

NOVEMBER 13TH 2024 - MEETING SUMMARY

Focused Meeting on Hospital & Laboratories End-Use Deductions Technical Content for BEPS

Zoom Call 10AM-12PM

Present: Andrew Gray, Bonnie Frye Hemphill, Geoff Glass, Melanie Petherick, Mel Knox, Michael Bigelow, Srin Pendikatla, Steve Brooks, Tyler Stuart.

City of Seattle BEPS and Facilitation Staff: Gemma Holt and Nicole Ballinger (OSE), Anna Kelly, Catherine Ozols, Faith DeBolt, and Santiago Rodriguez-Anderson (SBW), Kirstin Pulles and Sepideh Rezaia (Unrooz)

Meeting slides are posted at: <https://www.seattle.gov/environment/climate-change/buildings-and-energy/building-emissions-performance-standard/beps-rulemaking>

Agenda:

Topic	Time
Welcome + Introductions	10 mins
Review: Introduction to end use deductions	10 mins
Discussion: Fossil fuel high intensity process equipment used in hospital and laboratories	45 mins
Review: Other end use deductions for hospitals and labs <ul style="list-style-type: none">• OSE clarified what other deductions are available for hospitals and labs, including fossil fuel generators for emergency back-up power• Introduced the idea of back-up fossil fuel emergency heat in hospitals and labs	15 mins
Wrap-Up & Next Steps	10 mins

Working Group Discussions Summary:

1. Introduction to end use deductions.

Topic: The BEPS ordinance (SMC 22.925.120) says that “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”:

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

End use deductions are included in BEPS for multiple reasons:

- 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

End use deductions allow for a building owner to deduct specific energy usage from their total energy usage, reducing their reported GHGI.

Discussion:

1. Attendee: Can hospitals take kitchen deductions if they have a kitchen?
 - a. OSE: Building owners can take any deductions that apply. If not otherwise specified to a building type, it can be assumed that it applies to all covered building types.
2. Attendee: Do the deductions need to be sub-metered?
 - a. OSE: Submetering is the most accurate way to measure energy use for specific equipment, but we know there are complications, so we're going

to discuss alternate methods that use standard estimations for equipment types.

2. Fossil fuel high intensity process equipment.

Topic: Any covered hospital or laboratory may deduct emissions from high intensity process equipment deductions from compliance GHGI. These deductions are allowed for the 2027-2030, 2031-2035, and 2036-2040 compliance periods only. OSE is proposing that the deductions can be taken either by using standardized calculation procedures or by submetering the equipment's energy usage. Fossil fuel high intensity process equipment includes specialized hospital or lab equipment that is powered by fossil fuels. It's not intended to include space heating HVAC or domestic hot water equipment or electric high intensity process equipment (because electricity is already very low emissions).

OSE asked the attendees to help identify the highest priority high intensity process equipment and to share details about that equipment. The information obtained will be used by OSE to investigate possible estimated standard calculation methodologies that could be used by hospitals and laboratories to take end-use deductions. This would be in lieu of or an alternative to submetering.

Discussion:

1. An attendee shared that the hospital decarbonization study done for St. Peters Hospital in partnership with American Hospital Association should be available early December and will be a god resource to inform this work.
2. Attendee: We have an existing steam plant that helps us support some of our sterilization equipment, autoclaves, but we also utilize that system to reheat water and plumbing systems through the building, through the building, through heat exchangers. How would those systems sort of be approached in these categories?
 - a. OSE: The intent of the ordinance was that domestic hot water itself is not considered specialized equipment. Could discuss ways to account for the amount used specifically for process uses.
3. Attendee: Process humidification is part of HVAC systems. There are two lower emission alternatives: steam from electricity, but it's very inefficient; and adiabatic humidification, but it's unproven.
4. Attendee: When we switch from fossil fuel to electric, the State DOH has requirements about what is required to be on emergency backup systems.
5. Attendee: Vivariums have National Institute of Health (NIH) and Institutional Animal Care and Use Committee (IACUC) requirements to have dedicated gensets.
6. Attendee: Does BEPS qualify humidification equipment as HVAC or process equipment? Because hospitals don't have a choice in some of this equipment being installed – it's a life safety issue.

- a. OSE: That's part of the discussion today.
7. Attendee: Electric equipment, even when it's more efficient, can require huge increases in generator sizes to meet emergency backup needs. This is expensive and requires a lot of extra space.
8. Attendee: Sterilizers and washer equipment is our biggest load outside of HVAC.
9. OSE: How are new all-electric hospitals managing emergency backup power?
 - a. Attendee: We're building a tower in [location] that's all electric and we're finding that this 260,000 square foot tower is going to require a four-megawatt generator.
 - b. Attendee: I'm possibly looking at a three-megawatt unit for a 400,000 square foot facility in order to support the process load requirements.
10. Attendee: We have a sterile processing unit at SCH that supports operating rooms. ORs are top of mind because they are the biggest source of revenue for hospitals. It requires process steam. Our 1.6 million square foot facility has three steam autoclaves and is scheduled to have 4. They run three shifts Mon-Fri and some weekends, so it's a constant load but the steam use is intermittent. The steam cycle is like a very high-powered dishwasher, for lack of a better analogy, and it'll use steam very intensely for a short period of time and then do the rest of its cycle. So it's very much a spiky peak kind of a pattern. We also have an ambulatory surgery center that has four ORs. We also have two autoclaves at that location as well, that's outside of the city.
11. Attendee: We have sterilizers at all of our locations, and usually a set of washers that support lab research work. Some use a central steam plant and others have dedicated steam generators. In new construction we're trying to move to electric steam generators to get off of the central plant steam. Electric steam is expensive and challenging, mostly for space. Sterilizers are in small spaces, so you need to allocate space for the new equipment and for utilities. There are a larger array of washer options, and some don't use steam, but some washers do use steam. Vivarium washers and sterilizers are unique equipment that can be a much larger load and harder to find non-steam options.
12. An attendee mentioned dishwashers as a high energy using piece of kitchen equipment.
13. Attendee: Equipment connected to multiple boilers is redundant. If you move to a single boiler for a piece of equipment you lose redundancy.
14. An attendee mentioned backup generator challenges.
15. Attendee: If you look at the timeline for conversions, the short-term technologies available are not a single plant. There is no direct swap for a steam plant to a heat pump. The short-term solution is to decentralize the steam plant vs swapping to a heat pump. This may prevent a future swap-out to a central heat pump when the technology improves.
16. Attendee: I agree with that.
17. Faith DeBolt: Should we have a way to reduce the emissions deduction amount if some of the waste heat from these processes is being used to heat your domestic hot water?
 - a. Attendee: Can we respond to that offline?
 - b. Attendee: Waste heat is returned to the central plant.

- c. Attendee: We use the steam plant to connect to heat exchangers to supply hot water throughout the building.
 - d. Attendee: We've been upgrading some of our autoclave equipment and putting in new, dedicated, distributed steam generators for these autoclaves, taking them off the central steam system and that condensate that's associated with that equipment is not being recovered. And to be able to try and include that into some kind of recovery system would be very costly for all these distributed pieces of equipment.
18. Attendee: Process humidification is used for controlling certain critical areas: ORs, catheter labs, some pharmacies, things like that. You don't know when you'll need it so you need to always have the steam ready and it has to be hot enough to be sterile. Humidifiers are often in duct systems that are hard to access. These systems need to meet many needs beyond energy use.
19. Attendee: The days of Bunsen burners in labs and hospitals are mostly behind us.
20. Attendee: With fume hoods and refrigeration, how do we view the tie for these loads with emergency backup power?
- a. Kirstin Pulles: While they're online using electricity, they're low emission. If power goes down and you need to use the emergency backup power, the fossil fuel used there would be exempt.
21. Attendee: Emergency generators produce a lot of heat and that can be captured.
22. Attendee: We are running all of our sterilizers and washers approximately 8 hours a day M-F in our labs and vivariums.
23. Attendee: For hospitals for sterilization equipment we're probably 12-14 hours a day seven days a week.
24. Attendee: Process humidification will depend on the time of year, but when it's running it's 24 hours a day. It won't really be needed during humid summers.
25. Santiago Rodriguez Anderson: What are you aiming for for average temperature and humidity?
- a. Attendee: We have a range based on vivarium guidelines that's 30-70.
 - b. Attendee: ORs will be 72 and 50%, and it might be 68 and 60%. ORs are more prescriptive.
 - c. Attendee: It's 100% outside air that we use so cubic feet per minute of air is going to drive our humidification load.
 - d. Santiago Rodriguez-Anderson: Could we reference ASHRAE guidelines for air changers per hour?
 - e. Attendee: For hospitals, the State DOH has tables for air change rates and percentage outside air mix because ORs aren't 100% outside air anymore. They're a blend of outside and recirculated. They have specific tables on temperatures and humidity and they're different than ASHRAE's. DOH is specific to Seattle and would be more relevant to use.
26. Attendee: It's very hard to pull the relevant numbers for hours of use and loads from cut sheets. They're sized for peak capacity but it's hard to figure out what's actually happening with energy use from them. We often have to go to the field and measure.
27. Attendee: Would run time for hours of humidification systems be useful?

[Attendee], I think we have that from [Location]. We could pull those and get annualized hours of demand. I'll see if I can find that.

- a. Santiago Rodriguez-Anderson: That would be great, or pounds of water, anything to estimate total steam produced.
- b. Attendee: Humidification is not point source delivery. It will serve areas besides the OR.
- c. Santiago Rodriguez-Anderson: I was planning to estimate square footage for ORs and estimate the volume of steam needed based on that.
- d. Attendee: Adjacent spaces may also need to be humidified for packs and material storage – it's broader than just ORs. You should measure all relevant rooms.

3. Other end use deductions for hospitals and/or labs.

OSE reviewed three additional deductions.

Fossil fuel generators used for emergency back-up power: Any covered building with emergency backup generators may deduct emissions from this equipment from compliance GHGI, and the exemption is available for every compliance period.

Back-up fossil fuel emergency heat in hospitals and labs: Any covered hospital or laboratory facility may deduct emissions from this equipment from compliance GHGI, and the exemption is available for every compliance period.

Fossil fuel high intensity laundry equipment used in hotels and healthcare: Any covered hotel or healthcare-related building activity type (Including hospitals, nursing homes, rehabilitation centers, etc.) may deduct emissions from this equipment from compliance GHGI. It is available only for compliance cycles 2027-2030, 2031-2035, and 2036-2040.

Discussion:

1. Attendee: Emergency backup cooling should be considered.
 - a. OSE: Heating is generally more fossil fuel intensive. The assumption is that backup fossil fuel heat is to backup electric heating systems.
2. Attendee: Would this mean that we can design an electric system that uses fossil fuels during extreme cold periods?
 - a. OSE: Yes, the intent of this deduction, based on stakeholder engagement during the policy, was to account for keeping some redundant back-up fossil fuel boilers or furnaces functional, that could then be called on to operate during peak loads like extreme cold or during power failures.
3. Attendee: Doesn't this fall into the same boat as delivered fuels?
 - a. OSE: No, because in this case we're talking about having some redundancy or doing "partial" electrification where fossil fuel systems are only called to operate during peak loads like extreme cold or during power failures. It's a distinctive deduction.
4. Attendee: [Location] doesn't have laundry, it's outsourced. Do other healthcare buildings, like ambulatory surgical centers, care facilities, that aren't hospitals

have access to these exemptions?

- a. OSE: Many of the building types you described would be defined as the hospital building activity type for BEPS, but we note your point about nursing homes and can consider clarifications during rulemaking about other space types that might be eligible. For awareness, we are going to propose a specific target for medical offices because they have higher energy use than offices.

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