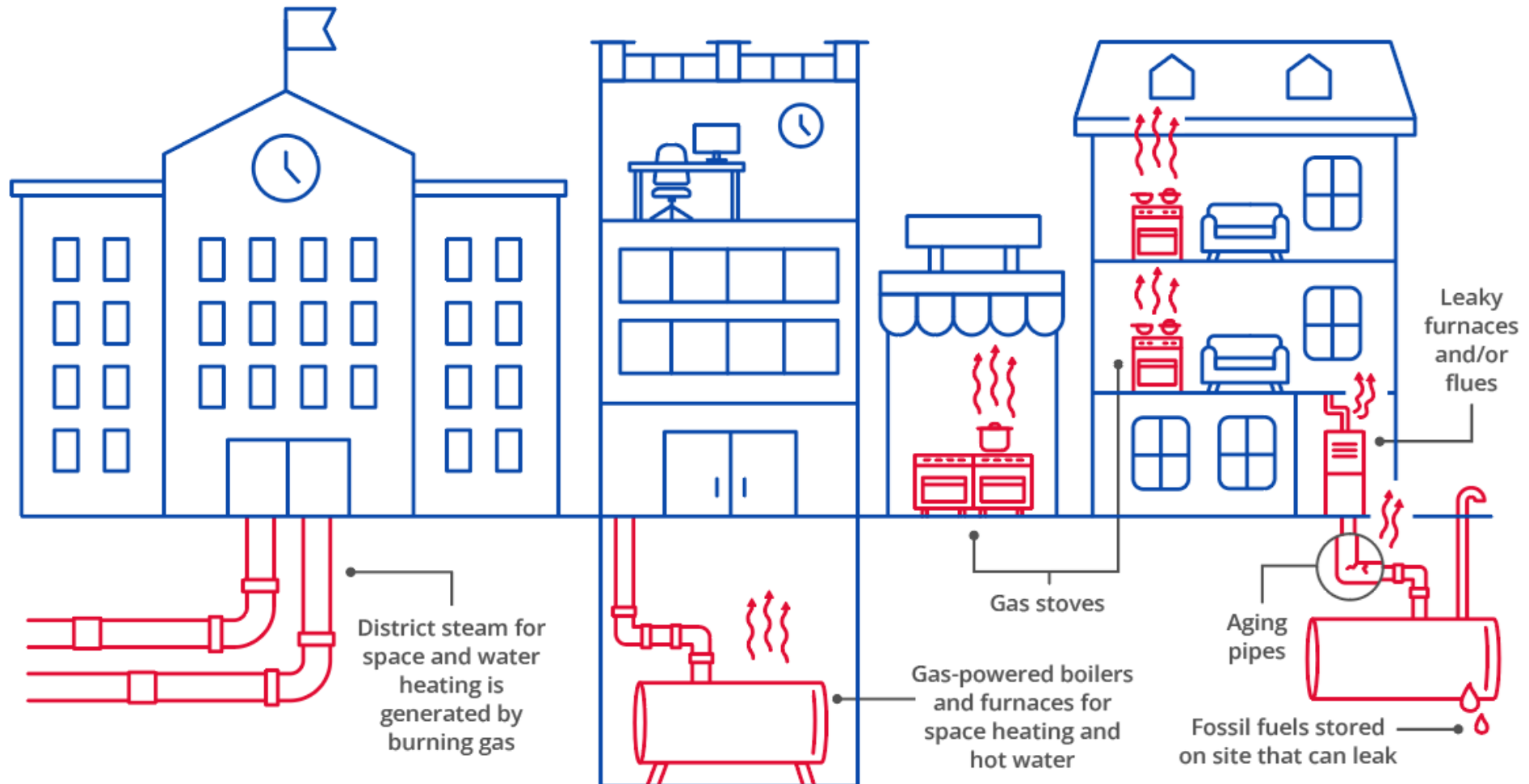


Buildings are one of the largest sources of Seattle's climate pollution

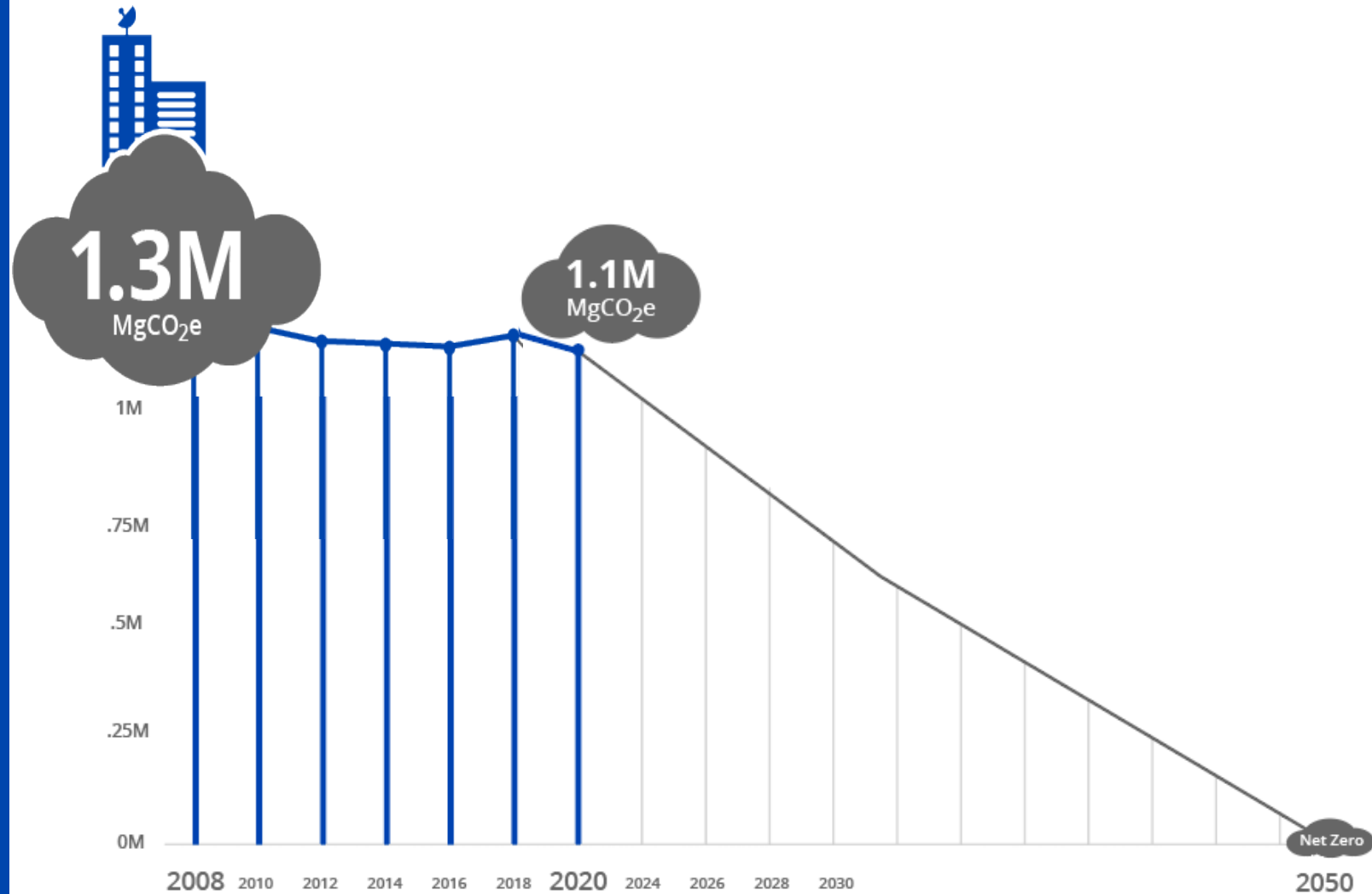


Source: 2020 Seattle Greenhouse Gas Emissions Inventory

Building-related emissions mostly come from burning fossil fuels, like gas and oil



Bold action is needed to significantly reduce climate emissions from buildings



Seattle's Building Emissions Performance Standard for larger, existing buildings is one of the most effective actions we can take now

27% building emissions reduction by 2050.
(10% of core emissions)

Core emissions includes transportation, buildings, and waste



Sets carbon-emissions-reduction targets that existing buildings must meet over time.



Identifies long-term expectations so owners can plan for upgrades that improve energy efficiency and transition to cleaner energy sources.



Offers flexibility to choose technologies and operational strategies that work best for each owner.

Benefits of carbon-based building performance standards and energy efficiency



Greater efficiency can mean cost savings for owners and tenants



Improved comfort



New well-paying jobs in clean energy and energy efficiency



Safer communities – reduced risk of gas leakage, accidents, and contamination



Cleaner air indoors and outdoors



Lower carbon emissions

Progressive policies have been preparing building owners to take action



2011

Seattle Energy Benchmarking and Reporting



2019

Seattle Building Tune-Ups



2020

Fossil Fuel-Free Municipal Buildings



2021

2018 Seattle Energy Code



2026





2019 WA State Clean Buildings Standards



Seattle Building Emissions Performance Standard

Seattle Building Emissions Performance Standard (BEPS)

Building Owner Requirements - every 5 years

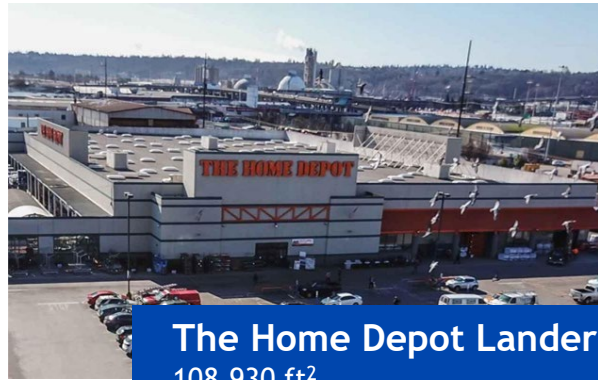
-  **Measure** and verify building energy use and GHG emissions
-  **Plan & Identify:** Document current performance & equipment, and actions to achieve targets
-  **Meet Green House Gas Emissions Targets:** Three pathways
-  **Achieve:** Net-zero emissions (with narrow exceptions) by 2050

Building Tune-Ups proposed to sunset after the 2023-2026 compliance cycle is done.

~4,100 Nonresidential & Multifamily Existing Buildings >20,000 square feet



F5 Tower
960,655 ft²



The Home Depot Lander
108,930 ft²



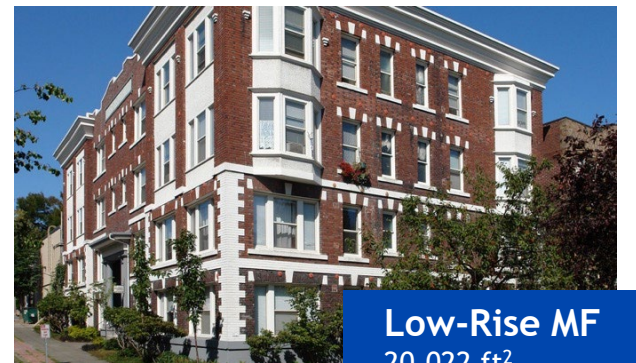
Yesler Community Center
29,500 ft²



High-Rise MF
314,000 ft²



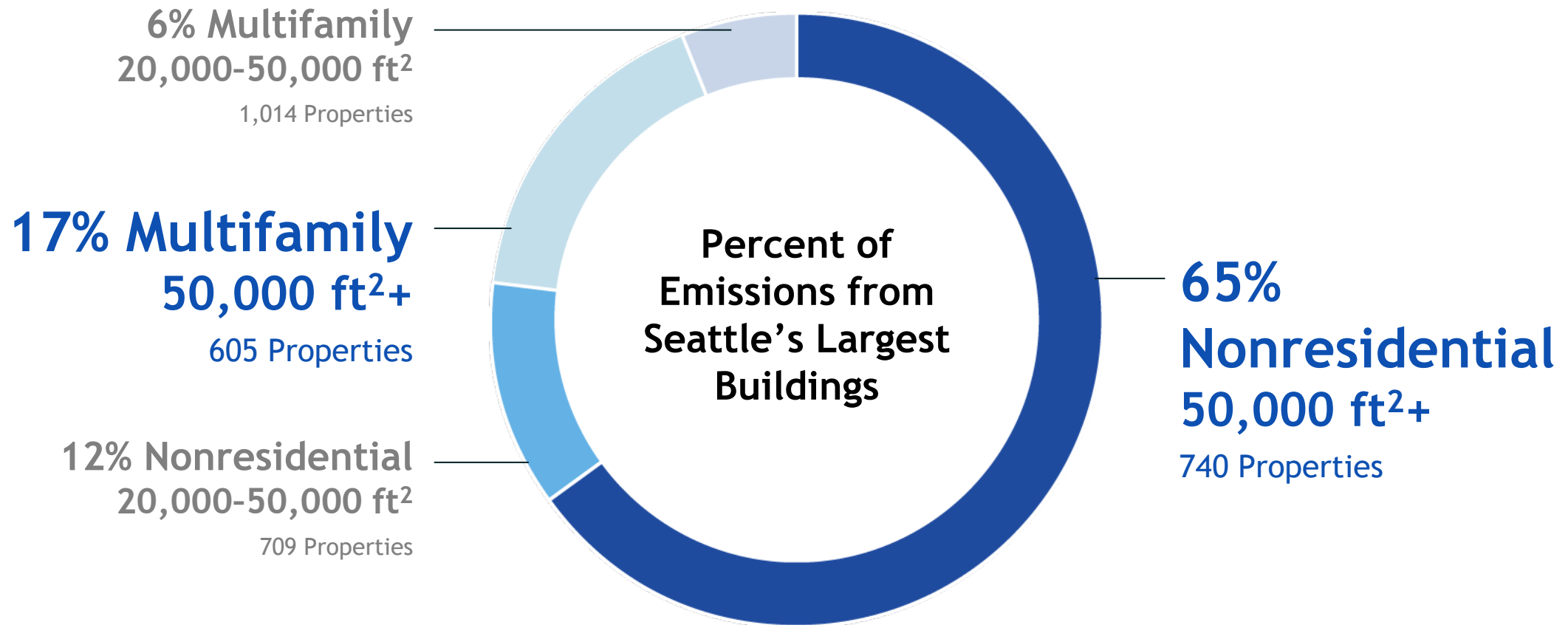
Mid-Rise MF
103,100 ft²



Low-Rise MF
20,022 ft²

(Buildings not included: new construction (covered by Energy Code), industrial/manufacturing, small commercial and multifamily, single-family)

Seattle BEPS will focus on nonresidential and multifamily buildings >20,000 SF



Measuring building emissions performance



Gas



Electric



Steam



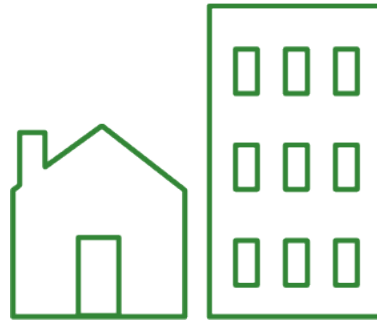
District

Total annual weather normalized fuel use for each energy source (kBtu/year)

X

Emissions Factor of each energy source (kgCO₂e/kBtu)

= total kgCO₂e/year



Building's total square feet (ft²)
(excluding parking)

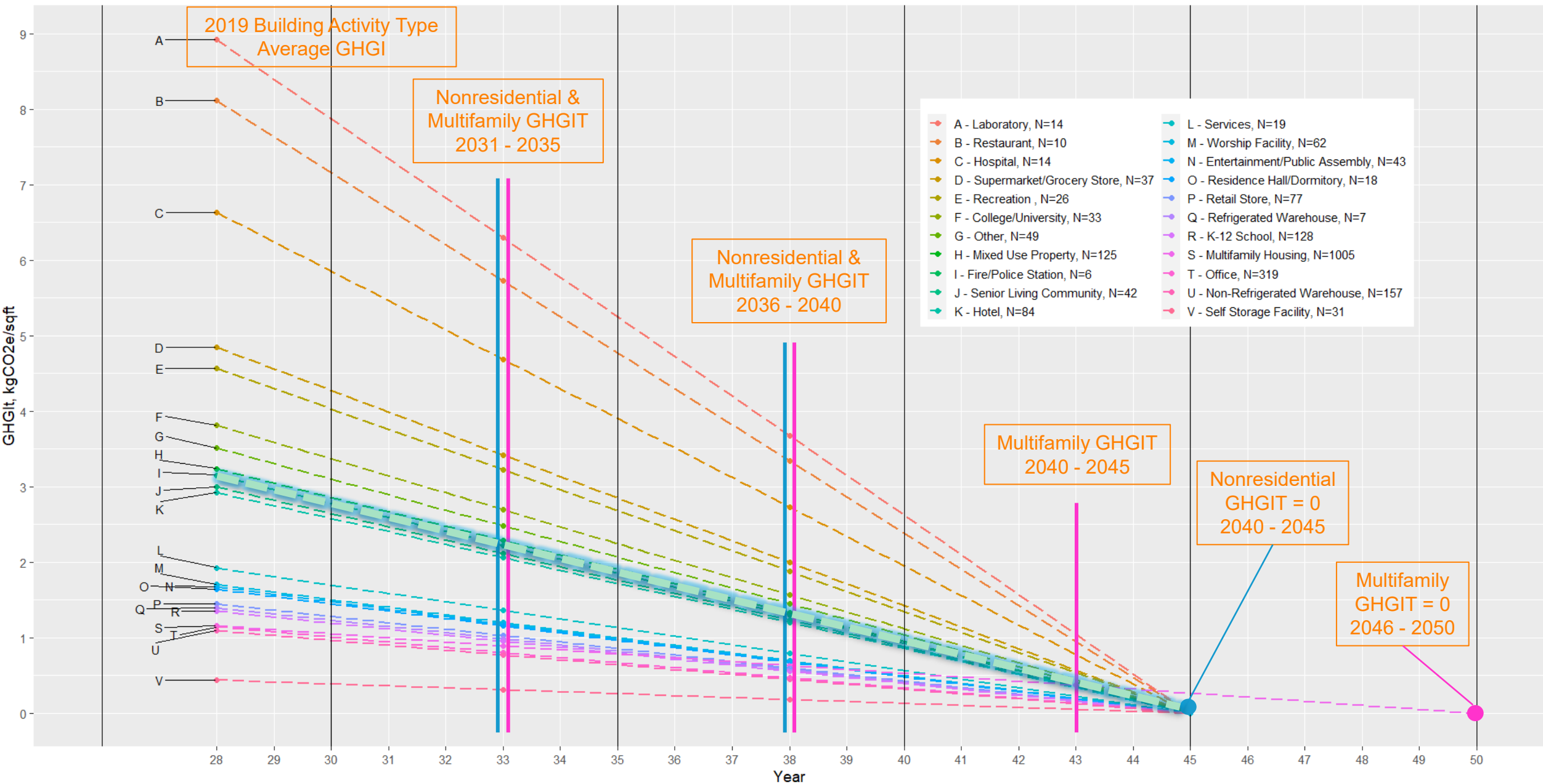


GreenHouse Gas Intensity
(GHGI)
(kgCO₂e/ft²/year)

CO₂e is carbon dioxide emissions equivalent

Emissions Factor is the CO₂e associated with a unit of energy

Greenhouse Gas Intensity Targets (GHGIt)



GHGI Targets (GHGIT) in proposed Seattle BEPS (KGCO₂e/SF/YR) from Nov. 2023 (Table A)

Building Activity Type	2019 Baseline Average	2031 - 2035	2036 - 2040 ¹	2041 - 2045 ^{1, 2}	2046 - 2050 ^{1, 3}
College/University	3.81	2.69	1.57	0	0
Entertainment/ Public Assembly	1.67	1.18	0.69	0	0
Fire/Police Station	3.15	2.23	1.30	0	0
Hospital	6.63	4.68	2.73	0	0
Hotel	2.92	2.06	1.20	0	0
K-12 School	1.35	0.95	0.56	0	0
Laboratory	8.93	6.30	3.68	0	0
Multifamily Housing	1.16	0.89	0.63	0.37	0
Non-Refrigerated Warehouse	1.09	0.77	0.45	0	0
Office	1.14	0.81	0.47	0	0

Building Activity Type	2019 Baseline Average	2031 - 2035	2036 - 2040 ¹	2041 - 2045 ^{1, 2}	2046 - 2050 ^{1, 3}
Other	3.51	2.48	1.45	0	0
Recreation	4.56	3.22	1.88	0	0
Refrigerated Warehouse	1.39	0.98	0.57	0	0
Residence Hall/ Dormitory	1.64	1.16	0.68	0	0
Restaurant	8.12	5.73	3.34	0	0
Retail Store	1.45	1.03	0.60	0	0
Self-Storage Facility	0.44	0.31	0.18	0	0
Senior Living Community	2.99	2.11	1.23	0	0
Services	1.93	1.36	0.79	0	0
Supermarket/ Grocery Store	4.85	3.42	2.00	0	0
Worship Facility	1.7	1.20	0.70	0	0

1 – Targets may be revised by future rule, per subsection 925.070.A.

2 – Net-zero emissions by 2041-2045 for nonresidential.

3 – Net-zero emissions by 2046-2050 for multifamily housing.

4 – Pursuant to Section 22.925.110, owners of low-income housing, human service use, and low-rent housing may receive an extension from meeting the GHGITs in 2031-2035 but still must meet benchmarking verification and all other reporting obligations for 2031-2035.

Impactful action, time to plan & prepare

2022 - 2026	2027 - 2030	2031 - 2035	2036 - 2040	2041 - 2045	2046 - 2050	
Policy Development / Support Program	Verify Energy & Emissions, Plan, and Start Reductions	Nonresidential Emissions Targets			Net-Zero Targets	
		Multifamily Emissions Targets*			Net-Zero Targets	
	Support & Early Adopter Incentives	*Extension for affordable housing & human services until 2036-2040 to meet targets.				

State of WA Clean Buildings Performance Standard

2026 - 1 st Energy Targets Commercial >50K	2031 >> Future Energy Targets - To be Determined by Rule Commercial & Multifamily >20K
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Timing: Phased by building size in each five-year compliance interval

2027 - 2030

2031 - 2035

2036 - 2040

2041 - 2045

2046 - 2050

Year 1

Year 2

Year 3

Year 4

Year 5

>220,000 SF

90,001 - 220,000 SF

50,001 - 90,000 SF

30,001 - 50,000 SF

20,001 - 30,000 SF

An aerial photograph of a city, likely Seattle, showing a large body of water (the Elliott Bay) in the foreground, a dense urban area with a prominent skyline in the middle ground, and a snow-capped mountain (Mount Rainier) in the background under a blue sky with light clouds. The text "Net-Zero Emissions Examples" is overlaid in the center of the image.

Net-Zero Emissions Examples

Stewart Manor Affordable Housing

An energy efficiency and electrification path to carbon neutral

Stewart Manor Case Study

Owner: Seattle Housing Authority

Consultants: UW Integrated Design Lab,
Solarc, Seattle Office of Housing



Credit: UW Integrated Design Lab

**CONCEPT PLAN - Energy efficiency,
health, and decarbonization strategies**

Heat Pump Water Heating

Energy Recovery Corridor Ventilation

Heat Pump Cooling in Community Room

Roof Insulation

Total Estimated Decarbonization Cost (2021): \$205,500

Total Estimated Overall Cost (2021): \$403,500

Energy reduction: 35%

Fossil fuel reduction: 100%

Washington State Department of Services for the Blind

An energy efficiency and electrification path to carbon neutral



Credit: Seattle OSE

Services for the Blind Case Study

Owner: WA Dept. of Enterprise Services

Consultants: UMC

****COMPLETE - Energy efficiency, health, and decarbonization strategies**

New Windows

Lighting Upgrade

Mechanical Controls & Distribution

Dedicated Outdoor Air Ventilation

Heat Pump Hot Water

Heat Pump Heating & Cooling

	Like for Like Replacement	Renewal & Decarbonization
Scope of Work (beginning 2018)	Gas Boiler & Chiller	**
Project Cost	\$990,000	\$2,723,000
City Light Incentives		\$23,200
Total Cost of Ownership (30 years)	\$5,034,754	\$3,929,970

Energy reduction: 70%

Fossil fuel reduction: 100%



Pathways to Compliance

Three compliance pathways for greatest flexibility

PATH A:

Meet standard or portfolio GHG emissions targets at each five-year compliance interval



Compliance includes:

Measure Energy & Emissions
Energy/Emissions Reduction Planning
Meet Targets
Achieve Net Zero by 2041-2050

PATHS A & B:

Early Adopter Incentives
and Technical Support

PATH B:

Small variances but overall can meet compliance with modifications.



Extensions:

Get a bye on one or more compliance intervals before returning to Path A

End Use Deductions:

Meet Path A with certain emissions deductions (e.g. restaurant cooking)

Compliance Payment:

Payment in lieu 2031-2035; revenue supports under-resourced buildings.

PATH C:

Special consideration and flexibility due to unique circumstances.



Decarbonization Plan:

Must include energy/GHG emissions audit and cost analysis.

- Net-Zero by 2050
- Low-Emissions by 2050

Path A flexibility

- **Greenhouse gas intensity targets** (GHGIT) are **provisional after 2031-2035** and may be adjusted by rule
- **Emissions factors are provisional** and will be adjusted by rule as utility energy mixes change.
- Campus, connected buildings and **portfolio compliance** based on aggregate GHGIT of space types in building
- **Alternate GHGIT** based on baseline of individual building(s)
 - campus, connected buildings, or public/nonprofit portfolio
 - Building without an activity type or > 50% as 'other'
 - Buildings with GHG intensity 3.5 times the standard GHGIT

Path B flexibility

- 2031-2035 **Alternative Compliance Payment**
- GHGIT extensions for financial distress or **high vacancy**
- End-use deductions for
 - Commercial and residential **cooking** (2031-2040)
 - **High intensity equipment** in hospitals, labs, hotels (2031-2040)
 - **District energy contract** in place (e.g., CenTrio Customer) (2031-2035)
 - **Backup power**
 - **Backup heating** in hospitals and labs
 - Electric vehicle charging
 - Equipment within individual residential **condominium units**
- **Multifamily Prescriptive Path:** Convert hot water or HVAC equipment to heat pump or in-unit electric resistance (per code)
- **Low-income / low-rent housing and human service uses** eligible for GHGIT extension to 2036-2040.
- **Low-income housing** eligible for GHGIT extension to 2041-2045 if **not yet reached refinancing date**

PATHS A & B Most Buildings Proposed GHGI Targets (GHGIT)

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Path C flexibility

Customized
Decarbonization
Compliance Plan
Net-Zero by 2050
or Low-Emissions
by 2050

May be used for
buildings with:

- **District campus** (served by common energy system)
- Conflict with **landmark or historic district designation**
- Concurrent **substantial alteration** and/or **seismic** upgrade
- Equipment not yet at **life expectancy**
- Disruption to a non-interruptible **research function**
- Actions to meet targets conflict with an **existing lease**
- **Structural and electric upgrades** required to meet net-zero emissions are infeasible
- The incremental cost of meeting net-zero emissions would create **financial distress**
- Infeasibility in a **low-income housing** building
- **No practicable** low or zero-emissions **alternative**

Leading with Equity

!! Coaching, Technical Support, Capital Investments !!

- **Low-income/low-rent housing and social services have extension** until 2036-2040 to meet targets
- **Multifamily has longer timeframe to transition to net-zero**, 2046-2050, vs. 2045-2045 for nonresidential
- In each five-year compliance interval, **compliance is phased with largest buildings first and the smallest last.**
- Prescriptive options for multifamily to **simplify compliance**
- **Low-income housing providers, public entities, and nonprofits may comply as an aggregated portfolio** which allows providers to focus efforts according to their own asset needs
- **Cooking end-use exemptions** (2031-2040) that recognize:
 - The **cost burden** of transitioning equipment in small business and BIPOC owned restaurants that are already struggling
 - **Cost, complexity, and tenant disruption** to upgrade electric capacity for individual multifamily units
- **Decarbonization Compliance Plan** option for: infeasibility in low-income housing, structural/electrical constraints, financial distress, landmark, etc.

Compliance flexibility

- **Alternative Compliance Payment** option 2031-2035.
- **360-day grace period** after compliance deadline before any fines are issued.
- Director has authority to **establish grace periods** for penalties, without need for a rule.
- **May reduce penalty** if no more than 20% above target.
- Director has authority to **mitigate fines**.

OSE Best Practices for All Owners

- Coaching & Technical Assistance Support Program
- Education, Outreach and Training
- Helpdesk
- Incentives
- History with benchmarking and tune-ups of >95% compliance, primarily due to extensive outreach and compliance support

Penalties, a last resort

For each five-year compliance interval:

a. Failure to report:

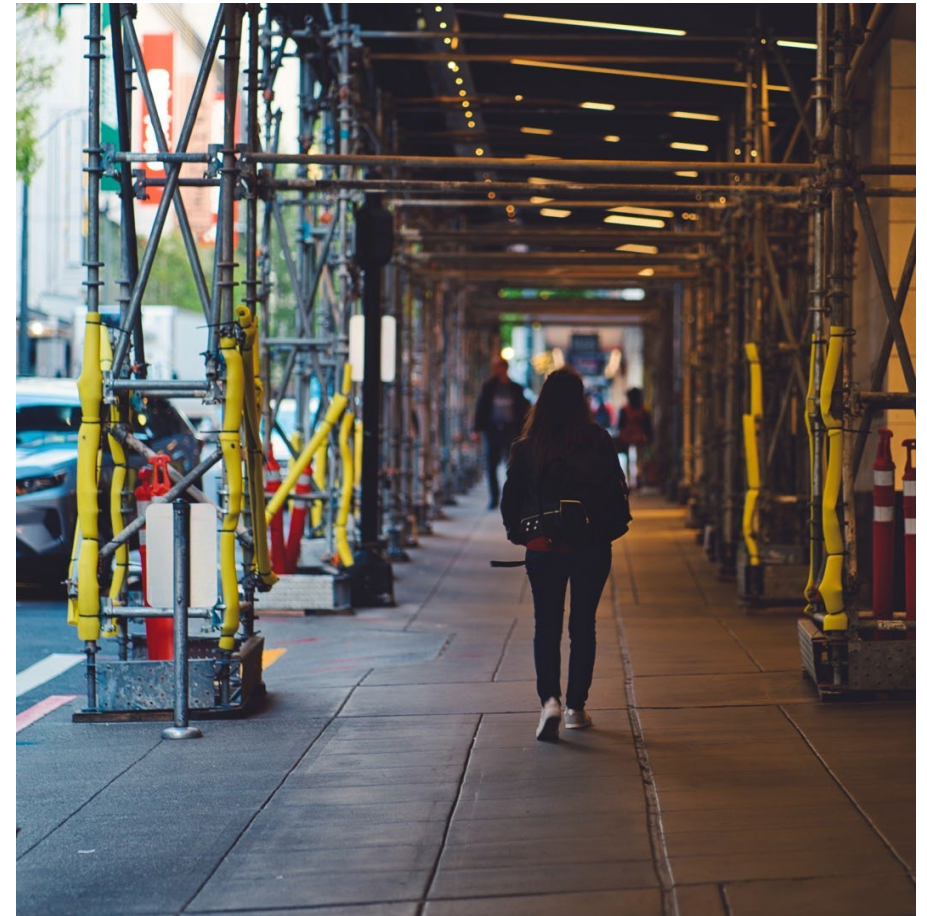
- i. \$15,000 for buildings over 50,000 square feet
- ii. \$7,500 for buildings over 20,000 square feet up to 50,000 square feet

b. Inaccurate reporting:

- i. \$15,000 for buildings over 50,000 square feet
- ii. \$7,500 for buildings over 20,000 square feet up to 50,000 square feet

c. Not achieving greenhouse gas intensity target:

- i. \$10.00/square feet for nonresidential buildings
- ii. \$7.50/square feet for multifamily buildings
- iii. \$2.50/square feet for low-income or low-rent multifamily housing






Why Now

Both of these are true

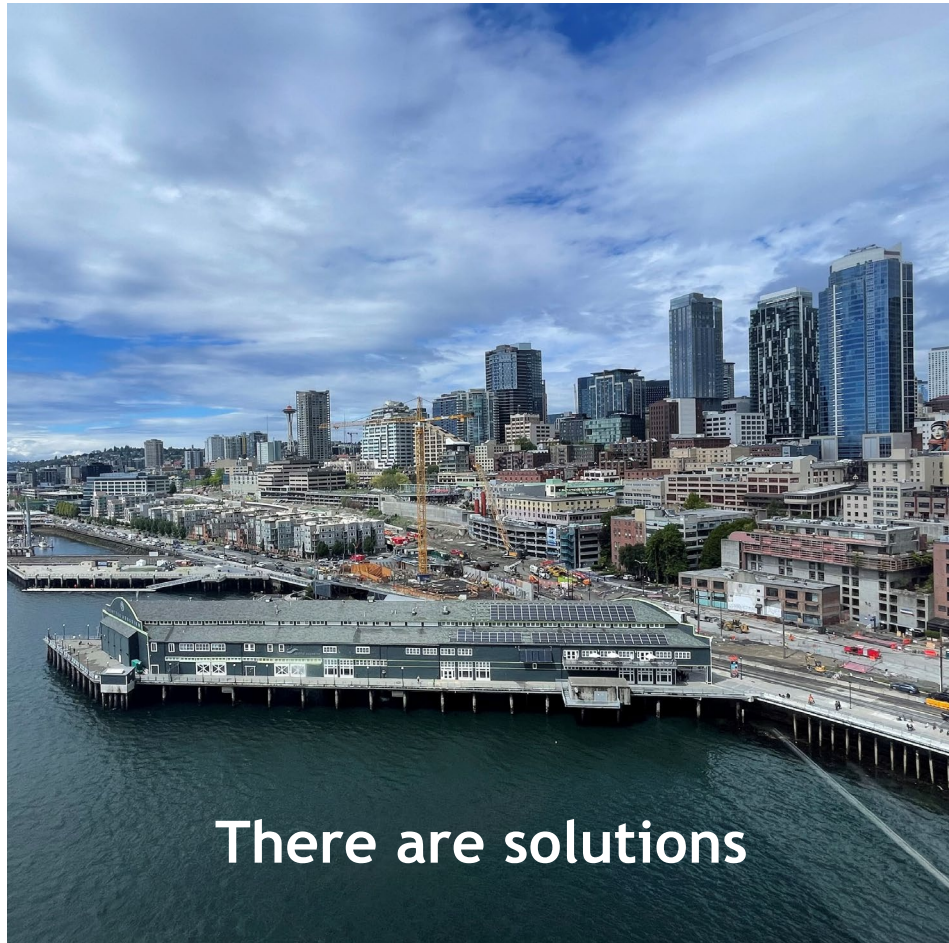


We are in a Climate Crisis



Transforming our buildings will require
a focused and sustained effort

We can take action now



There are solutions



**The technology is available;
Seattle has the expertise**

Hydronic pumps for supply & return chilled and heating water.
Credit: WA DES

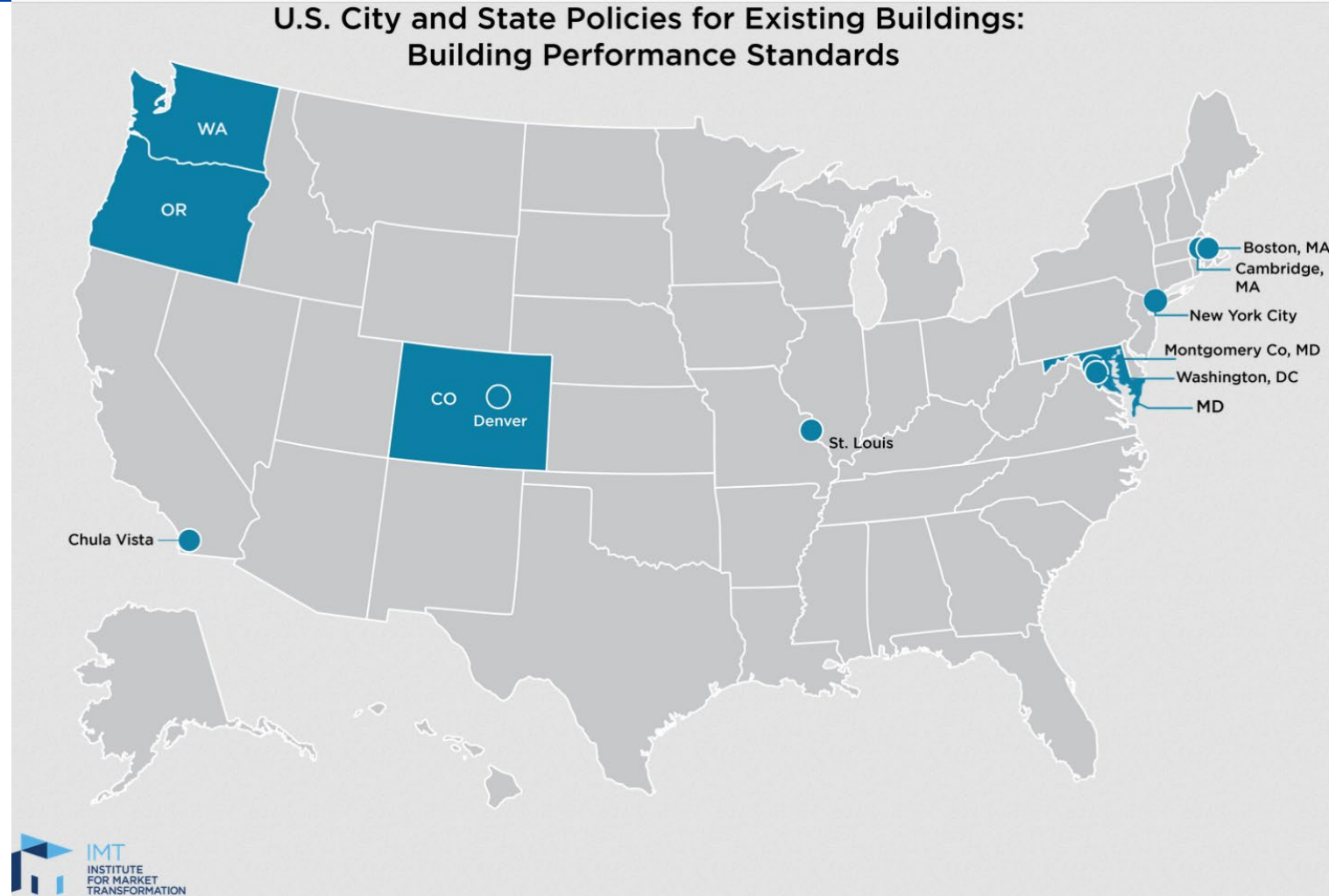
Seattle is aligned with action nationwide

White House National Building Performance Coalition 33 state & local governments

“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, January 2022

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



Seattle building emissions performance standard will create jobs

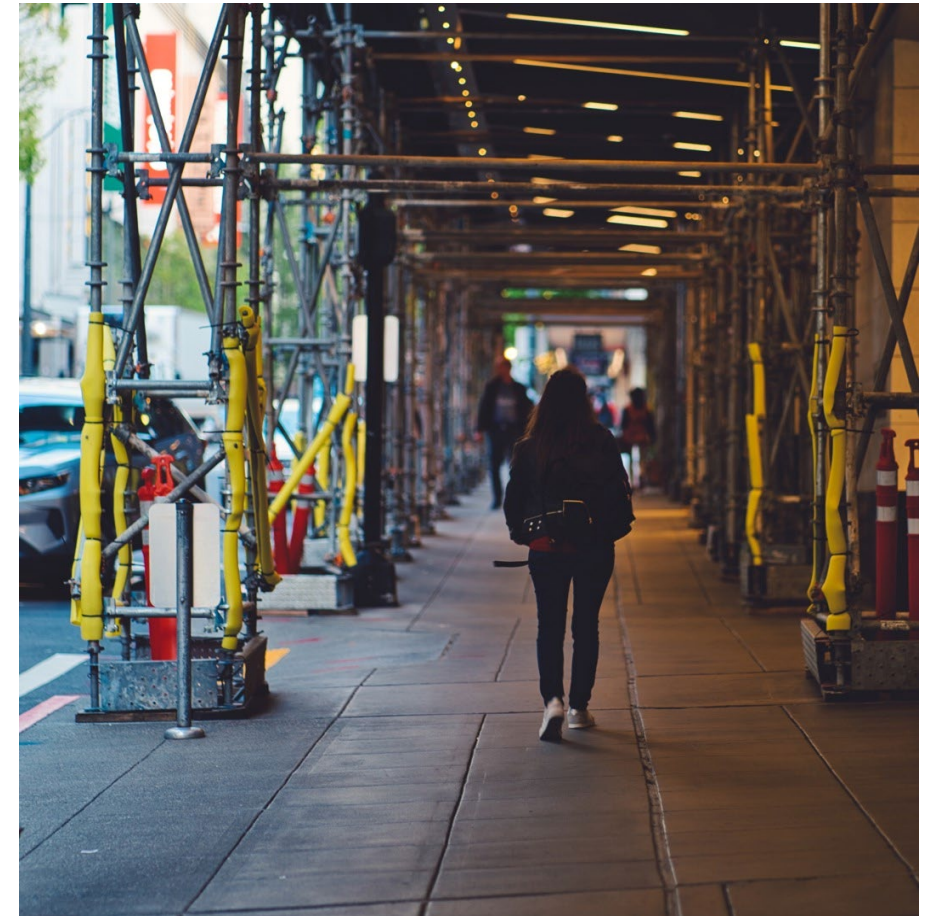
- **Well-paying clean energy jobs** at all levels
- Reduced demand over time for gas-oriented jobs
- Local high-quality jobs that will **directly benefit Seattle-area workers**
- Sending the market signal now allows the labor workforce to **grow, diversify and transition**
- Expand **career paths for women & BIPOC** and **opportunities for WMBE's**
- The City is **investing \$1 million/year** in clean energy career pathway training
- University of Washington establishing one of 10 national hands-on job training centers for clean energy careers, with City as a partner



Building improvements take time

Buildings >220,000 square feet:

- **Goals established**
 - 2023 BEPS adoption
 - Rulemaking 2024 - 2025
- **Verify and plan (by October 2027)**
 - Analyze current performance
 - Document existing systems
 - Identify pathway to meeting targets
- **Building improvements (by mid-2030)**
 - Engineering design
 - Secure funding / financing / incentives
 - Construction
- **Measure performance (12 months)**
- **Report compliance (October 2031)**



Support: OSE launching programs, growing them, and securing more funding

Support for all owners and tenants:

- Helpdesk
- Education and training
- Technical support
- Case studies & fact sheets

Seattle Clean Buildings Accelerator

Coaching, education & resources and financial support for building owners and managers, with most funding **prioritized toward non-profits and those serving frontline communities** to:

- Meet WA State Clean Buildings energy mandate
- Plan for emissions reductions under BEPS
- Identify utility and other incentives
- **\$4.5M** beginning 2024 for financial support

Engineering & Capital Investments

- ✓ **Approx. \$600K 2024 for engineering analysis and design** (City and DOE EECGB)
- ✓ **Awarded \$2.3M** in Dept. of Energy funding for decarbonizing low-income housing
- ✓ **Green New Deal 2022 Opportunity Fund: \$2M** to decarbonize low-income housing
- ✓ Pursuing federal infrastructure funds, inflation reduction act funds, State and other funding opportunities

Seattle Clean Building Accelerator Participants

- To date, 32 organizations in light coaching
- More than half representing Frontline communities, nonprofits, class B/C buildings



The next coaching session starts January 30, 2024.

Email cleanbuildings@seattle.gov to get on the list for program updates.

Questions?

seattle.gov/building-performance-standards

cleanbuildings@seattle.gov



Seattle
Office of Sustainability
& Environment