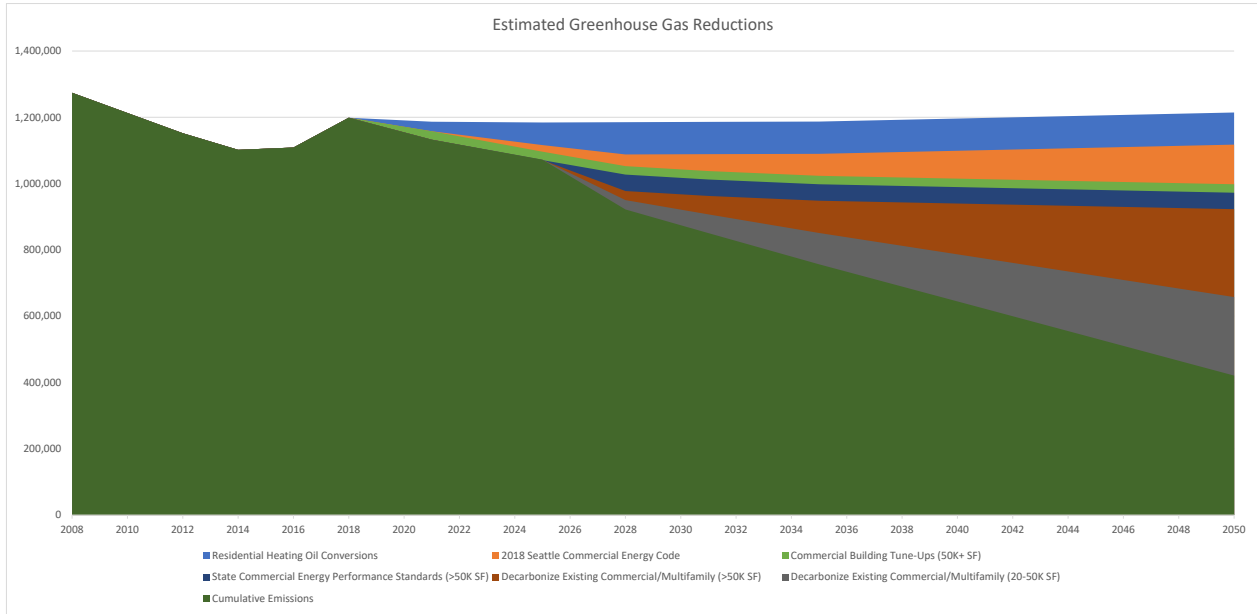


	2008	2012	2014	2016	2018	2021	2025	2028	2031	2035	2050	% reduction - 08 to 50	Incremental %
Business as Usual	1274000	1,152,000	1,102,000	1,109,000	1,199,000	1,186,982	1,184,316	1,185,291	1,186,265	1,187,240	1,214,617	4.7%	4.7%
Residential Heating Oil Conversions	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,157,831	1,116,297	1,088,121	1,089,096	1,090,071	1,117,448	8.0%	8.0%
2018 Seattle Commercial Energy Code	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,157,831	1,096,443	1,052,653	1,038,014	1,023,375	997,973	17.8%	9.8%
Commercial Building Tune-Ups (50K+ SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,071,014	1,027,224	1,012,585	997,946	972,545	19.9%	2.1%
State Commercial Energy Performance Standards (>50K SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,071,014	977,536	962,897	948,258	922,856	24.0%	4.1%
Decarbonize Existing Commercial/Multifamily (>50K SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,072,421	950,444	907,305	851,062	657,519	45.9%	21.8%
Decarbonize Existing Commercial/Multifamily (20-50K SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,072,421	943,291	892,999	827,218	597,910	50.8%	4.9%
Decarbonize Existing Commercial/Multifamily (0 - 10K SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,072,421	931,216	868,850	786,970	497,289	59.1%	8.3%
Decarbonize Existing Commercial/Multifamily (10 - 20K SF)	1,274,000	1,152,000	1,102,000	1,109,000	1,199,000	1,132,402	1,072,421	922,060	850,537	756,449	420,986	65.3%	6.3%
Cumulative Emissions													





ENERGY • WATER • EFFICIENCY

# Seattle BEPS Target Analysis

May 30, 2023

## Objective

A Fall 2021 Executive Order called for the City of Seattle to develop new carbon-based Building Performance Standards or a Building Emissions Performance Standard (BEPS) among other initiatives to address the climate crisis. This call was subsequently adopted by incoming Mayor Harrell in 2022 who then directed the Office of Sustainability and Environment (OSE) to develop carbon-based building performance standards for existing nonresidential commercial and multifamily buildings 20,000 sq. ft. or larger.

OSE contracted with SBW Consulting to develop draft emissions targets that will transition the Seattle stock of buildings 20,000 square feet or larger to net-zero carbon emissions by 2050 and analyze the impacts of those targets. The metric greenhouse gas intensity or GHGI (kgCO<sub>2</sub>e/sq ft/yr) was selected by OSE for the targets, and then confirmed by Seattle's Building Performance Standards Technical Advisory Group.

## Develop Targets

The SBW team used the following approach to develop the proposed GHGI targets or GHGITs.

- Starting with the 2019 energy benchmarking data, we grouped the benchmarked Seattle buildings into categories (“building type”) that align with OSE benchmarking reporting and Washington State Clean Building Performance Standards (CBPS) compliance reporting, have similar energy use intensity (EUI) characteristics, and have sufficient number of buildings in each building type to support using the mean GHGI of the group as the basis for the greenhouse gas intensity target or GHGIT.
  - Next, we converted 2019 energy use to GHG emissions for each building for each energy source (electricity, fossil gas, and steam) and calculated floor-area-weighted building type mean GHGI as sum of GHG emissions divided by sum of gross floor area for each building type.
  - Finally, we set the mean GHGI as the baseline starting point and interpolated to zero in the ending year for each building type, setting the target for each compliance interval as the point where the line crosses each 5 year increment from the starting year.
  - SBW then ran a draft targets scenario (discussed at the October 2022 draft targets webinar) for OSE to use in legislation drafts and to obtain stakeholder input on.
-

- This first scenario used the 2019 baseline mean projected out to a starting year of 2023 for nonresidential building types and ending year of 2045. For Multifamily, the 2019 baseline mean starting year was 2028 and the ending year was 2050.
- Based on substantial stakeholder feedback to OSE that nonresidential emissions targets starting in 2026-2030 were infeasible to comply with given both the timing and current state of the market, OSE then directed SBW to run other target scenarios and selected the following:
  - For all Nonresidential building types, the starting year is 2028 (using 2019 building type baseline means projected out) and the ending year is 2045 (three 5-year increments with GHGIT compliance starting in 2031-35 and ending in 2041-45). For Multifamily, the starting year is 2028 (using 2019 building type baseline means projected out) and the ending year is 2050 (four 5-year increments with GHGIT compliance starting in 2031-35 and ending in 2045-50).<sup>1</sup>
- The building type level GHGI targets are mapped to the ENERGY STAR Portfolio Manager property types.

Additional details are provided below.

## Data sources

- OSE benchmarking data which includes energy use by fuel, building type, space use types, and gross floor area for each benchmarked building (Seattle buildings 20,000 SF and larger)
- Emissions factors
  - Electric: Seattle City Light
  - Fossil Gas: Environmental Protection Agency (EPA)<sup>2</sup>
  - Steam: CenTrio

## Assumptions

We used the 2019 benchmarking year as the source for baseline emissions. See next section for discussion of why 2020 and 2021 benchmarking data were not used. Benchmarking data from 2022 and later were not yet available.

## Review of 2020 and 2021 Data

As part of SBW's first draft targets analysis, we looked at energy use and emissions characteristics

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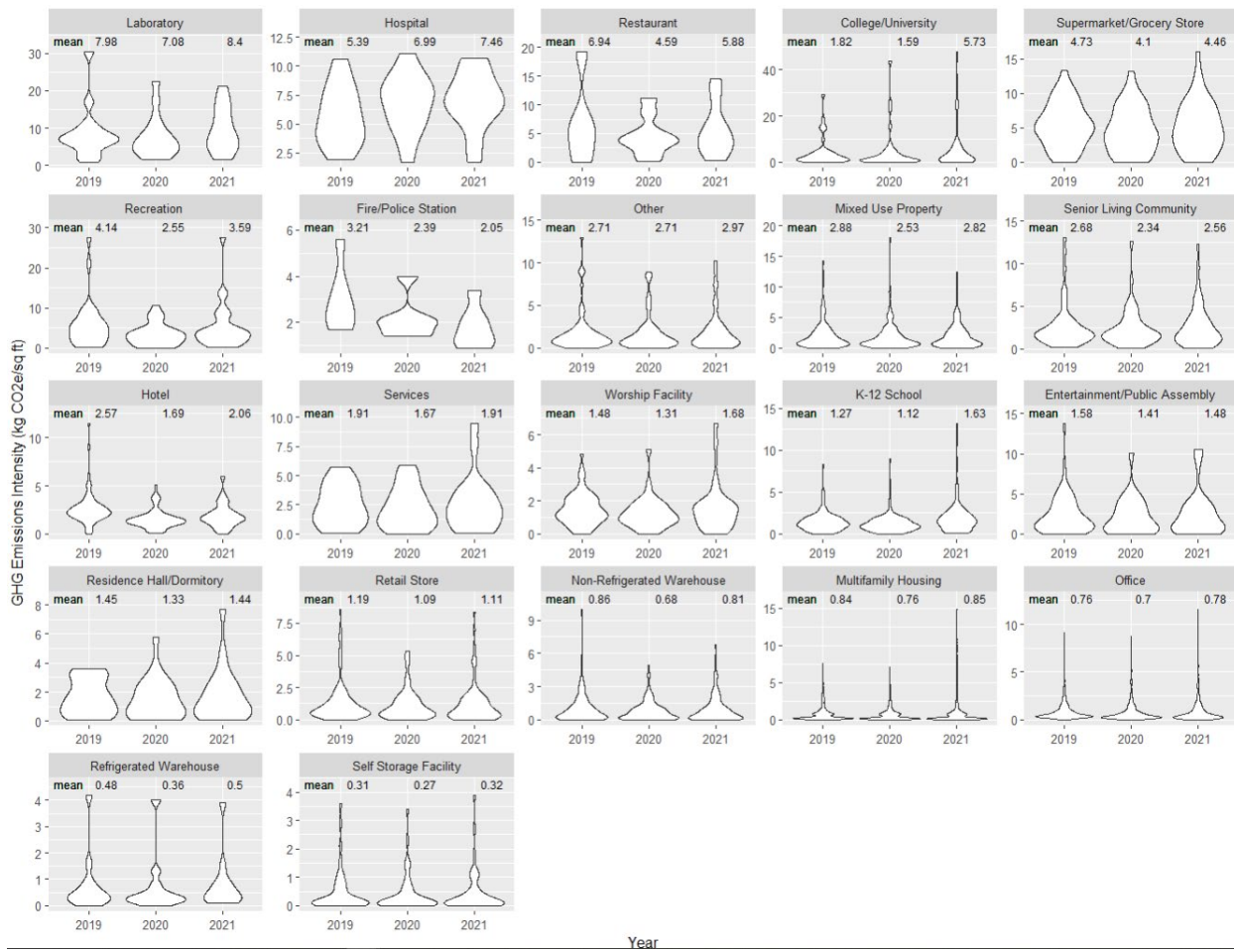
<sup>1</sup> SBW also ran several other target scenario variations that extended the targets timing and provided the results in a memo to OSE.

<sup>2</sup> From EPA Center for Corporate Climate Leadership GHG Emission Factors Hub. Follow this link to access the GHG Emission Factors Hub workbook, <https://www.epa.gov/sites/default/files/2020-04/ghg-emission-factors-hub.xlsx>

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from 2020 and 2021 years. OSE, based on stakeholder feedback and market knowledge, ultimately decided the pandemic and other disruptions caused those years not to be reliable starting points for developing the targets. Specifically, we looked at building types with significant annual differences, particularly large increases in GHGI in 2020 and 2021 compared to 2019 and considered whether those increases were likely to continue or if emissions were more likely to return to be more similar to 2019 levels. The figure below shows the distribution of GHG emissions intensities by year for each building type – wider areas in the shapes indicate more buildings have GHG emissions intensities in that range. We observed the following:

- Hospital GHGIs continued upward trend in emissions through 2021
  - Fire/Police Stations continued downward trend
  - College/University rebounded much higher but this may be due to a change in reporting, e.g., starting to report steam, etc in 2021
  - Schools, Worship Facilities rebounded higher, likely due to increased ventilation; Labs have also rebounded higher
  - Hotels, Restaurants, Recreation, Grocery rebounding but still less than 2019
  - Office, MF, other building types of interest remain about the same
-



**Figure 1: Distribution of GHG emissions intensities by year for each building type.**

## Establish GHGI Targets

We removed all-electric buildings (those with no reported gas or steam use) from the 2019 population then calculated the weighted average emissions for each building type.<sup>3</sup> With 2019 emissions as a proxy for 2028 emissions, we used 2028 as the starting year for developing the GHGI targets. From the building type average emissions in 2028, we interpolated to zero emissions in the ending year – 2045 for Nonresidential buildings, 2050 for Multifamily buildings. Figure 2 depicts the interpolation to generate the targets with a dot indicating each building type and compliance period GHGI target from the midyear of the compliance cycle. The legend also shows the count of buildings contributing to the development of the GHGIT for each building type, e.g., “A-Laboratory, N=14” means there are 14 laboratory buildings.

<sup>3</sup> All-electric buildings were removed because certain building types, like multifamily and non-refrigerated warehouse had a disproportionate number of all-electric buildings that, when included in the targets calculations, significantly drove down the average GHGI for these types relative to other building types like offices where most buildings have a mix of gas and electric.

Greenhouse Gas Intensity Targets (GHGIT)

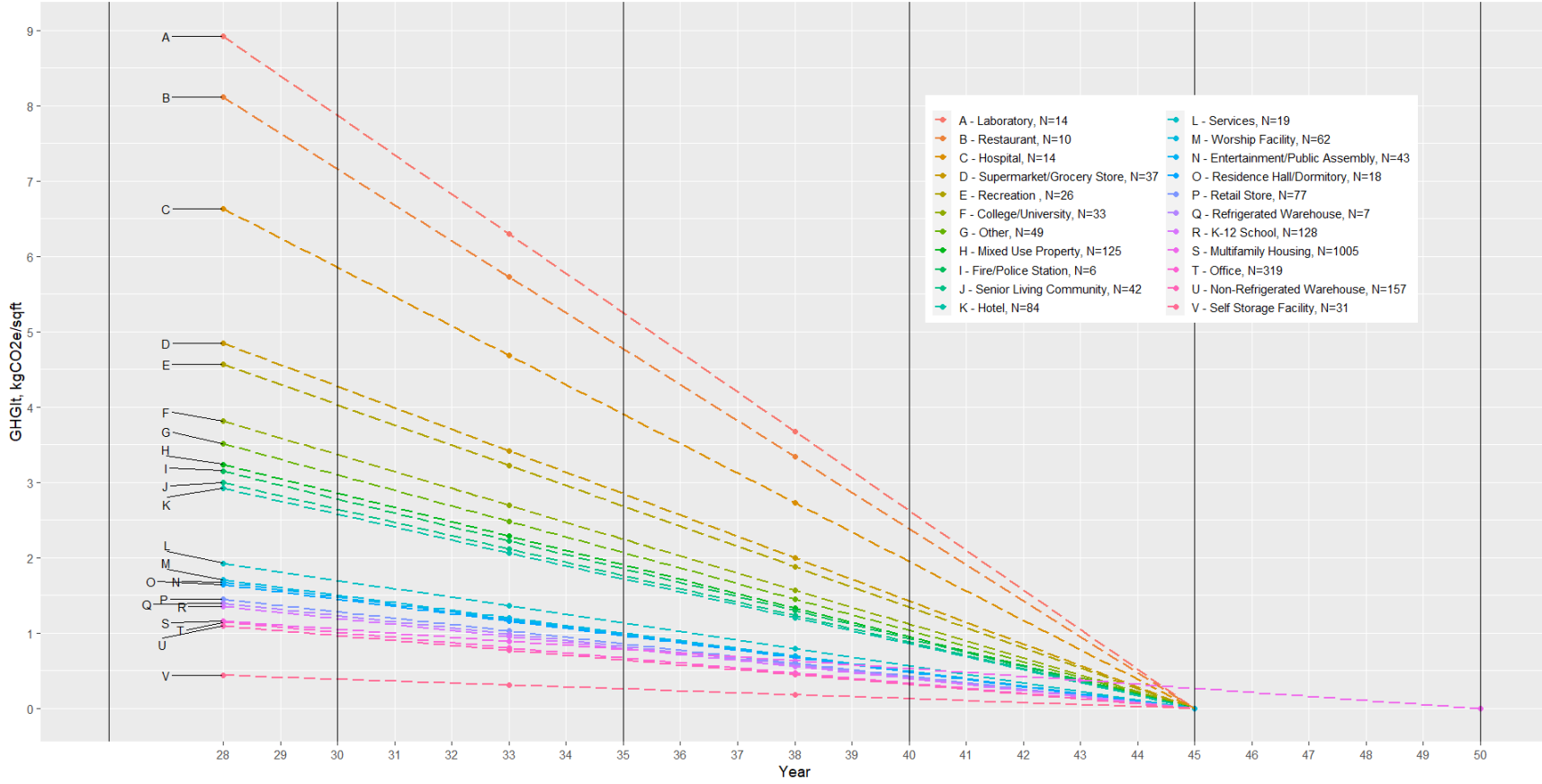


Figure 2 GHGI Target Development

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## Proposed GHGI targets

Table 1 shows the proposed GHGITs for each building type in each compliance period. Note that a single GHGIT for each building type for each compliance interval is assigned based on the midyear of the compliance interval (e.g., 2033 for 2031-2035, 2038 for 2036-2040, etc.). The year that any building must comply with the BEPS is based on its gross floor area (e.g., over 220,000 SF first compliance year is 2031, 90,000-220,000 SF first compliance year is 2032, and so forth). This table also shows how Portfolio Manager Types are mapped to the Building Types with GHGI targets. A companion workbook, “GHGI Targets Portfolio manager and CBPS.xlsx”, assigns the GHGIT for each Portfolio Manager type, which varies in level of granularity for different building types.

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**Table 1 Proposed GHGI Targets (kg CO2e/sq ft/year)**

Building Activity Types	Portfolio Manager Building / Space Types Included	2019 Baseline Average	2031 - 2035	2036 - 2040	2041 - 2045 <sup>1</sup>	2046 - 2050 <sup>1</sup>
College/University	College/University	3.81	2.69	1.57	0	0
Entertainment/Public Assembly	Pre-school/Daycare, Convention Center, Movie Theater, Museum, Performing Arts, Social/Meeting Hall, Indoor Arena, Race Track, Stadium (Closed), Stadium (Open), Other - Stadium, Aquarium, Casino, Zoo, Other - Entertainment/Public Assembly, Transportation Terminal/Station, Lifestyle Center	1.67	1.18	0.69	0	0
Fire/Police Station	Fire Station, Police Station	3.15	2.23	1.30	0	0
Hospital (General Medical & Surgical)	Ambulatory Surgical Center, Hospital (General Medical & Surgical), Other/Specialty Hospital	6.63	4.68	2.73	0	0
Hotel	Hotel, Other - Lodging/Residential	2.92	2.06	1.20	0	0
K-12 School	K-12 School	1.35	0.95	0.56	0	0
Laboratory	Laboratory	8.93	6.30	3.68	0	0
Multifamily Housing	Multifamily Housing	1.16	0.89	0.63	0.37	0
Non-Refrigerated Warehouse	Distribution Center, Non-Refrigerated Warehouse	1.09	0.77	0.45	0	0
Office	Financial Office, Medical Office, Office, Veterinary Office	1.14	0.81	0.47	0	0
Other <sup>3</sup>	Adult Education, Vocational School, Other - Education, Outpatient Rehabilitation/Physical Therapy, Urgent Care/Clinic/Other Outpatient, Barracks, Prison/Incarceration, Courthouse, Other - Technology/Service, Energy/Power Station, Other - Utility, Other	3.51	2.48	1.45	0	0
Recreation	Bowling Alley, Fitness Center/Health Club/Gym, Ice/Curling Rink, Roller Rink, Swimming Pool, Other - Recreation	4.56	3.22	1.88	0	0



Building Activity Types	Portfolio Manager Building / Space Types Included	2019 Baseline Average	2031 - 2035	2036 - 2040	2041 - 2045 <sup>1</sup>	2046 - 2050 <sup>1</sup>
Refrigerated Warehouse	Refrigerated Warehouse	1.39	0.98	0.57	0	0
Residence Hall/Dormitory	Residence Hall/Dormitory	1.64	1.16	0.68	0	0
Restaurant	Fast Food Restaurant, Restaurant, Other - Restaurant/Bar, Food Service	8.12	5.73	3.34	0	0
Retail Store	Bank Branch, Automobile Dealership, Enclosed Mall, Strip Mall, Other - Mall, Retail Store	1.45	1.03	0.60	0	0
Self-Storage Facility	Self-Storage Facility	0.44	0.31	0.18	0	0
Senior Living Community	Residential Care Facility, Senior Living Community	2.99	2.11	1.23	0	0
Services	Library, Mailing Center/Post Office, Other - Public Services, Personal Services (Health/Beauty, Dry Cleaning, etc.), Repair Services (Vehicle, Shoe, Locksmith, etc.), Other - Services	1.93	1.36	0.79	0	0
Supermarket/Grocery Store	Convenience Store with Gas Station, Convenience Store without Gas Station, Supermarket/Grocery Store, Wholesale Club/Supercenter, Food Sales	4.85	3.42	2.00	0	0
Worship Facility	Worship Facility	1.70	1.20	0.70	0	0

<sup>1</sup> Net zero GHG emissions by compliance year

<sup>3</sup> “Other” has a target based on the mean GHGI across the benchmarked buildings that were too few to warrant a category of their own and had EUI or GHGI characteristics that were too dissimilar from other related types. We recommend additional research to inform development of appropriate GHGI targets for the Portfolio Manager types assigned to “Other”.

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## Analyze impacts

### Base case

We leveraged a recent analysis conducted in 2022 by Lawrence Berkeley National Lab (LBNL) that projected energy use reductions in the 2019 benchmarked buildings out to 2050 due to existing policies, which established the baseline of energy use that would happen without the Seattle BEPS. LBNL provided the following information about the data sources and assumptions they applied.

- Data sources
  - Seattle benchmarking data for 2019 (data: type, area, year built and energy use: electric, gas, steam) which is reported by all buildings over 20,000 sq ft
- If a record for a building had essential information that was ambiguous or incomplete, LBNL used the following methods to extrapolate data to fill in the gaps
  - Overall energy use and fuel splits
    - Fill in site EUI and ratio of electric energy to site energy (“electric/site ratio”) by sampling from other buildings with same building type
    - Compute electric and gas use from site EUI and electric/site ratio
    - Assume no steam use
- Baseline projection starts in 2024 (using 2019 energy data) and ends in 2050
  - One time Building Tune-Ups 4% reduction applied in 2025 for nonresidential buildings greater than 50k square feet

We then applied the Washington state Clean Buildings Performance Standard policy, as follows, assuming all subject buildings comply:

- For nonresidential buildings greater than 50k square feet
  - One target interval in: 2026-2028
  - Buildings with energy use exceeding target reduce energy use, proportionally by fuel, to target EUI in compliance year: >220k square feet in 2026, 90-220k square feet in 2027, 50-90k square feet in 2028

### Distributions of Impacts

Table 2 shows the distribution of buildings projected to meet or exceed the first two proposed Seattle GHGIT compliance intervals. The all-electric buildings are assumed to meet the GHGI targets since Seattle City Light emissions from electricity generation are minimal and the policy proposal exempts buildings whose verified benchmarking data confirms only all electric sources

to the building. Keep in mind that the building counts are based on the 2019 building stock and the total number of buildings in the 2030s is expected to be greater. Furthermore, buildings in this impact analysis were assigned a GHGIT based on the primary Portfolio Manager use type. For actual compliance, buildings will be required to prorate the GHGIT based on the mix of spaces in the building and may take deductions for emissions from specified end uses during certain compliance periods (e.g., cooking in 2031-2040). Normalization factors for hours of operation and multifamily occupancy density will also be developed during program rulemaking and may be applied.

**Table 2 Distribution of Buildings Meeting or Exceeding the GHGI Targets in First Two Compliance Intervals**

	2031 -	2036 -
	2035	2040
<b>Non-Residential</b>		
Meets Seattle GHGIT ( <i>electric only buildings</i> )	23% (385)	23% (385)
Meets Seattle GHGIT ( <i>buildings with mixed energy sources</i> )	34% (578)	16% (277)
<b>Does not meet</b> Seattle GHGIT ( <i>buildings with mixed energy sources</i> )	43% (716)	61% (1,017)
Total	1,679	
<b>Multifamily</b>		
Meets Seattle GHGIT ( <i>electric only buildings</i> )	43% (760)	43% (760)
Meets Seattle GHGIT ( <i>buildings with mixed energy sources</i> )	30% (520)	15% (260)
<b>Does not meet</b> Seattle GHGIT ( <i>building with mixed energy sources</i> )	27% (485)	42% (745)
Total	1,765	

# BEPS Overview and Options for 2031-2035 Targets Compliance

Prepared by: Nicole Ballinger, Office of Sustainability and Environment, 5/30/23

This analysis overview provides a summary of the predicted percentage of buildings expected to meet or exceed the required Seattle Building Emissions Performance Standard (BEPS) targets for 2031-2035 specified in the draft BEPS legislation. It then outlines the policy options buildings owners may choose to for compliance. Lastly it outlines actions a building owner may take to reduce building emissions.

Seattle’s proposed BEPS legislation is expected to cover about 1,650 nonresidential buildings, 1,885 multifamily buildings and 45 campuses (representing approximately 600 buildings) larger than 20,000 SF in the City of Seattle. The policy sets required greenhouse gas intensity targets (GHGITS) for 2031-35 and provisional targets that may be revised by rule for 2036-2050. It also includes several flexible compliance options for buildings with extenuating circumstances.

## Predicted Compliance for 2031-2035 GHGITS

Table 1 summarizes predicted compliance with 2031-2035 greenhouse gas intensity targets (GHGITS) from the 3,444 buildings that reported 2019 energy and emissions benchmarking data.

- **33% (approx. 1,145 buildings) use only electric energy** for heating, water heating, cooking, and other activities such as commercial laundry. If a qualified provider confirms through the BEPS energy benchmarking verification requirement that the building only uses electric energy sources, these buildings **will be exempt from meeting GHGI targets**. This is because electricity in Seattle is supplied by a carbon neutral utility, Seattle City Light, which is also covered under Washington’s Clean Energy Transformation Act (CETA) requirements.
  - 23% of these electric-only buildings are nonresidential and 43% are multifamily.
- **67% (approx. 2,299 buildings) use mixed energy sources, which include higher-emissions sources (gas from PSE and/or district steam from CenTrio) in addition to electricity** for some combination of heating, water heating, cooking and/or other activities.
  - **32% (approx. 578 nonresidential and 520 multifamily) are predicted to already meet the 2031-2035 targets** and will not need to reduce emissions before 2035.
  - **35% (approx. 716 nonresidential and 485 multifamily) are predicted to not meet the 2031-2035 targets** and will need to take action to reduce emissions.

<b>Table 1. Compliance estimates for 2031-2035 BEPS targets based on 2019 benchmarking data.</b>		
<b>Nonresidential</b>		
	Meet Seattle GHGIT ( <i>electric only buildings</i> )	23% (385)
	Meet Seattle GHGIT ( <i>mixed energy source buildings</i> )	34% (578)
	<b>Do not meet</b> Seattle GHGIT ( <i>mixed energy source buildings</i> )	43% (716)
	Subtotal	1,679
<b>Multifamily</b>		
	Meet Seattle GHGIT ( <i>electric only buildings</i> )	43% (760)
	Meet Seattle GHGIT ( <i>mixed energy source buildings</i> )	30% (520)
	<b>Do not meet</b> Seattle GHGIT ( <i>mixed energy source buildings</i> )	27% (485)
	Subtotal	1,765
	<b>Total Buildings</b>	3,444

## Compliance Options for Buildings Predicted to Not Meet Targets in 2031-2035

Seattle's BEPS offers three broad paths to compliance with many flexible options for the predicted 35% (approx. 1,201) buildings that do not meet the required targets in 2031-35. This section highlights several of the options. For a complete overview, review the attached BEPS Compliance Paths chart.

### Path A

- **Standard GHGIT.** Individual buildings, building portfolios or campuses<sup>1</sup> can meet a numerical GHGIT by building type, prorated for the mix of use types in the building, portfolio, or campus (e.g., a mix of office, retail, and restaurant spaces).
- **Alternate GHGIT.** A constant percent emissions reduction target from the building's, portfolio's, or campus's own baseline greenhouse gas intensity (GHGI) for each interval until net-zero emissions is an option for unique building types or buildings with extremely high emissions.
- **All Electric Building.** If a qualified provider confirms through the BEPS energy benchmarking verification requirement that the building only uses electric energy sources, the building will be exempt from meeting GHGI targets.

### Path B

In addition to meeting the targets using the options list for A, Path B gives small modifications that include extensions, emissions deductions for certain energy uses (end-use deductions) or a compliance payment based on social cost of carbon. This provides another way to meet the target fully or partially.

#### Alternative Compliance Payment

- A payment based on the total MTCO<sub>2</sub>e exceeding the target multiplied by the social cost of carbon for 5 years (one compliance interval). Revenues will be used to fund emissions reductions in under-served nonresidential, multifamily, and single-family buildings. This option in effect enables owners who are not ready to make any improvements to their buildings to offset their emissions in other Seattle buildings, for one compliance interval only.

#### Extensions and Exemptions

- **Affordable multifamily and human service uses extension.** Buildings that are occupied by subsidized nonprofits or qualify as low-rent or buildings with at least 50% human services uses like shelters **may be exempt from meeting** the 2031-35 GHGITs. OSE estimates that about 30% of multifamily buildings may be affordable multifamily and a small handful of multifamily and nonresidential buildings have human service uses.
- **High vacancy rate extension.** Commercial leased buildings with an extremely high vacancy due to leasing problems (rate to be determined by rule) may be **exempt from meeting** the 2031-35 GHGITs. This number cannot be estimated because provision will be determined by rule and commercial real estate market conditions fluctuate over time.
- **Other exemptions.** New construction buildings, buildings with pre-existing financial distress and buildings scheduled to be demolished all have exemption options. Based on OSE's prior

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<sup>1</sup> Two or more covered buildings on one or more lots, all owned by the same public, private, or nonprofit entity.

experience with benchmarking and tune-ups, just a small handful of buildings apply for these exemptions in any given compliance interval.

### Emissions Deductions

- **Buildings with CenTrio district energy contracts.** In these buildings, steam represents the majority of the building emissions as it is typically used for space heat and hot water. They may use some on-site gas in small amounts for cooking or in tenant spaces. The legislation has a provision for 2031-35 for buildings using CenTrio energy to deduct emissions from thermal energy since:
  - a) CenTrio customers are typically in long-term contracts with the district energy provider and switching fuels could be a breach of their contract, and;
  - b) CenTrio has indicated to the City of Seattle a commitment to decarbonize their plant and make associated investments over the next decade, which will, in effect, enable these building owners to reduce emissions through CenTrio's plant decarbonization.The benchmarking data indicates that approximately 110 buildings are on CenTrio steam. These buildings will likely use this emissions deduction to meet GHGITs in 2031-35.
- **Other fossil fuel use deductions.** Buildings can deduct emissions from the building's GHGI for various uses like cooking, commercial laundry in hotels and hospitals, process loads in hospitals and labs, emergency generators, and back-up heat in hospitals and labs. Buildings with these uses that are already very close to meeting their GHGIT will likely comply when they apply this deduction.

### Path C

Path C gives special consideration and flexibility to comply. It allows an owner to propose custom GHGI targets and an alternate schedule due to unique circumstances, with a Decarbonization Compliance Plan approved by the City. These circumstances include scenarios such as: work concurrent with a substantial alteration or seismic upgrade to the building, no practicable low/ zero GHG emissions alternatives available, impact to historic building and more.

- **Net-zero by 2041-2050 Decarbonization Compliance Plan.** A customized plan, created by a qualified provider, that shows how the building will achieve net-zero by 2041-2050. Plan must include details such as an energy/emissions audit, cost analysis, custom GHGIT schedule, actions, milestones, and any applicable content specified by decarbonization plan provisions in the Seattle Energy Code.
- **Low Emissions by 2041-2050 Decarbonization Compliance Plan.** A customized plan, by a qualified provider, shows how the building will achieve a low carbon target by 2041-2050. Plan must include details such as an energy/emissions audit, cost analysis, custom GHGIT schedule, actions, milestones, and any applicable content specified by decarbonization plan provisions in the Seattle Energy Code.
- **District Campus Decarbonization Compliance Plan.** A customized plan, by a qualified provider, shows how campus will upgrade its district energy plant to generate cumulative emissions reductions from 2028 – 2050 equal to or greater than the cumulative emissions reductions achievable by meeting GHGIT.

## Actions Building Owners May Choose to Take to Reduce Building Emissions to Meet the 2031-2035 GHGIs

Seattle BEPS offers maximum choice and flexibility for owners to choose actions that work for their building or business need to reduce emissions. For example, they may choose to:

- **Improve Operations and Maintenance.** Actions like those implemented under Seattle’s Building Tune-Ups requirement – like aligning heating and cooling schedules with building occupancy, adjusting heating set-points and following maintenance schedules – all reduce emissions.
- **Install Modern Building Controls.** Modern building controls use smart technologies to sync energy use with building occupant needs for best building performance and comfort. They can also alert building operators to mechanical problems before they waste energy, emissions, and money.
- **Improve Energy Efficiency of Building Systems.** Improving the building’s mechanical systems can result in significant emissions reductions, especially if focused on space heating and water heating systems. For example, efficient distribution fans and pumps can reduce fuel use and emissions. Efficient water fixtures reduce calls for hot water thereby reducing fuel use and emissions. Energy recovery ventilation or ERV is a type of air-to-air heat exchanger that uses exhaust heat to preheat the incoming fresh air supplied to buildings thus dramatically reducing fuel use.
- **Address Walls, Roofs, and Windows.** Adding insulation, sealing air leaks, or investing in new windows not only mitigates heating loss and associated emissions from wasted fuels, but also reduces drafts and noise, and can add value to tenant spaces.
- **Install Right-Sized Energy-Efficient Equipment.** Right-sized, energy efficient equipment can substantially reduce or nearly eliminate emissions. Such replacements could be triggered by the owner’s own asset replacement schedule, equipment failure, owner decision to renovate, or compliance with BEPS. While new equipment is an action that could be used meet BEPS, the prior operations and energy efficiency actions listed above should all be considered first to reduce the buildings base heating and water heating loads. For example, Seattle’s experience in its City owned buildings is that many existing hot water systems are oversized and waste energy and emissions, whereas new systems can be up to 75 percent smaller. This is because older DHW systems were specified before “low-flow” fixtures became standard and/or the current DHW use is less than what was expected when the old system was planned. This reduces both equipment cost and emissions.
- **Purchase Renewable Natural Gas (RNG) to replace conventional natural gas.** The BEPS policy does not require the use of specific fuels. To reduce emissions from gas use, a building owner could purchase low-carbon RNG through Puget Sound Energy’s voluntary program and replace a portion or all (up to 100%) of their conventional natural gas with RNG. This option allows building owners to reduce their emissions fully or partially while using their existing gas equipment. More information about PSE’s program, including price, terms and conditions can be found at [PSE | Renewable Natural Gas](#).