

Seattle's Building Emissions Performance Standard (BEPS) Rulemaking

Flexibility & Equity Provisions for Low- Income Multifamily Housing

March 18, 2025



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Welcome & Introductions



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Welcome!

- Icebreaker (in chat)
 - Name, role, organization
 - What's your favorite building in Seattle and why?



OSE and Consultant Team for Rulemaking



Rules of Engagement

- **Mutual respect** - All working group participants and facilitators are respectful of each other. Members will value each other's time, listen when people are speaking, and speak kindly to each other.
- **Open-mindedness** - Members are open to new ideas and perspectives, and do not disregard ideas they disagree with.
- **Equity** - All members are treated fairly, both by the facilitation team and by one another. Efforts are made to eliminate any real or perceived barriers to participation.
- **Be present** - You reserved the time to be here. Avoid outside distractions as much as possible but take care of your personal needs.
- **Accountability for Accuracy** - When sharing data and information make sure it is accurate and be prepared to provide a credible reference.
- **Chatham House Rule** - Participants are free to use the information received in meetings but should not identify the speaker or their affiliation.

Agenda

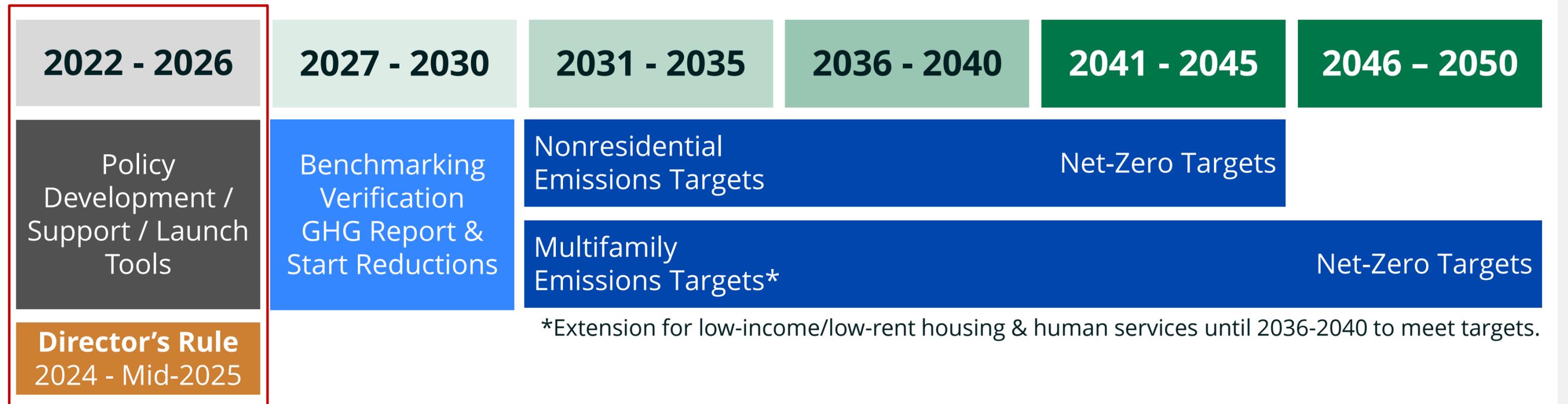
- **Welcome + Introductions** (5 minutes)
 - Consent to record
- **Introduction to BEPS Rulemaking Process** (10 minutes)
- **Flexibility Pathways for Low Income Multifamily Buildings** (40 minutes)
 - Path A: Portfolio Compliance
 - Path B: Extensions
 - Path B: Multifamily Prescriptive Path
 - Path C: Custom Decarbonization Plans
- **Breakout Groups: Decarbonization Plan Eligibility Criteria** (15 minutes)
- **GHGI Target Setting: Normalization Factors** (10 minutes)
- **Wrap-up & Next Steps** (5 minutes)

Introduction to the BEPS Rulemaking Process



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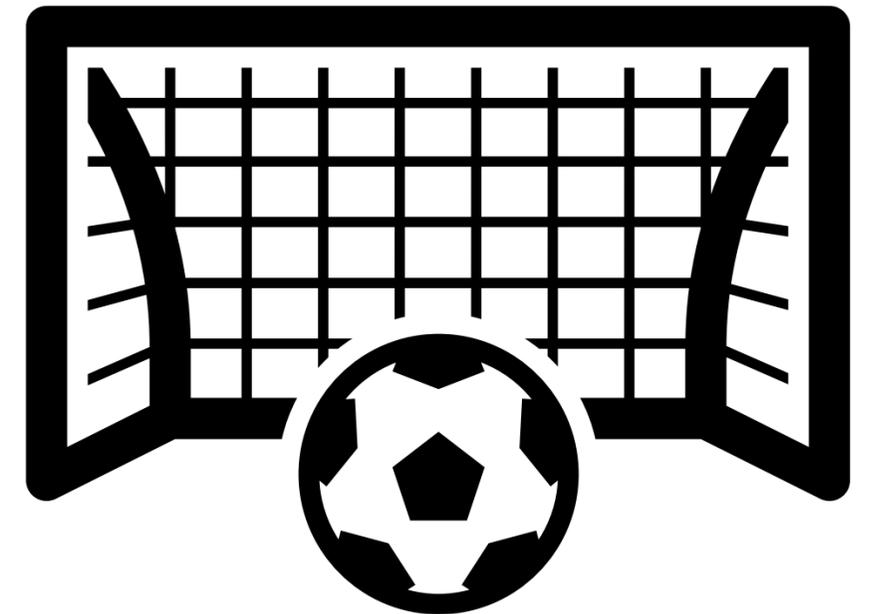
Next steps for 2024 -2025: Director's Rule or "Rulemaking" process



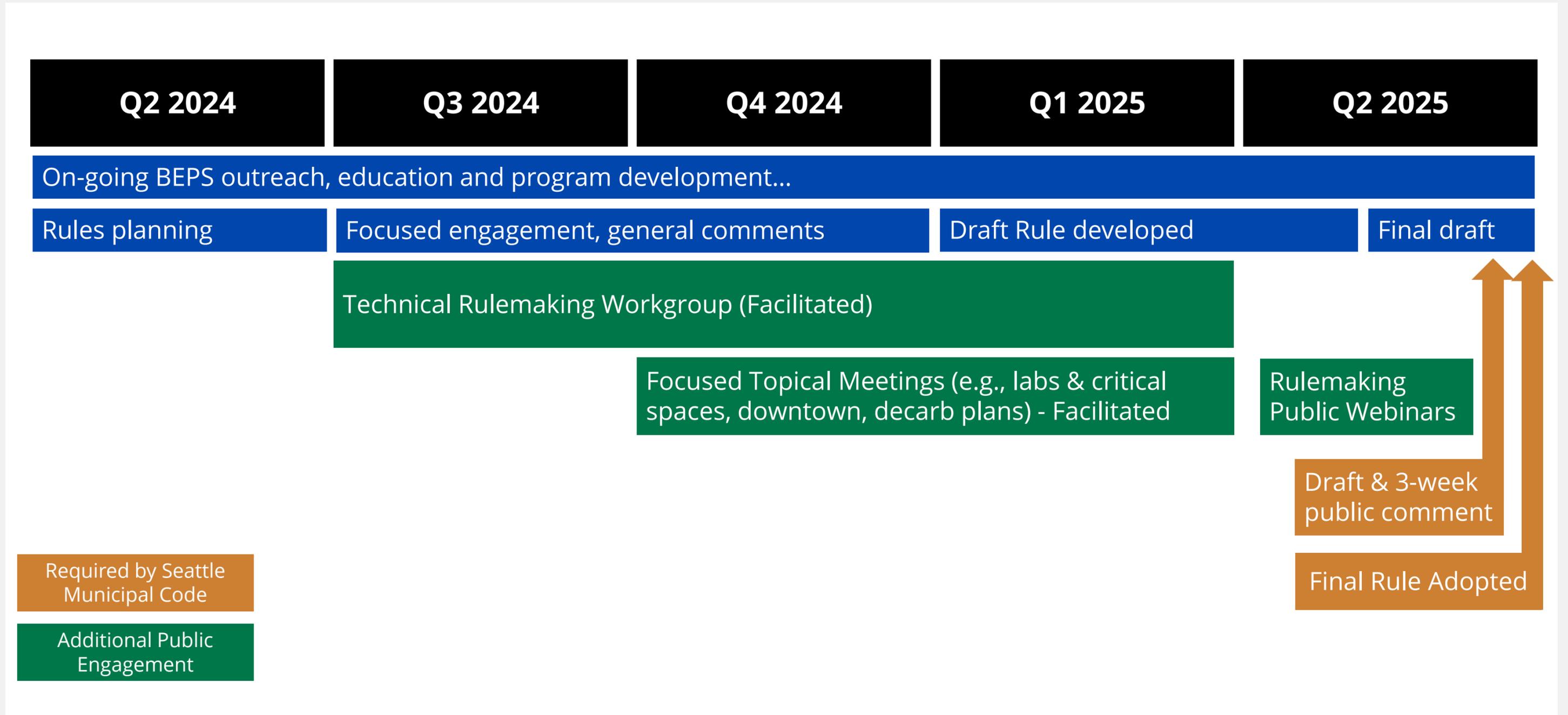
Rulemaking Goals for OSE

Per Seattle Municipal Code a Director's Rule is the required next step to clarify ordinance elements (e.g., timeline for exemptions requests, documentation required.)

- ✓ Engaged key stakeholders who have an opportunity to constructively contribute
- ✓ A rule that maintains the stringency of BEPS and explains how to use the flexibility
- ✓ A readable, approachable final Director's Rule document



Director's Rule Timeline Overview



2025 is the Foundational Rule - Updates to come!

Rulemaking Dates Listed in the Adopted Ordinance	By Dec 31st *By Oct 1st
1st Director's Rule Required (The Big Lift needed to launch program!)	Q2 2025
2031-35 Emissions Factors, Raise ACP cost for 2031-35, Final 2031-35 Laboratory GHGIT	2027
2036-40 GHGITS; Emissions Factors 2036-40	2031
Revised Penalty Amounts 2036-40	2034*
2041-45 GHGITS; Emissions Factors 2041-45	2036
Revised Penalty Amounts 2041-45	2039*
2046-50 GHGITS; Emissions Factors 2046-50	2041
Revised Penalty Amounts 2046-50	2044*

What does BEPS require of building owners?

Every five years:

-  **Energy Benchmarking Verification:** Verify previous year's building energy use and emissions. *By 2027-2030*
-  **GHG Report:** Document current GHGI/GHGIT and equipment, and plan actions to achieve targets. *By 2027-2030*
-  **Meet Greenhouse Gas Intensity Targets (GHGIT).** *By 2031-2035*
-  **Achieve** net-zero emissions with narrow exceptions. *By 2041-2050 (depending on building type and size)*

Existing **Building Tune-Ups** requirements will sunset after the 2023-2026 compliance cycle is done.

Technical Support & Funding!

- **Grants** - Up to \$4.5M for engineering design and/or implementation! Affordable housing and nonprofits are prioritized. **Application opening soon!**
- **Multifamily group training** for BEPS and CBPS compliance starts April 29.
- **Contact Amy Fowler** - amy.fowler@seattle.gov

Reminder: 40% of future revenue from payments or penalties will be prioritized towards buildings serving people with low or no incomes and communities harmed by racial or climate injustice.



LIHI's Denny Park and SHA's Jefferson Terrace and Lake City Court were among the funded buildings in 2024.

Clarifying Questions?



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Flexibility Pathways for Low-Income Housing



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BEPS low-income housing definition

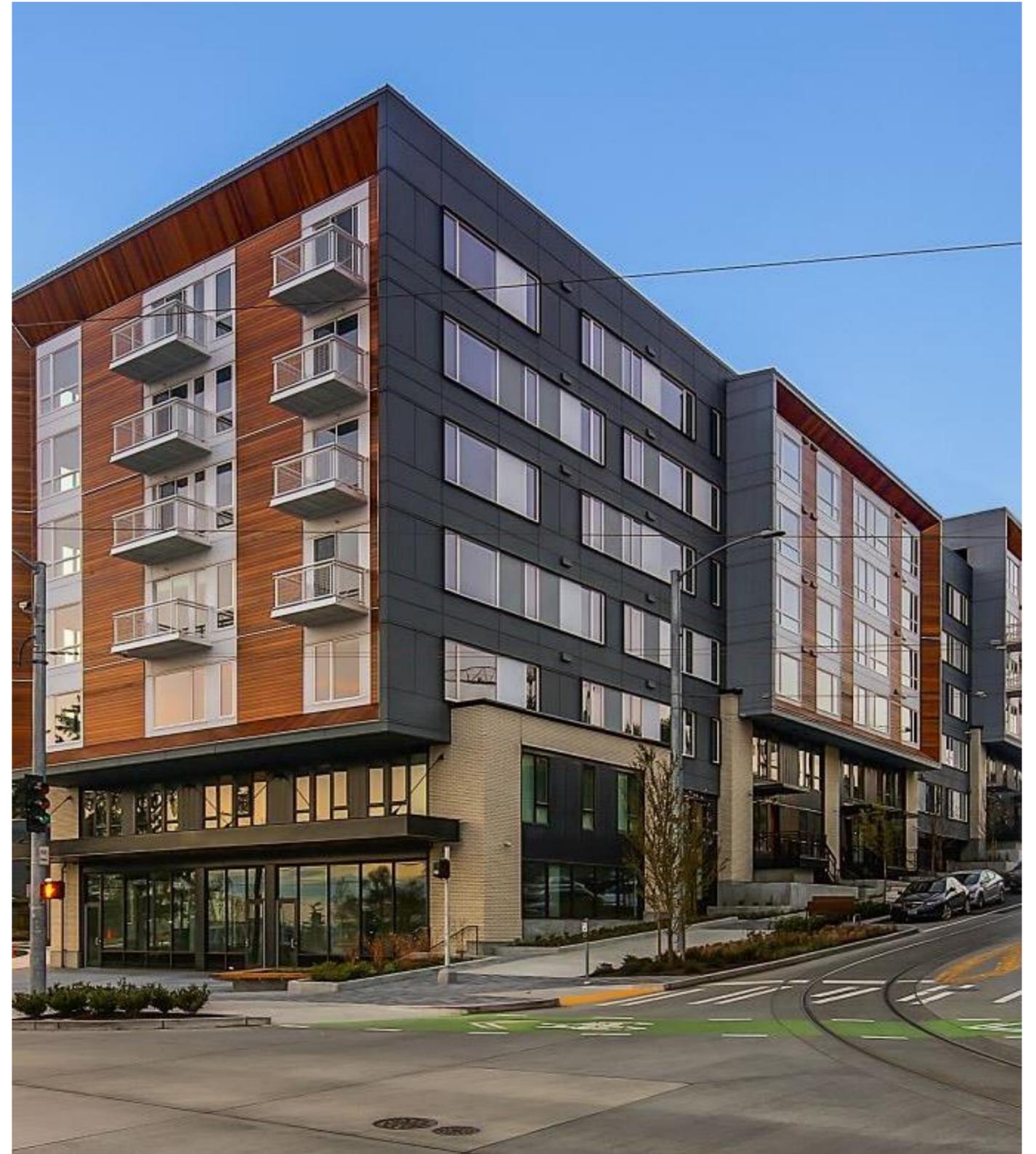
BEPS refers to "housing, low-income" as defined in SMC 23.84A.016:

A structure or structures for which... enforceable by The City of Seattle, King County, State of Washington, Washington State Housing Finance Commission, or other public agency if approved by the Director of Housing, being executed and recorded on the title of the property that includes the low-income housing and such legal instruments either:

1. For a minimum period of 40 years, **require rental of at least 40 percent of the dwelling units, small efficiency dwelling units, or congregate residence sleeping rooms as restricted units with rent and income limits no higher than 60 percent of median income;** or
2. For a minimum period of 50 years, **require at least 40 percent of the dwelling units as restricted units sold to buyers with incomes no higher than 80 percent of median income** at prices (initial sale and resale) to allow modest growth in homeowner equity while maintaining long-term affordability for income-eligible buyers, all as determined by the Director of Housing.

BEPS low-rent housing definition

(SMC 22.925.100) “A multifamily building with the **current contract rent and the contract rent for a minimum of ten years after the relevant compliance date in 2031-2035**, including an allowance for basic utilities if not included in the contract rent, for over 60 percent of the total residential units is **at or below either: 60 percent of median income, or 40 percent of median income for SEDUs**. Median income is as published by the Seattle Office of Housing. “Low-rent housing” is not low-income housing.”



Flexibility for affordable multifamily housing

PATH A:
Meet standard or **building portfolio/** campus GHGI Targets at all five-year compliance intervals

- Compliance Includes:**
- Benchmarking Verification
 - GHG Report
 - Meet standard GHGI Targets
 - Achieve Net Zero by 2041-2050

Emissions Deductions:
Emergency generators, district steam, and fossil fuel cooking, in-unit condo equipment, process loads & more.*

Exemptions: Electric only buildings exempt from GHGI Targets and building demolition (all requirements.)

PATH B:
Comply with extension or basic alternate compliance.

Extensions:
Extended timeline for **low-income/rent housing to meet GHGI**, financial distress, new construction, high vacancy

- Alternate Compliance:**
- ACP payment in lieu of GHGIT 2031-2035
 - **Multifamily prescriptive paths**
 - **Alternate GHGI** (a custom percent reduction target)

PATH C:
Custom timeline or targets due to hardship or unique circumstances.

- Decarbonization Plans:**
- Net-Zero by 2050
 - Low-Emissions by 2050
- Require audit & cost analysis.
- Hardship Eligibility Criteria:**
Conflicts with historic status, sub-alt, or seismic upgrade, **infeasible for low-income multifamily** or structural/electric upgrades & more.

District Campus Decarbonization Plan:
For campuses with district energy

* Some deductions are time limited. Can be used for paths B & C.

Path A: Portfolio Compliance



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What the ordinance says...

(SMC 22.925.100) “Building owners with a **building portfolio, district campus, or connected buildings** may use an **aggregate standard GHGIT** for the covered buildings within the building portfolio, district campus, or connected buildings using the calculations in Section 22.925.080.”



Photo: For Rent



Building Portfolio

Per BEPS (SMC 22.925.020) "**Building portfolio**" means two or more covered buildings on one or more lots, all owned by the same public, private, or nonprofit entity. Building portfolios may include district campuses and/or connected buildings. For the purposes of this definition, a building management company does not constitute an owner.

The buildings comprising a Building Portfolio generally function independently of each other and have separate meters and no district systems. They are distinct and usually dispersed geographically, but under same ownership.

Example:

Seattle Public Schools would be eligible to comply as a building portfolio

The names on this map are not intended to reflect the official name of any school building. They are instead intended to ensure better public understanding based upon familiar reference, particularly in situations where program and school building names differ. This information has been compiled by SPS staff from a variety of sources and is subject to change without notice. SPS makes no representations or warranties, expressed or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. SPS shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited. MapFile: SPS_District_2023

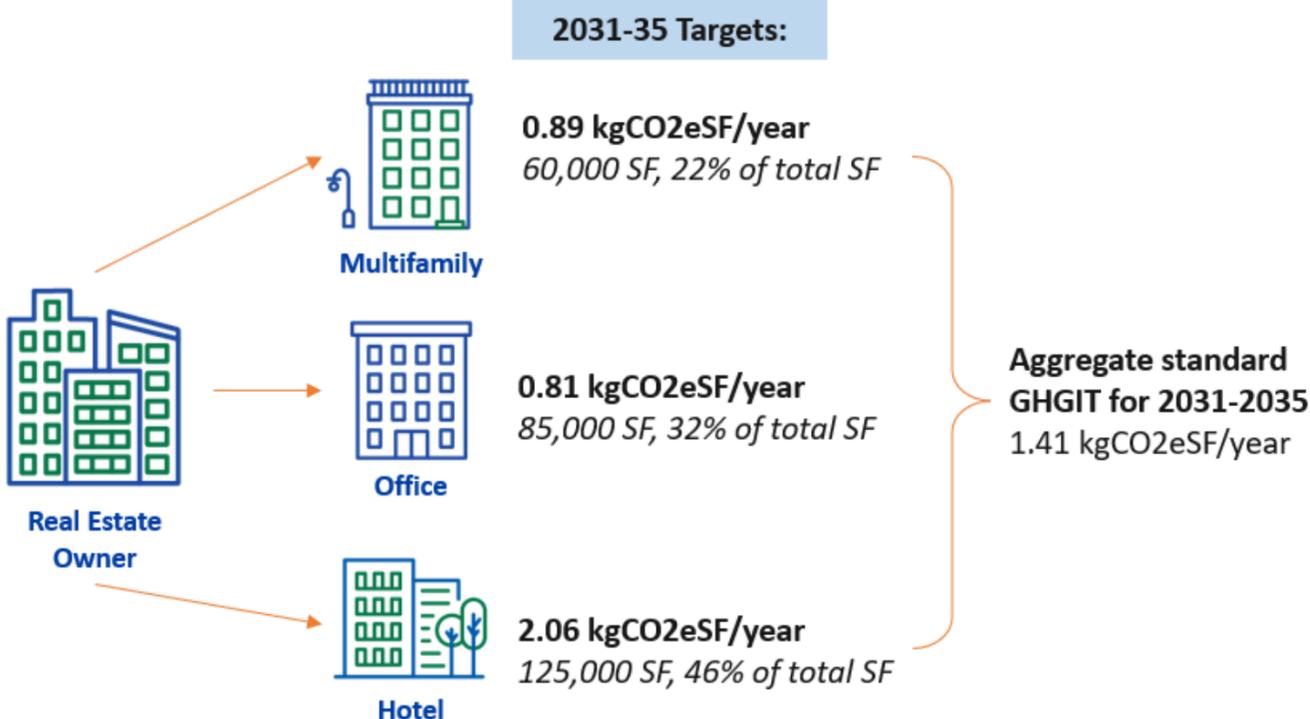
Benefits of reporting as a building portfolio

1. **Flexibility** → building owners can invest in buildings more in need or updates and/or buildings with equipment that is already scheduled for replacement
2. **Streamlined reporting process** → all buildings included in a building portfolio are required to comply mid-cycle (e.g., 2028, 2033, 2038, 2042 and so on).

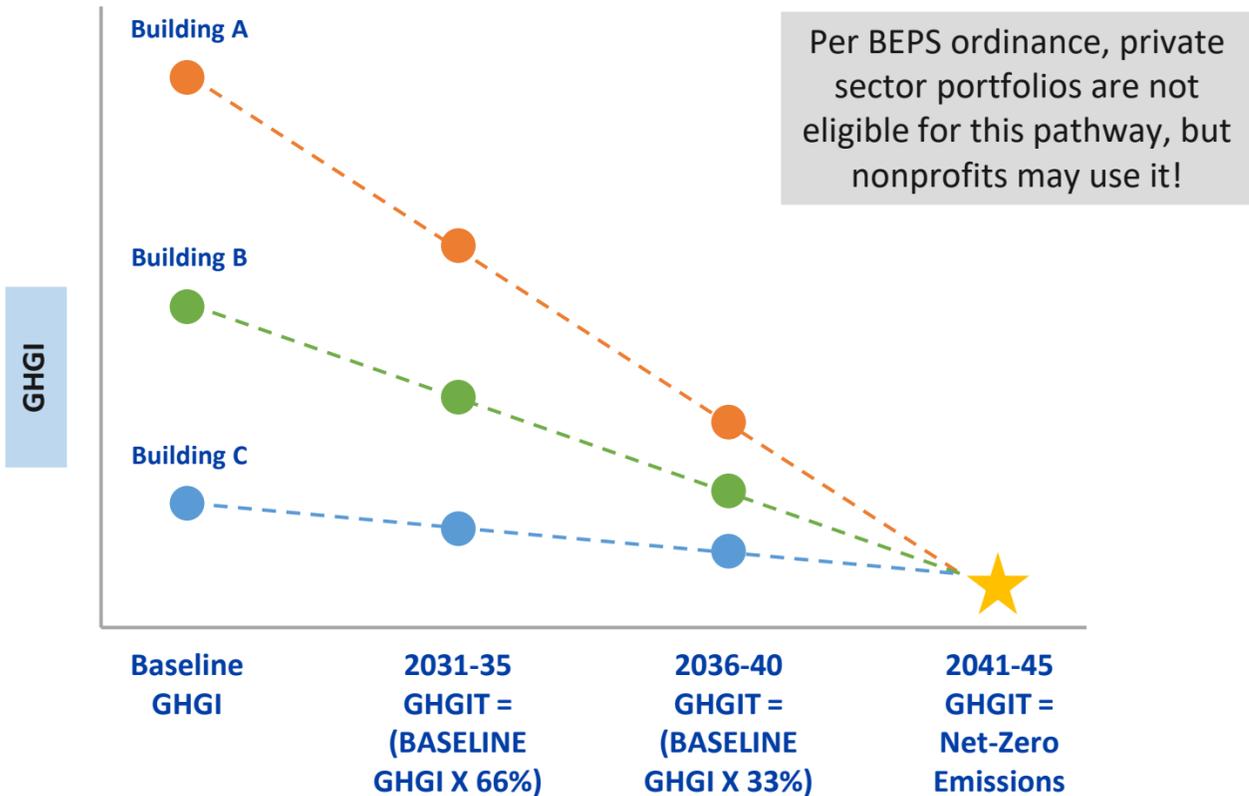


Two options for portfolio compliance

Aggregate GHGIT - GHGIT based on a pro-rated mix of standard building activity type targets for all their buildings' square footage.



Alternate GHGIT - State at baseline and set interim targets from that baseline to net-zero, with incremental targets reducing 33% (or 25% for multifamily) for each compliance interval.



Clarifying in rule – How can building owners document portfolio ownership?

To confirm eligibility for multi-building compliance, Building Owners must attest to one of the following and provide supporting documentation upon request:

1. All buildings have the **same owner as listed in the records of the King County Department of Assessments**
2. Building owner provides **copy of deed showing LLC is part of parent company or the title transfer** of the LLC to the parent company
3. **Corporate secretary for owner provides a signed certificate affirming** that they are the majority owner of a property
4. **Executive Director provides a signed certificate affirming** that all buildings are owned by the same charitable organization

For discussion: Any concerns that this documentation would be a barrier to any low-income housing entities?

Path B: Extensions



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What the BEPS ordinance says...

(SMC 22.925.110) “Building owners with covered buildings with one or more of the following conditions may **apply for an extension from meeting GHGIs, benchmarking verification, and/or reporting requirements** for one or more compliance intervals.”



Extensions included in BEPS

1. A **newly constructed** covered building
2. Covered buildings under **pre-existing financial distress**
3. A covered building with a **high rental vacancy** rate
4. **Low-income housing**
5. **Low-rent housing**
6. Covered buildings with more than 50 percent of the building occupied by **human service uses**
7. **Low-income housing with a pre-established refinancing date** after the 2036-2040 compliance deadline

Extension for **Low-Income Housing**

Extension Details in Ordinance

Low-income housing may receive an **extension from meeting the GHGIs in the 2031-2035 compliance interval**. Building owners must meet data verification and all reporting obligations for the 2031-2035 compliance interval and must **meet the GHGIs for all subsequent compliance intervals**.

Allowed Compliance Periods

2027-2030 ¹	2031-2035	2036-2040	2041-2045	2045-2050
NA	yes	no	no	no

¹Option applies to benchmarking verification and/or reporting requirements during 2027-2030.

Eligibility Criteria

Building owners must document that the building meets the following criteria:

1. Building **meets 'Housing, low-income' definition** in [SMC 23.84A.016](#) (land use code)

Proposal for rule:

If building can't be readily verified by OSE as low-income housing, via information provided by the Seattle Office of Housing, King County Assessor or other public data sources, OSE will require owner to provide documentation that the building meets the definition.

-- ZOOM POLL --

Extension for **Low-Rent Housing**

Extension Details in Ordinance

Low-rent housing may receive an extension from meeting the GHGITs in the 2031-2035 compliance interval. Building owners must meet benchmarking verification and all reporting obligations for the 2031-2035 compliance interval and must meet the GHGITs for all subsequent compliance intervals.

Allowed Compliance Periods

2027-2030 ¹	2031-2035	2036-2040	2041-2045	2045-2050
NA	yes	no	no	no

¹Option applies to benchmarking verification and/or reporting requirements during 2027-2030.

Eligibility Criteria

Building owners must document that the building meets the following criteria:

1. Building **meets “Housing, low-rent”** definition in SMC 22.925.100 (see slide 17).

Proposal for Rule:

Specify source: Use the published income for Rental Housing Limits for **“Rental properties with any other type of developer agreement”** for the compliance year or year prior.

Documentation: Share rent roll with City demonstrating rent meets thresholds.

-- ZOOM POLL --

Extension for Low Income Housing: Pre-established Refinancing Date Conflict

Extension Details in Ordinance

Low-income housing may receive an extension from meeting the GHGIs in the **2036-2040 compliance interval when a pre-established refinancing date** would not occur until after the covered building's compliance deadline in 2036-2040. Building owners must meet data verification and all reporting obligations for the 2036-2040 compliance interval and must meet the GHGIs for all subsequent compliance intervals.

Allowed Compliance Periods

2027-2030 ¹	2031-2035	2036-2040	2041-2045	2045-2050
NA	NA	yes	no	no

¹Option applies to benchmarking verification and/or reporting requirements during 2027-2030.

Eligibility Criteria

Building owners must document that the building meets the following criteria:

1. Building **meets 'Housing, low-income' definition** in [SMC 23.84A.016](#) (land use code)
3. A **pre-established refinancing date will not occur until after the covered building's compliance deadline in 2036-2040.**



Zoom Poll Input:
What can building owners provide to document the refinancing date?

Path B: Multifamily Prescriptive Path



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What is the multifamily prescriptive path?

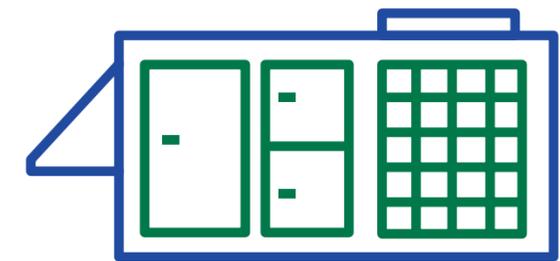
What the ordinance says...

(SMC 22.925.100) “A building owner **may utilize one or more prescriptive options for a multifamily building in lieu of meeting its GHGIT** during the 2031-2035, 2036-2040, or 2041-2045 compliance intervals. Each prescriptive option shall only be used for one compliance interval.” Prescriptive options include:

Replacing existing fossil fuel combustion service hot water system(s) with **electric heat pump water heating**



Replacing existing fossil fuel combustion HVAC heating system equipment with **electric heat pump systems**



Proposed application & reporting timeline for multifamily prescriptive path

Step 1: Notify OSE of intent to use **prescriptive path** as part of GHG Report (2027-2030)

- **Notify OSE of intent** to use prescriptive path when submitting first benchmarking verification and GHG report (

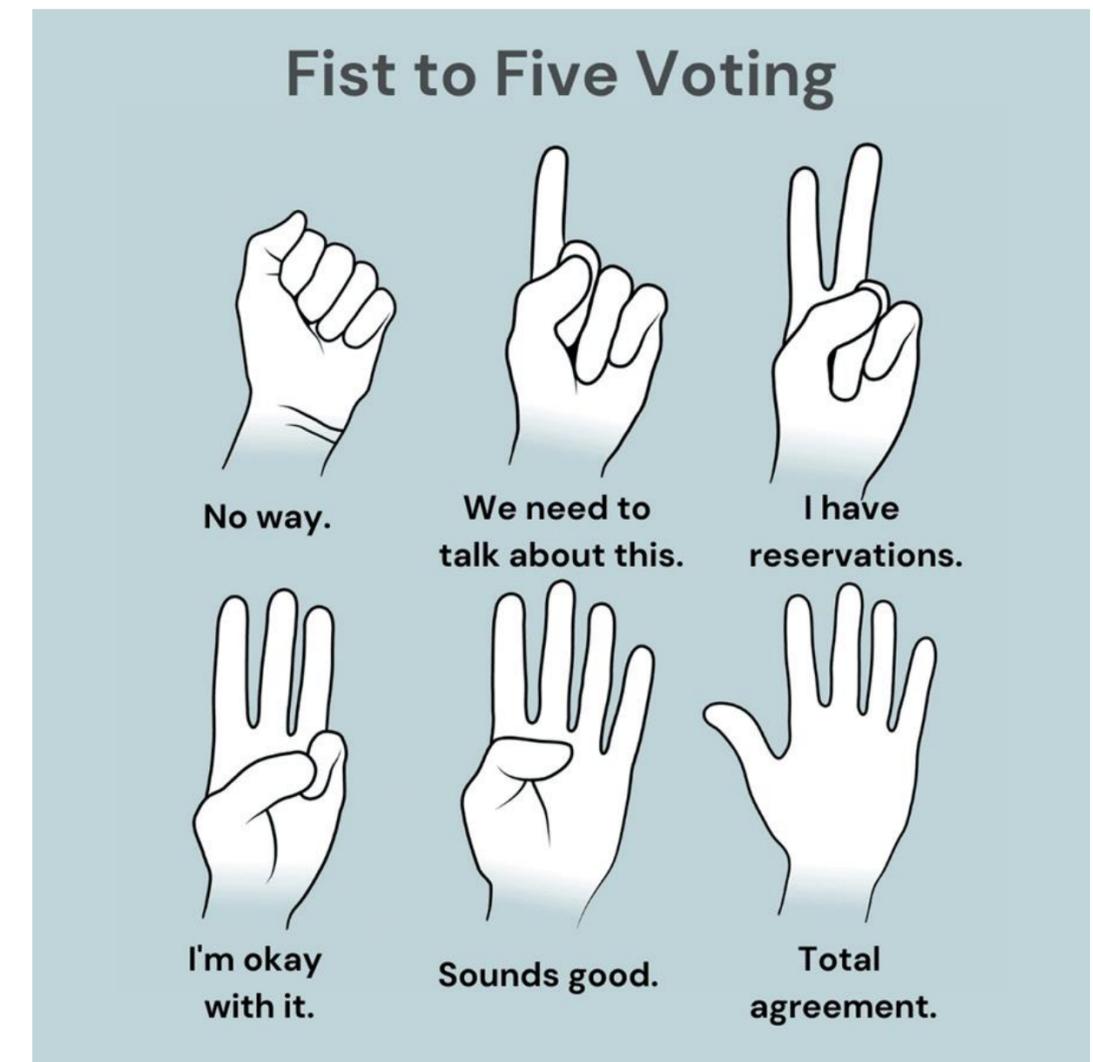
Step 2: Submit **GHG Report** documenting actions taken to achieve compliance (beginning in 2031)

- Since benchmarking data may not yet reflect emissions savings, **demonstrate documentation to show work is complete**

Rule proposal: Documentation that multifamily prescriptive work is complete

Suggestions from Technical Rulemaking Workgroup:

- Evidence that equipment was installed (completed work order, paid invoices, photos, etc.)
- Completed Seattle Dept of Construction & Inspections permit inspection



Path C: Custom Decarbonization Compliance Plans

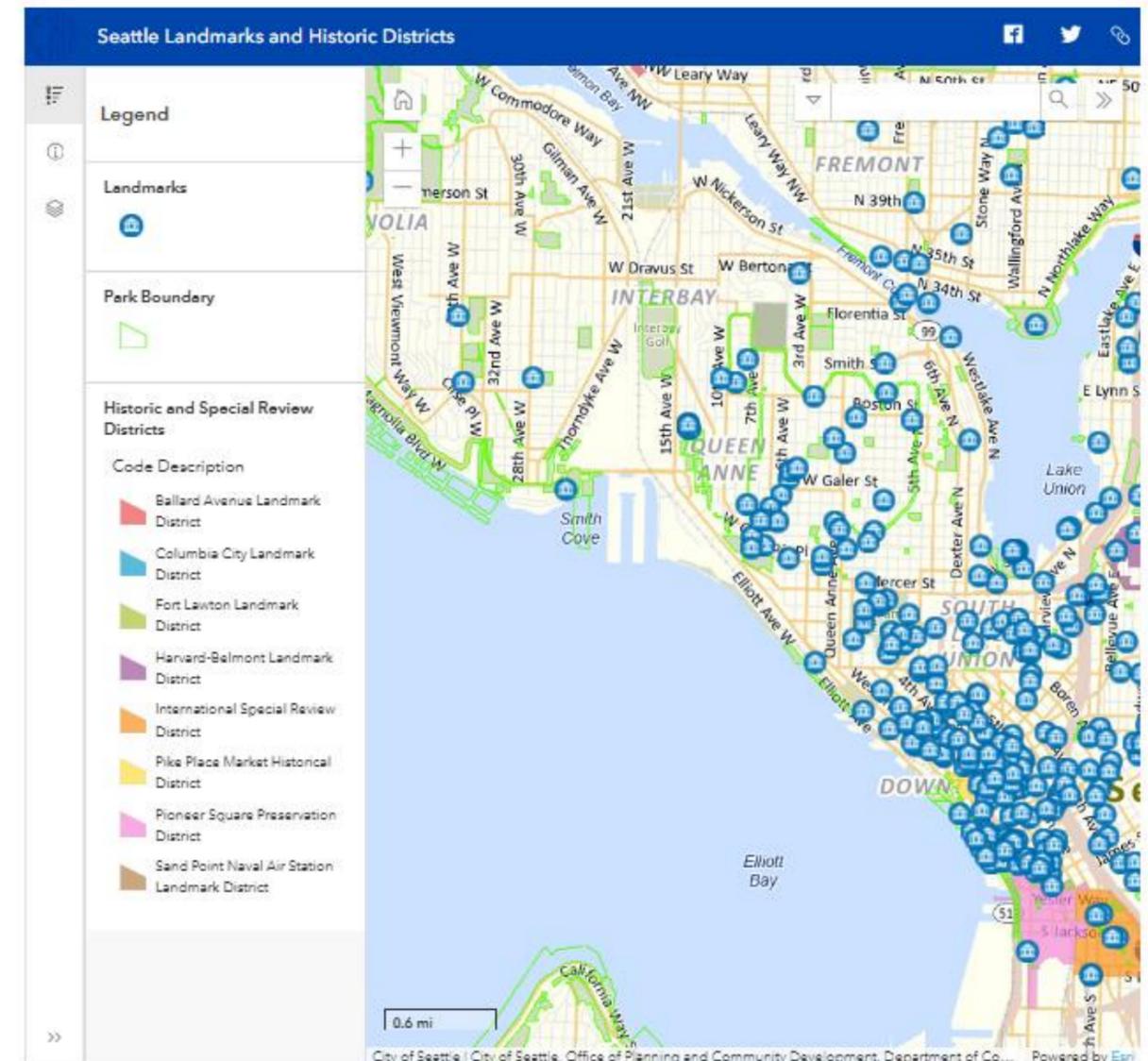


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What the BEPS ordinance says...

(SMC 22.925.100) “Building owners with **extenuating circumstances** that make complying with the compliance schedule or meeting the GHGIs a significant hardship for an individual building may apply to use a **decarbonization compliance plan** for achieving **net-zero greenhouse gas emissions** or an **approved low emissions GHGI** by 2041-2050.”

Landmarks Map



Source: <https://www.seattle.gov/neighborhoods/historic-preservation/city-landmarks/landmarks-map>

Decarbonization Compliance Plans

Enables nine additional years from 2041 to meet net-zero or low emissions for largest commercial buildings.

Customizable and flexible for individual buildings:

- Building owners with extenuating circumstances
- Meeting the compliance schedule or meeting the GHGIs is a significant hardship
- Requires demonstration of eligibility, application to use, and an energy & emissions audit.

Two plan options

- Net-Zero by 2050
- Low Emissions by 2050

What do we mean by low emissions?

“Low Emissions ” is not defined in BEPS ordinance.

Based on technical working group input, the Director’s Rule will:

- **Clarify timeline for achieving this target**
 - Buildings must meet specified low emissions threshold by 2050
 - Buildings are expected to meet interim custom targets in earlier compliance cycles
- **Align on a percentage as the “last mile” for emissions reductions (e.g., 90% reduction from baseline)**
 - Note potential exceptions to handle administratively
- **Validate percentage reduction against other definitions**
 - **Example:** Federal blueprint calls for reductions in building emissions 90% by 2050*

*<https://www.energy.gov/eere/decarbonizing-us-economy-2050-national-blueprint-buildings-sector>

Eligible Extenuating Circumstances

Eligible Extenuating Circumstances	Net-Zero	Low Emissions
Concurrent substantial alteration	✓	
Concurrent seismic upgrades	✓	
Significant electrical infrastructure upgrades	✓	
Access to equipment prohibited by lease in place by 1/13/24 or earlier	✓	
Replacement of equipment prior to end-of-life	✓	
Non-interruptible operations in laboratory or healthcare	✓	
No practicable low and/or zero GHG emissions alternatives on market	✓	✓
Historic landmark building		✓
Structural or electrical capacity upgrade barrier		✓
When upgrades necessary to meet net-zero emissions in a low-income housing multifamily building are infeasible.		✓
Analysis demonstrates meeting net-zero would create financial distress		✓

Defining “infeasibility in low-income multifamily”

Draft Rule Text

Building owners must verify that the building qualifies as “housing, low-income” per SMC 23.84A.016. The building owner must explain that the decarbonization measures to meet net-zero are infeasible because of situations such as:

- Impact of tenant relocation on a sensitive population
- Mechanical room space constraint to accommodate net-zero HVAC or DHW equipment that would serve all residents.



Breakout Session

Discuss in two groups:

1. Defining “low emissions”
 - What are the barriers to setting the threshold at 90%?
2. Defining “infeasibility in low-income multifamily”

-- 15 minutes for discussion --

GHGI Target Setting: Normalization Factors



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What is a normalization factor?

(SMC 22.925.100) "Normalization factor" means a **numerical factor used to adjust the GHGIT** of a building activity type to account for hours of operation for nonresidential activity types, or occupancy density for multifamily activity types.

Based on energy use (EUI) findings:

- Nonresidential buildings open longer than average typically use more energy. (WA Clean Buildings law – EUI target normalization)
- Multifamily buildings with smaller units than average typically use more energy because of more people living in the building (more cooking, showers, etc.).

Calculating Emissions (GHGI) Target

GHGIT is pro-rated by building activity types:

Activity Types	Space GFA (SF)	Percent of GFA (SF)	Building Activity GHGIT	Normalization Factor	Pro-rated GHGIT
Multifamily	70,000	87.5%	.89	TBD in Rule	.83
Outpatient Clinic (Other)	10,000	12.5%	2.48	TBD in Rule	.31
Total GFA	80,000			GHGIT (2031-25)	1.09

PATHS A & B Most Buildings Will Meet Standard GHGI Targets (GHGIT)

Building Activity Type	2031 - 2035	2036 - 2040 ¹	2041 - 2045 ^{1,2}	2046 - 2050 ^{1,3}	Building Activity Type	2031 - 2035	2036 - 2040 ¹	2041 - 2045 ^{1,2}	2046 - 2050 ^{1,3}
College/University	2.69	1.57	0	0	Other	2.48	1.45	0	0
Entertainment/Public Assembly	1.18	0.69	0	0	Recreation	3.22	1.88	0	0
Fire/Police Station	2.23	1.30	0	0	Refrigerated Warehouse	0.98	0.57	0	0
Hospital	4.68	2.73	0	0	Residence Hall/Dormitory	1.16	0.68	0	0
Hotel	2.06	1.20	0	0	Restaurant	5.73	3.34	0	0
K-12 School	0.95	0.56	0	0	Retail Store	1.03	0.60	0	0
Laboratory	6.30	3.68	0	0	Self-Storage Facility	0.31	0.18	0	0
Multifamily Housing	0.89	0.63	0.37	0	Senior Living Community	2.11	1.23	0	0
Non-Refrigerated Warehouse	0.77	0.45	0	0	Services	1.36	0.79	0	0
Office	0.81	0.47	0	0	Supermarket/Grocery Store	3.42	2.00	0	0
					Worship Facility	1.20	0.70	0	0

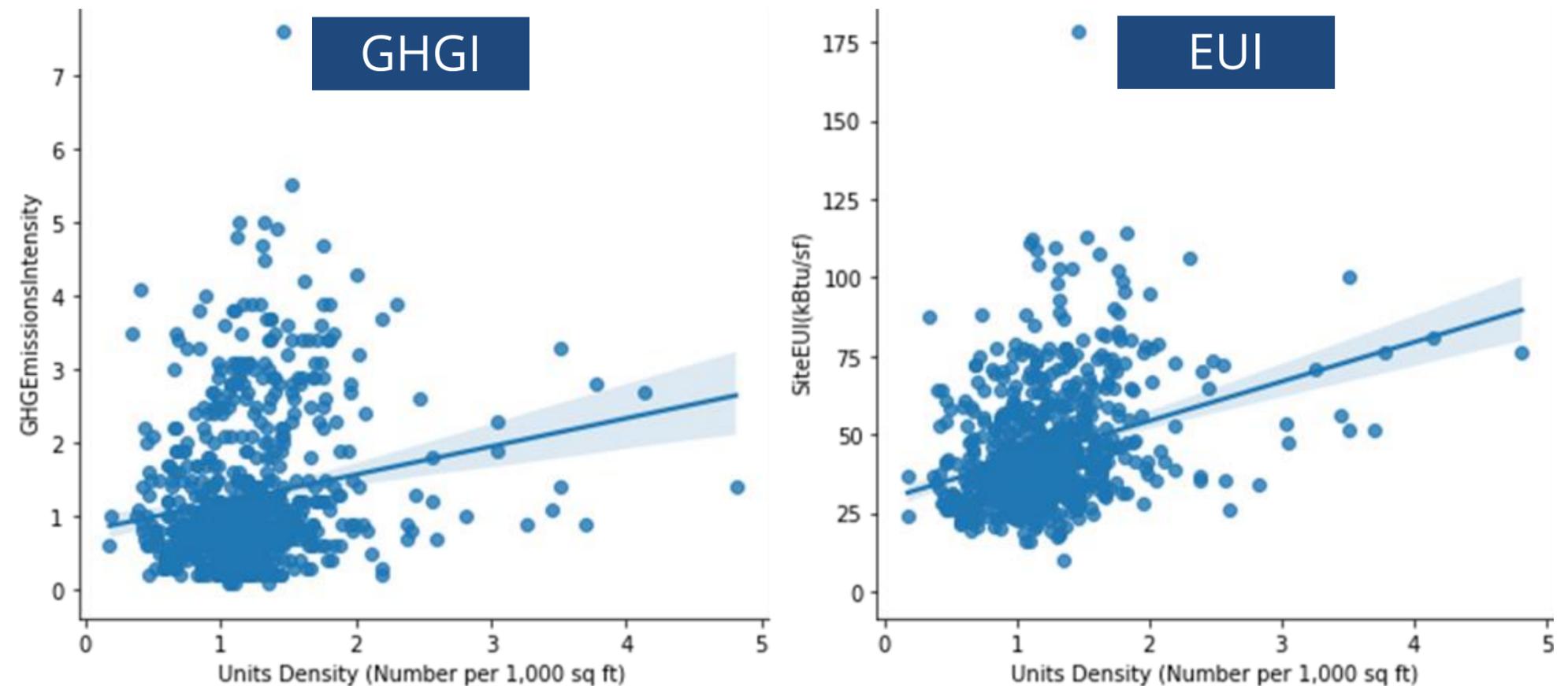
1 – Targets may be revised by future rule, per subsection 925.070.A.
 2 – Net-zero emissions by 2041-2045 for nonresidential.
 3 – Net-zero emissions by 2046-2050 for multifamily housing.
 4 – Pursuant to Section 22.925.110, owners of low-income housing, human service use, and low-rent housing may receive an extension from meeting the GHGITs in 2031-2035 but still must meet benchmarking verification and all other reporting obligations for 2031-2035.

Research on multifamily normalization factors on emissions (GHGI) inconclusive

- Pacific Northwest National Laboratory (PNNL) and SBW data analyses:
- PNNL could not find reliable factor for occupancy density (units/1000 ft²).
 - Results showed buildings with gas that are subsidized low-income housing have a higher GHGI than non-subsidized
- SBW identified differences between low, mid, and high-rise buildings
 - GHGI for mid-rise buildings is lower than low- and high-rise buildings

Multifamily: Emissions (GHGI) and energy (EUI) have weak to moderate correlations

- **Unit density and GHGI** correlation is 0.18 (Weak)
- **Site EUI and unit density** correlation is 0.32 (Weak to Moderate)



These figures compare the relationship between unit density in multifamily buildings and GHGI (left) or EUI (right). The shading represents the error bar.

Rule Proposal: Multifamily normalization factors for GHGI targets

Rule Proposal

- Do not adopt a multifamily factor in Rule now.
- OSE may revisit after verified energy benchmarking data is available. *Updated Rule required by ordinance to finalize targets for 2036 and later by 12/31/31.*

Rationale

- Technical Workgroup consensus to not adopt nonresidential normalization factor. No consensus about multifamily factor.
- MF normalization factor research is inconclusive - doesn't justify adding this as another flexibility measure.
 - PNNL and SBW did not find strong correlations.
 - No other BPS jurisdictions use normalization factors.
- Normalization factor does not change net-zero goal.
 - Only makes incremental targets less stringent (higher) for some buildings and more stringent (lower) for others.

Open Discussion



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Conclusion

- We will share a meeting summary to ensure notes are accurate
- Please complete this [short survey](#) to give your feedback
- Questions or comments? Email cleanbuildings@seattle.gov

THANK YOU!



APPENDIX



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Path B: Extensions



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Extension for Human Service Uses

Extension Details in Ordinance

Covered buildings with more than **50 percent of the building occupied by human service uses** may receive an **extension from meeting the GHGIs in the 2031-2035** compliance interval. Building owners must meet data verification and all reporting obligations for the 2031-2035 compliance interval and must meet the GHGIs for all subsequent compliance intervals.

Allowed Compliance Periods

2027-2030 ¹	2031-2035	2036-2040	2041-2045	2045-2050
NA	yes	no	no	no

¹Option applies to benchmarking verification and/or reporting requirements during 2027-2030.

Eligibility Criteria

1. Building **meets “Human service use” definition [23.84A.016](#)**.
2. **Rule Proposal:** Benchmarking Verification must confirm that **more than 50 percent of the building’s GFA is used to provide one or more of the following:**
 - Emergency food, medical, or shelter services;
 - Community health care clinics, including those that provide mental health care;
 - Alcohol or drug abuse services;
 - Information and referral services for dependent care, housing, emergency services, transportation assistance, employment, or education;
 - Consumer and credit counseling;
 - Day care services for adults

Path B: Multifamily Prescriptive Path



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Benefits of multifamily prescriptive path

1. **Equitable:** Allows multifamily buildings to comply in a way that does not need energy modeling to determine if projects emissions savings would meet the GHGIT.
2. **Flexible:** Compliance could be achieved in a shorter time span because equipment installation can occur in the year before the compliance deadline.
3. **Straightforward:** Reduces some complexity for owners with separate HVAC and DHW systems.



Photo: UW Integrated Design Lab

End Use Deductions



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What are end use deductions?

What the ordinance says...

(SMC 22.925.120) “Building owners may **deduct the sum of the annual GHG emissions from the following end uses** from their compliance GHGI, for one or more compliance intervals.”

Annual GHG emissions from¹:

1. **Fossil fuel cooking equipment**
2. Fossil fuel high intensity **process equipment** used in hospitals and laboratories
3. Fossil fuel high intensity **laundry equipment** used in hotels and healthcare
4. Fossil fuel equipment located within an **individually owned residential unit** within a multifamily condominium building
5. **Fossil fuel generators used exclusively for emergency back-up power**
6. Fossil-fuel equipment used for back-up **emergency heat** in hospitals and laboratories
7. **District energy steam**, hot water and/or chilled water provided by a private district energy provider
8. **Electric vehicle charging equipment**
9. Electric loads related to broadcast antennas, on-site cell phone towers or other **communications equipment** that is unrelated to the primary purpose of the building

Decarbonization Plans



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What do we mean by net-zero?

(SMC 22.925.100) “**Net-zero emissions**” means that **all energy sources used by a covered building have zero GHG emissions**, including any carbon offsets purchased and retired by a natural gas utility or district thermal energy provider in accordance with and as authorized under the Climate Commitment Act, chapter 70A.65 RCW; and including any renewable energy credits purchased and retired by an electric utility in accordance with and as authorized under the Clean Energy Transformation Act, chapter 19.405 RCW; and **except for certain emissions deductions** as may be allowed by rule under Section 22.925.120.



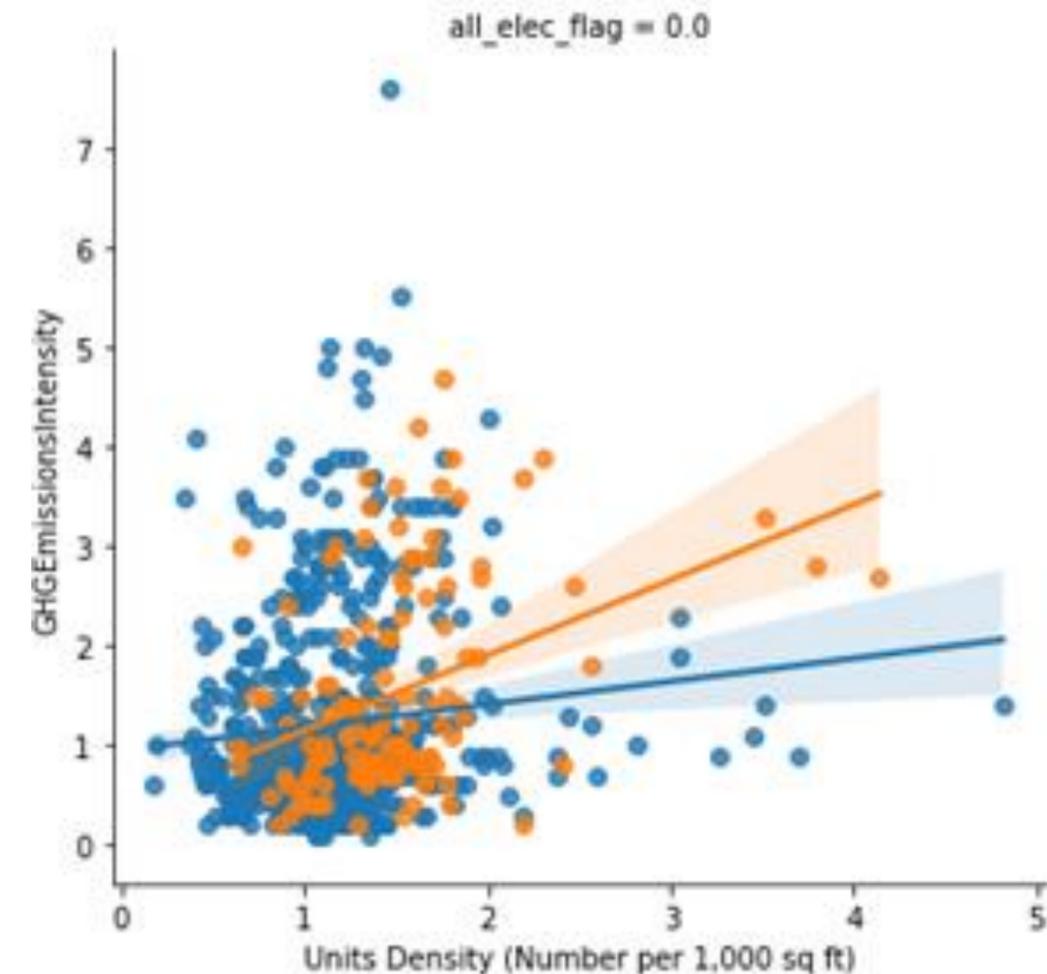
GHGI Target Setting: Normalization Factors



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Research on multifamily normalization factors is inconclusive

- Pacific Northwest National Laboratory (PNNL) analyzed benchmarking data to understand the influence of various building features that could impact GHGI
- PNNL's results may support an increase in the building performance target for subsidized, low-income housing compared to the current target established for all multifamily buildings
- However, they could not identify a reliable factor for an adjustment based on unit density that worked across all multifamily buildings



The analysis indicates mixed fuel (mostly electric & gas) buildings that are **subsidized (in orange)** have a higher GHGI than non-subsidized **(in blue)**

SBW also investigated variations in low-, mid-, and high-rise buildings

- SBW identified differences in mean GHGI between low, mid, and high-rise buildings
- Possible explanations for why mid-rise GHGI is lower:
 - High rises include more luxury buildings with high gas loads (e.g., stoves, pools, fireplaces), central HVAC systems, and conveyance
 - Low rises tend to be older buildings and less energy efficient; mid rises tend to be newer and more efficient

