

January 22, 2021

## MEMORANDUM

**To:** Land Use & Neighborhoods Committee  
**From:** Ketil Freeman and Yolanda Ho, Analysts  
**Subject:** Council Bills 119992 and 119993 – 2018 Seattle Construction Code Updates

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On January 27, 2021, the Land Use & Neighborhoods Committee (Committee) will discuss and possibly vote on [Council Bill \(CB\) 119993](#) that would adopt the 2018 Seattle Energy Code and [CB 119992](#) that would adopt new editions of Seattle’s other construction codes. The Committee received an initial briefing on the legislation from the Seattle Department of Construction and Inspections (SDCI) on January 13, 2021.

This memorandum provides (1) background of the legislation; (2) a description of the proposed 2018 Seattle Energy Code and notable changes; (3) an overview of the other construction code updates; and (4) proposed amendments to CB 119993.

### Background

Seattle updates its construction codes approximately every three years, following the update cycle of the International Code Council (ICC) to its model codes and subsequent amendments to the model codes adopted by the Washington State Building Code Council (SBCC). Typically, both the State and the City adopt their construction code updates about a year after the ICC releases the new edition of its model codes. A one-time extension to four years for the 2018 code update to allow for changes to the SBCC’s review process and the impacts of the COVID-19 pandemic delayed the code update process.

Of Seattle’s construction codes, the Energy Code requires the most extensive outreach and engagement with a wide variety of stakeholders because of the City’s commitment to increase building energy efficiency well beyond the standards adopted by the State. The State’s Energy Code update process began in January 2019 and ended in November 2019, when the SBCC adopted the [2018 Washington State Energy Code](#). Between January and August 2020, SDCI hosted eight public review meetings regarding the 2018 Seattle Energy Code update and received 25 [comments](#) in response. Additionally, SDCI presented information about the update to 40 different organizations. As part of the process, the City’s [Construction Codes Advisory Board](#) considers potential Seattle-specific amendments to the construction codes, suggests changes, and then votes to recommend adoption of the proposals.

The 2018 editions of the State’s and City’s construction codes were originally intended to go into effect on July 1, 2020, but after the Governor issued [Proclamation 20-40](#) in response to the COVID-19 pandemic, this was delayed to November 1, 2020, and the SBCC subsequently voted to further delay the effective date to February 1, 2021. Seattle’s construction codes updates are

proposed to go into effect on March 15, 2021. SDCI conducted the required environmental review of both proposals and issued a Determination of Non-Significance (DNS) for each in December 2020. The appeal period ended on December 31, 2020, and neither DNS was appealed.

### **2018 Seattle Energy Code (CB 119993)**

CB 119993 would adopt the 2018 Seattle Energy Code. The City Council adopted the [2015 Seattle Energy Code](#) with the passage of [Ordinance 125159](#) in October 2016. Guided by Seattle's [Climate Action Plan](#) and [Resolution 30280](#) (identifying actions to accelerate Seattle's Green Building Program<sup>1</sup>), Seattle's practice is to adopt an amended version of the Washington State Energy Code that requires new multifamily residential buildings taller than three stories and all new commercial buildings to conform to higher standards than those required by the State. These regulations also apply to alterations/replacement of existing building components. State law does not allow the City to amend the provisions of the Energy Code that apply to residential development.

As has been the case in prior years, the SBCC adopted some of the City's amendments included in the 2015 Seattle Energy Code into the 2018 Washington State Energy Code, making those changes part of the baseline code across the state. Any amendments to the 2015 Seattle Energy Code not incorporated into the 2018 Washington State Energy Code are included in the proposed 2018 Seattle Energy Code so that Seattle continues to build upon its progress towards achieving greater energy efficiency.

#### Notable Changes

Consistent with [Resolution 31895](#) that established a Green New Deal for Seattle in August 2019 and [Executive Order 2020-01](#) (Advancing a Green New Deal for Seattle), the proposed 2018 Seattle Energy Code would add to the code's intent section the goal of reducing carbon emissions to the existing goal of increasing energy efficiency. To help achieve these goals, the most significant changes from the 2015 Seattle Energy Code are new restrictions on the use of fossil fuels and electric resistance for space and water heating. The water heating restrictions are limited to multifamily and hotel uses, based on the rationale that they have more predictable hot water demand as compared to commercial uses. Both restrictions would have a delayed effective date of January 1, 2022, to allow for additional outreach, and, specific to water heating, provide time for products meeting the requirement to become more readily available.

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<sup>1</sup> Resolution 30280, adopted by the Council in February 2001, directs SDCI to amend the Seattle Energy Code to "achieve energy savings up to 20 percent beyond the current American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and Illuminating Energy Society of North America (IESNA) energy efficiency requirements for nonresidential buildings: ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings."

Other measures included in the legislation would support Seattle’s efforts to improve building insulation; increase efficiency of space heating, water heating, and lighting; and increase the use of renewable energy. Below is a high-level summary of additional key changes in the proposed 2018 Seattle Energy Code:

- Recognize heat loss of through-wall mechanical equipment, concrete balconies, and window frames when calculating insulating value of walls to improve insulation;
- Require improved thermal properties of windows to reduce energy loss;
- Add multifamily and certain medical office buildings to list of buildings required to comply with Total System Performance Ratio, which requires more efficient heating ventilation and air conditioning (HVAC) systems;
- Add new HVAC control and efficiency provisions for ventilation and heat recovery;
- Require insulation, control, and efficiency improvements to hot water circulation;
- Provide luminaire-level lighting controls (LLLC) or networked lighting control system for open office areas larger than 5,000 square feet to allow for greater control of interior lighting;
- Reduce interior lighting power allowances (LPAs) 10 percent below State code levels to limit maximum lighting levels;
- Provide electrical receptacles at gas-fired appliances in dwelling units to accommodate future electric appliances;
- Increase on-site minimum required renewable energy production capacity from 0.07 watts per square foot of building floor area to 0.25 watts per square foot, based on area of all floors;
- Increase number of efficiency credits required from six to eight credits for projects following the Prescriptive Path<sup>2</sup>;
- Set Target Performance Path targets 12 percent above American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Appendix G Building Performance Factor values; and
- Prohibit building envelope heat loss more than 10 percent greater than prescriptive code for energy modeling, as compared to 20 percent allowed by State code.

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<sup>2</sup> A project may achieve Energy Code compliance through one of three different pathways: (1) Prescriptive Path, where the project incorporates specific energy-saving measures from a limited menu of options; (2) Total Building Performance Path, which uses the project’s energy model to demonstrate compliance, allowing building designers to use a wide variety of strategies to achieve energy efficiency; and (3) Target Performance Path, which is similar to the Total Building Performance Path, but has an additional requirement that the project submit utility bills to verify that it is achieving its modeled energy use targets (also known as an outcome-based compliance path).

### Other Construction Code Updates (CB 119992)

CB 119992 would adopt the 2018 Seattle Construction Codes. The construction codes consist of the following eight regulatory codes: (1) the Boiler and Pressure Vessel Code; (2) the Building Code; (3) the Electrical Code; (4) the Existing Building Code; (5) the Fuel Gas Code; (6) the Mechanical Code; (7) the Plumbing Code; and (8) the Residential Code. Changes to the Construction Codes are informed by international, national, and state-level code development organizations.<sup>3</sup> State law requires that the City adopt and enforce State codes and provides limited authority for the City to amend those codes.<sup>4</sup> Generally, the construction codes provide minimum performance and accessibility standards for construction of new buildings, and maintenance and rehabilitation of existing buildings, to improve the life and safety conditions for building occupants.

Notable changes in the construction codes are summarized in the summary and fiscal note to the bill. Changes in the Building and Residential Codes that resonate in other policy areas of recent interest to the Council are highlighted in the table below.

Code	New Provision
Building Code	<ul style="list-style-type: none"><li>• Codifies standards for construction with cross-laminated timber for structures up to 18 stories.</li><li>• Codifies standards for gender-neutral toilets, including full height walls around toilets.</li><li>• Adds new standards for tsunami loads for construction in areas of the city at risk of inundation by a tsunami.</li><li>• Modifies seismic design provisions based on updated modeling for how structures for the seismic zone in which the City is located interact with underlying soil during an earthquake.</li></ul>
Residential Code	<ul style="list-style-type: none"><li>• Requires fire sprinklers for new townhouse development.</li><li>• Establishes new standards for “tiny houses,” which are defined as single dwelling structure less than 400 square feet in size, excluding sleeping lofts.</li></ul>

<sup>3</sup> The Seattle Boiler and Pressure Vessel Code is an exception to this. Seattle promulgates its own regulations for steam heating.

<sup>4</sup> See [Section 19.27.060, Revised Code of Washington](#).

## **Proposed Amendments to CB 119993**

There are two amendments proposed for CB 119993:

- Amendment 1 (Attachment 1), sponsored by Councilmember Mosqueda, would eliminate the effective date delay of January 1, 2022, for restrictions on the use of electric resistance or fossil fuels for space heating. This amendment would make the restrictions go into effect on March 15, 2021, the effective date of the proposed 2018 Seattle Energy Code.
- Amendment 2 (Attachment 2), sponsored by Councilmember Lewis, would eliminate the exemption for commercial buildings related to restrictions on the use of fossil fuels for water heating, requiring commercial buildings to use electric water heating systems beginning on January 1, 2022.

If adopted by the Committee, Amendment 2 would require additional environmental review because it was not evaluated as part of the original proposal. This added process would delay implementation of the 2018 Seattle Energy Code by at least a month. To avoid this delay, the Committee could consider the proposal as separate legislation so that the 2018 Seattle Energy Code can go into effect on March 15, 2021, as proposed.

### **Attachments:**

1. Amendment 1 to CB 119993
2. Amendment 2 to CB 119993

cc: Dan Eder, Interim Director  
Aly Pennucci, Supervising Analyst

Yolanda Ho

Date: January 27, 2021

Land Use and Neighborhood Committee

Version: 1

## Amendment 1

to

### CB 119993 - SDCI 2018 Energy Code ORD

Sponsor: CM Mosqueda

Space heating restrictions effective date

**Effect:** Beginning on January 1, 2022, CB 119993 would prohibit new commercial and multifamily buildings from using electric resistance or fossil fuels for space heating. This amendment would eliminate the delay to the effective date of this provision, making it effective on March 15, 2021, the effective date of the proposed 2018 Seattle Energy Code.

Amend Section C403.1.4 of Attachment A of CB 119993, as follows:

\* \* \*

**C403.1.4 Use of electric resistance and fossil fuel-fired HVAC heating equipment.** HVAC heating energy shall not be provided by electric resistance or fossil fuel combustion appliances. For the purposes of this section, electric resistance HVAC heating appliances include but are not limited to electric baseboard, electric resistance fan coil and VAV electric resistance terminal reheat units and electric resistance boilers. For the purposes of this section, fossil fuel combustion HVAC heating appliances include but are not limited to appliances burning natural gas, heating oil, propane, or other fossil fuels.

**Exceptions:**

~~1. **Effective date.** Permits applied for prior to January 1, 2022.~~

~~2~~ **1. Low heating capacity.** Buildings or areas of buildings, other than *dwelling units* or sleeping units, that meet the interior temperature requirements of IBC Chapter 12 with a total installed HVAC heating capacity no greater than 8.5 BTU/h (2.5 watts) per square foot of *conditioned space* are permitted to be heated using electric resistance appliances. For the purposes of this exception, overhead or wall-mounted radiant heating panels installed in an unheated or semi-heated space, insulated in compliance with Section C402.2.8 and controlled by occupant sensing devices in compliance with Section C403.11.1 need not be included as part of the HVAC heating energy calculation.

~~3~~ **2. Dwelling and sleeping units.** Dwelling or sleeping units having an installed HVAC heating capacity no greater than 750 watts in any separate habitable room with

exterior fenestration are permitted to be heated using electric resistance appliances.

**a. Corner rooms.** A room within a dwelling or sleeping unit that has two primary walls facing different cardinal directions, each with exterior fenestration, is permitted to have an installed HVAC heating capacity no greater than 1000 watts. Bay windows and other minor offsets are not considered primary walls.

**4.3.** Small buildings. Buildings with less than 2,500 square feet of *conditioned floor area* are permitted to be heated using electric resistance appliances.

**5.4.** Defrost. Heat pumps are permitted to utilize electric resistance as the first stage of heating when a heat pump defrost cycle is required and is in operation.

**6.5.** Air-to-air heat pumps. Buildings are permitted to utilize internal electric resistance heaters to supplement heat pump heating for air-to-air heat pumps that meet all of the following conditions:

**a.** Internal electric resistance heaters have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery.

**b.** The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower.

**c.** The heat pump complies with one of the following:

**1.** Controlled by a digital or electronic thermostat designed for heat pump use that energizes the supplemental heat only when the heat pump has insufficient capacity to maintain set point or to warm up the space at a sufficient rate.

**2.** Controlled by a multistage space thermostat and an outdoor air thermostat wired to energize supplemental heat only on the last stage of the space thermostat and when outdoor air temperature is less than 32°F.

**3.** The minimum efficiency of the heat pump is regulated by NAECA, its rating meets the requirements shown in Table C403.3.2(2), and its rating includes all usage of internal electric resistance heating.

**d.** The heat pump rated heating capacity is sized to meet the heating load at an outdoor air temperature of 32°F or lower and has a rated heating capacity at 47°F no less than 2 times greater than supplemental internal electric resistance heating capacity, or utilizes the smallest available factory-available internal electric resistance heater.

**7.6.** **Air-to-water heat pumps, up to 2,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity no greater than 2000 kBTU/hr at 47°F, and that meet all of the following conditions:

- a. Controls for the auxiliary electric resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 32°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
- b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.
- c. The heat pump rated heating capacity at 47°F is no less than 2 times greater than supplemental electric resistance heating capacity.

**8.7.** **Air-to-water heat pumps, up to 3,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 2000 kBTU/hr and no greater than 3000 kBTU/hr at 47°F, and that meet all of the following conditions:

- a. Controls for the auxiliary electric resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 36°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
- b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.
- c. The heat pump rated heating capacity at 47°F is no less than 1.75 times greater than supplemental electric resistance heating capacity.

**9.8.** **Air-to-water heat pumps, over 3,000 MBH.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems that have air-to-water heat pump heating capacity greater than 3000 kBTU/hr at 47°F and that meet all of the following conditions:

- a. Controls for the auxiliary resistance heating are configured to lock out the supplemental heat when the outside air temperature is above 40°F unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.



- b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F or lower except during startup or defrost operation.
- c. The heat pump rated heating capacity at 47°F is no less than 1.5 times greater than supplemental electric resistance heating capacity.

**40 9.** **Ground source heat pumps.** Buildings are permitted to utilize electric resistance auxiliary heating to supplement heat pump heating for hydronic heating systems with ground source heat pump equipment that meets all of the following conditions:

- a. Controls for the auxiliary resistance heating are configured to lock out the supplemental heat when the outdoor air temperature is above 32°F, unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
- b. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor temperature of 17°F or lower.
- c. The heat pump rated heating capacity at 32°F entering water conditions is no less than 2 times greater than supplemental electric resistance heating capacity.

**44 10.** **Small systems.** Buildings in which electric resistance or fossil fuel appliances, including decorative appliances, either provide less than 5 percent of the total building HVAC system heating capacity or serve less than 5 percent of the *conditioned floor area*.

**42 11.** **Specific conditions.** Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions *approved* by the *code official* for research, health care, process or other specific needs that cannot practicably be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.

**43 12.** **Kitchen exhaust.** Make-up air for commercial kitchen exhaust systems required to be tempered by Section 508.1.1 of the International Mechanical Code is permitted to be heated using electric resistance appliances.

**44 13.** **District energy.** Steam or hot water district energy systems that utilize fossil fuels as their primary source of heat energy, that serve multiple buildings, and that were already in existence prior to the effective date of this code, including more energy-efficient upgrades to such existing systems, are permitted to serve as the primary heating energy source.

**45 14.** **Heat tape.** Heat tape is permitted where it protects water-filled equipment and piping located outside of the *building thermal envelope*, provided that it is

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configured and controlled to be automatically turned off when the outside air temperature is above 40°F.

**15**. **Temporary systems.** Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than 40°F.

**16**. **Emergency generators.** Emergency generators are permitted to use fossil fuels.

**17**. **Pasteurization.** Electric resistance heat controls are permitted to reset the supply water temperature of hydronic heating systems that serve service water heating heat exchangers during pasteurization cycles of the service hot water storage volume. The hydronic heating system supply water temperature shall be configured to be 145°F or lower during the pasteurization cycle.

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## Amendment 2

to

### CB 119993 - SDCI 2018 Energy Code ORD

Sponsor: CM Lewis

Commercial water heating restriction

**Effect:** As introduced, CB 119993 would require that multi-family and hotel uses use electric water heating systems but exempt commercial buildings from this requirement, allowing them to use systems that rely on fossil fuels. This amendment would eliminate this exemption and require that commercial buildings use only electric water heating systems beginning on January 1, 2022.

Amend Sections C404.2.3, C406.8, and C406.8.1, and Table C406.1 of Attachment A of CB 119993, as follows:

**C404.2.3 ~~Group R-1 and R-2 occupancies Buildings~~ with central service water heating systems.** In buildings with central service water heating systems ~~serving four or more Group R-1 or R-2 dwelling or sleeping units~~, the primary water heating equipment shall not use fossil fuel combustion or electric resistance. Service hot water shall be provided by an air-source heat pump water heating (HPWH) system meeting the requirements of this section. Supplemental service water heating equipment is permitted to use electric resistance in compliance with Section C404.2.3.4.

#### **Exceptions:**

1. Permits applied for prior to January 1, 2022.
2. Buildings with combined water heating capacity of less than 21 kW and no greater than 120 gallons of total hot water storage capacity are permitted to utilize electric resistance water heating equipment.
3. Point-of-use instantaneous electric water heaters, serving fixtures no more than 8 feet of developed pipe length from the water heater, are permitted and do not contribute to the building combined water heating capacity calculation for Exception 2.
4. Solar thermal, wastewater heat recovery, other approved waste heat recovery, ground source heat pump, water-source heat pump system utilizing waste heat, and combinations thereof, are permitted to offset all or any portion of the required HPWH capacity where such systems comply with this code and the Seattle Plumbing Code.

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3.5. Systems meeting the requirements of the Northwest Energy Efficiency Alliance (NEEA) Advanced Water Heater Specifications for central service water heating systems.

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**TABLE C406.1  
EFFICIENCY PACKAGE CREDITS**

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
...(remainder of table unchanged)						
8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4.0 <u>NA after 1/1/2022</u>	5.0 <u>NA after 1/1/2022</u>	NA	NA	NA	8.0 <u>NA after 1/1/2022</u>

\* \* \*

**C406.8 Reduced energy use in service water heating.** Buildings with service hot water heating equipment that serves the whole building, building *addition* or tenant space shall comply with Sections C406.8.1 and C406.8.2. No service water heating systems incorporating fossil fuel-fired equipment, or heat from district energy systems that are primarily heated by fossil fuel combustion, are permitted to utilize this credit. After January 1, 2022, buildings subject to the requirements of Section C404.2.3 are not permitted to utilize this credit.

**C406.8.1 Building type.** Not less than 90 percent of the *conditioned floor area* of the whole building, building area, occupancy type, building *addition* or tenant space shall be of the following types:

1. Group R-1: Boarding houses, hotels or motels. ~~(Not applicable after 1/1/2022)~~
2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.
3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.
4. Group F: Laundries.
5. Group R-2. ~~(Not applicable after 1/1/2022)~~
6. Group A-3: Health clubs and spas.
7. Buildings with a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407 or as shown through alternate service hot water load calculations showing a minimum service water energy use of 15 k/Btu per square foot per year, as *approved* by the building official.