

Seattle's Building Emissions Performance Standard (BEPS) Rulemaking

Technical Meeting with Hospitals and
Laboratories



Agenda

- **Welcome + Introductions (10 minutes)**
- **Introduction to end use deductions (10 minutes)**
- **Fossil fuel high intensity process equipment (45 minutes)**
- **Other end use deductions for hospitals and labs (15 minutes)**
- **Wrap-Up (5 minutes)**



Introductions

- Name, organization, your role at the organization



Introduction to End Use Deductions



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.”



For discussion today:

What are the methods for documenting, metering or estimating emissions deductions?

End use deductions included in BEPS

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

¹SMC 22.925.120



Why are end use deductions included in BEPS?

- Recognize additional variability in building types
- Account for uses that are challenging to replace before the compliance deadline
- Allow time for better or more low emissions market alternatives to be developed and for planning retrofits
- Equity impacts, such as small businesses and condo owners



GHGI targets were created using reported energy benchmarking data

- SBW Consulting used 2019 energy benchmarking data to develop greenhouse gas intensity targets (GHGITs) by building activity type
 - Data includes emissions from end uses that are eligible for deductions
- Few other BEPS jurisdictions offer deductions as a flexibility measure



How are end use deductions factored into compliance GHGI?

ENERGY STAR Portfolio Manager Data	2019 Annual WN Energy Use (kBtu/yr)	2019-2025 Emissions Factors (kg CO2e/kBtu)	Annual GHG Emissions (kg CO2e/yr)
Electric	2,350,000	0.0058	13,630
Gas	2,200,000	0.053	116,600
Steam	0	0.081	0.00
Subtotal	4,550,000		130,230
Less Eligible BEPS Deductions (TBD)	TBD	NA	TBD
Total	4,550,000		130,230
Total Gross Floor Area (excluding parking)			75,000 SF
		BEPS Compliance GHGI (kg CO2e/sf/yr)	1.74

Questions?



Discussion: Fossil Fuel High Intensity Process Equipment



Overview of eligible fossil fuel high intensity process equipment deductions

Eligible Deductions

Any covered hospital or laboratory may deduct emissions from this equipment from compliance GHGI.

Allowed Compliance Periods

2027-2030¹	2031-2035	2036-2040	2041-2045	2045-2050
yes	yes	yes	no	no

Proposed method(s) for documenting, metering, or estimating deduction

- Standardized calculation procedures in development – discussion for today
- Submeter



Defining *fossil fuel high intensity process equipment*

- Specialized hospital or lab equipment that is powered by fossil fuels
 - Not intended to include space heating HVAC or domestic hot water equipment
 - Not intended to include electric high intensity process equipment (because already very low emissions)



Categorizing process equipment in hospitals and laboratories

Equipment that is already electrically powered

- Imaging equipment (MRI, CT, X-Ray)
- Cold room equipment, refrigeration systems, and freezers
- Fans and fume hoods
- Miscellaneous electric (robots, lights)
- Irradiation equipment

Fossil fuel equipment with no or few electric alternatives

- Process humidification equipment
- Sterilization equipment (autoclaves, high temperature instrument washers, etc.)
- Bench equipment (gas line e.g. for Bunsen burners)

Equipment covered by other deductions

- Commercial kitchen equipment
- Fossil fuel laundry equipment
- Emergency backup generators
- Fossil fuel backup heat



Discussion goals for today

- Is there anything that is:
 - Miscategorized from this list?
 - Critical to add?
- Of the list of equipment, identify:
 - Most common
 - Highest priority
 - Highest emitting
- Provide feedback on draft calculation methods
 - Key information to inform calculations: hours of use, process load, capacity equivalent, cut sheets



Options for taking equipment deductions

Use standardized
calculation
procedures to
estimate emissions

and/or

Submeter individual
end uses

Questions?



Discussion



Other end use deductions for hospitals and/or labs



Proposed for rule: Clarifying ordinance language

What the ordinance says...

(SMC 22.925.120) “Fossil fuel generators used exclusively for emergency back-up power or fossil fuel equipment used for back-up emergency heat in hospitals and laboratories.”

Clarifications:

- **Any covered building** is eligible to take the **back-up emergency generator power deduction**
- **Only hospitals & labs** are eligible to take the fossil fuel **back-up emergency heat deduction.**



Fossil fuel generators used for emergency back-up power

Eligible Deductions

Any covered building with emergency backup generators may deduct emissions from this equipment from compliance GHGI.

Allowed Compliance Periods

2027-2030¹	2031-2035	2036-2040	2041-2045	2045-2050
yes	yes	yes	yes	yes

Proposed method(s) for documenting, metering, or estimating deduction

- Delivered fuels (diesel and fuel oil) are often not reported in energy benchmarking
- If not reported, no need to take deduction
- If benchmarking for ESG reasons, take deduction



Back-up fossil fuel emergency heat in hospitals and labs

Eligible Deductions

Any covered hospital or laboratory facility may deduct emissions from this equipment from compliance GHGI.

Allowed Compliance Periods

2027-2030¹	2031-2035	2036-2040	2041-2045	2045-2050
yes	yes	yes	yes	yes

Proposed method(s) for documenting, metering, or estimating deduction

- Intent from stakeholders was to account for:
 - Heating capacity during extreme cold or in event of power failure
- Only take deduction when the building has electric system based on system design – *Questions on this proposal?*

Fossil fuel high intensity laundry equipment used in hotels and healthcare

Eligible Deductions

Any covered hotel or healthcare-related building activity type* may deduct emissions from this equipment from compliance GHGI.

*Includes hospital, nursing home, rehabilitation center, etc.

Allowed Compliance Periods

2027-2030¹	2031-2035	2036-2040	2041-2045	2045-2050
yes	yes	yes	no	no

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

Proposed method(s) for documenting, metering, or estimating deduction

- Natural gas is the primary heating source to dry clothes and linens. Eligible models include any commercial gas dryer in a hotel or healthcare facility. Multiply total number of dryers by GHG deduction to yield annual deduction.
- Dedicated boilers for laundry provide hot water to washing machines in a hotel or healthcare facility. Multiply total dedicated boiler capacity in tons (1 Ton capacity = 12000 BTU/hour) by GHG deduction to yield the total annual deduction.



Discussion & Questions



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!



Summary Slides of Group Discussion

See summary notes for further detail



Categorizing process equipment in hospitals and laboratories

Equipment that is already electrically powered	Fossil fuel equipment with no or few electric alternatives	Equipment covered by other deductions
<p>Imaging equipment (MRI, CT, X-Ray)</p> <p>Cold room equipment, refrigeration systems, and freezers</p> <p>Fans and fume hoods</p> <p>Miscellaneous electric (robots, lights)</p> <p>Irradiation equipment</p>	<p>Process humidification equipment</p> <ul style="list-style-type: none"> • Part of HVAC systems • There are alternatives: steam from electricity, but very inefficient; abiotic humidification, but unproven; heat pump steam, maybe down the road • Often humidification in HVAC systems is driven by compliance requirements, NIH/IACAUC/OLAW requirements • DNV and Joint Commission also regulate hospitals <p>Sterilization equipment (autoclaves, high temperature instrument washers, etc.)</p> <ul style="list-style-type: none"> • Largest load outside of humidification <p>Bench equipment (gas line e.g. for Bunsen burners)</p>	<p>Commercial kitchen equipment</p> <p>Fossil fuel laundry equipment</p> <p>Emergency backup generators</p> <ul style="list-style-type: none"> • State DOH needs to approve what is required to be on emergency power and run times needed for backup systems. If equipment uses more energy, can be challenging • Electrifying hospitals drives to much larger emergency power needs, 30-50% increase, higher cost, more space needed • Waste heat recovery possible <p>Fossil fuel backup heat</p>



Equipment	Commonly used?	High emissions?	Few alternatives?
Sterile processing equipment.	Supports ORs. 1.6m sqft facility has 3, will be 4. 3 shifts M-F and weekends. SCRD has them at all locations	Process steam. Use is intense but intermittent - spiky peak	Alternatives not yet proven. Expensive and challenging to move to electric steam. Sterilizers are in small spaces. Lack of redundancy, larger generator sizes, can't direct swap steam for heat pump
Washers	Yes		Wider array of alternatives available
Vivarium Sterilizers/Washers		Larger load	Harder to find alternatives
Kitchen dishwashing (carry over to restaurant exemption discussion)			
Process humidification	Used for controlling critical areas - allow procedures to take place safely.	Steam has to always be ready to use, and hot enough to stay sterile	Steam systems have few viable alternatives, and current options feel unproven

Details about highest priority equipment

Equipment	<ul style="list-style-type: none"> •Process loads (Eg. Pounds of laundry, pounds of instruments washed, etc) •Hours of use •Amount of energy use when running •Spec sheet/cut sheet: hard to pull numbers we need from this, b/c sized for maximum capacity. Field measurement needed
Sterilization equipment	<ul style="list-style-type: none"> •Research 8 hours a day M-F (SRCD), sometimes 4 sometimes full day •Hospitals 7 days a week, 12-14 hours a day
Vivarium washers	<ul style="list-style-type: none"> •Research 8 hours a day M-F (SRCD), sometimes 4 sometimes full day •Not used in hospitals
Process humidification	<ul style="list-style-type: none"> •Depends on time of year, but when running, 24 hours a day. Depends on set point of space. Less use in humid summers •30-70%, ORs 72 and 50% or 68 & 60% •Labs have 100% outside air system. Cubic feet of air •ASHRAE guidelines for air changes is a good indicator •DOH also has guidelines with temperatures, humidity, etc and is different from ASHRAE. More particular, and more room definitions •Not a point source delivery - will likely serve areas besides OR. Materials stored adjacent to surgery also need humidity tolerance. SBW needs sq ft of all related rooms that need humidity maintenance as well •NIH, ANSI Std Z9, and OLAW will give Vivarium recommendations
Vivarium sterilizers	<ul style="list-style-type: none"> •Research 8 hours a day M-F (SRCD), sometimes 4 sometimes full day •Not used in hospitals

