STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Jan 2022

Log No. 24-GP1-138 Revision
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Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # _C401.2, 401.3, 403.1.4, 404.2.1, 406.2, 503.4.7, 503.5, _____

Brief Description: Strike Section C401.3 Fossil Fuel Path and related sections in their entirety.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

C401.2 Application. Commercial buildings shall comply ~~with the fossil fuel compliance path according to Section C401.3, or~~ with one of the following~~:~~

~~**C401.3 Fossil fuel compliance path.** Buildings complying with the fossil fuel compliance path shall comply with the prescriptive compliance path of this code as defined in Item 1 of Section C401.2, and as modified by this Section C401.3.~~

~~**C401.3.1 Modification of code requirements.** For use of this compliance path only, the following changes shall be made to this code:~~

~~1. **Section C403.1.4 - Space heating.** Strike the phrase "...or fossil fuel combustion..." from the first sentence of Section C403.1.4.~~

~~2. **Section C404.2.1 - Service water heating.** Revise the first sentence of Section C404.2.1 to read: "Service hot water shall be provided by fossil fuel water heating equipment, electric air-source heat pump water heating equipment, electric resistance water heating equipment, or a combination of these equipment types meeting the requirements of this section."~~

~~3. **Section C406.2.5 - Renewable energy.** When determining renewable energy credits in Equation 4-17 of Section C406.2.5, strike the phrase "...limited to 50 percent of the required credits in Section C406.1"~~
~~in the definition of the factor AEC_{RRa}.~~

~~4. **Table C406.2 - Efficiency measure credits.** Use Table C406.2(2) credit values in place of Table C406.2(1) credit values.~~

~~**C401.3.2 Fossil fuel equipment.** Fossil fuel combustion appliances are permitted for HVAC heating, and shall comply with the applicable efficiency standards referenced in Section C403.3.3.2. Fossil fuel combustion appliances are permitted for service water heating, and shall comply with applicable efficiency standards referenced in Table C404.2.~~

~~**C401.3.3 Additional efficiency credits.** The number of additional efficiency credits required by Table C406.1 shall be increased by the number required in Table C401.3.3, modified as permitted in this section, and is in addition to the energy efficiency credits and load management credits required by Section C406.~~

~~**Exception:** The required number of space heating additional efficiency credits are permitted to be reduced in the following instances:~~

1. Low energy spaces in accordance with Section C402.1.1.1 and equipment buildings in accordance with Section C402.1.2 that are served by space heating systems shall comply with sufficient measures from Table C406.2(1) or Table C406.2(2) to achieve a minimum of 50 percent of the efficiency credits required for new construction by Table C401.3.3, modified as permitted in this section.

2. Building additions that have less than 1,000 square feet of conditioned floor area and that comply with sufficient measures from Table C406.2(1) or Table C406.2(2) to achieve a minimum of 50 percent of the additional efficiency credits required for additions by Table C401.3.3, modified as permitted in this section.

3. Semi-heated spaces in accordance with Section C402.1.1.2 that comply with sufficient measures from Table C406.2(1) or Table C406.2(2) to achieve a minimum of 50 percent of the space heating additional efficiency credits required by Table C401.3.3, modified as permitted in this section.

4. Unconditioned spaces, open parking garages and unheated enclosed parking garages are not required to achieve the additional efficiency credits for space heating required by Table C401.3.3.

TABLE C401.3.3
ADDITIONAL CREDITS REQUIRED

C401.3.3.1 HVAC credit modification. The number of HVAC heating energy efficiency credits required by Table C401.3.3 is permitted to be decreased according to Equation 4-1:

$$CR = A \times (C - B)/D \quad \text{(Equation 4-1)}$$

Where:

CR = Additional credits required, rounded to the nearest whole number
A = Baseline HVAC credits from Table C401.3.3
B = Installed fossil fuel space heating capacity in kBTU/h of appliances that comply with any of the exceptions to Section C403.1.4
C = Total installed fossil fuel space heating capacity in kBTU/h of all HVAC heating appliances
D = Total capacity in kBTU/h of all types of space heating appliances

C401.3.3.2 Service water heating credit modification. The number of service water heating energy efficiency credits required by Table C401.3.3 is permitted to be decreased according to Equation 4-2

$$CR = A \times (C-B)/D$$

Where:

CR = Additional credits required, rounded to the nearest whole number
A = Baseline credits from Table C401.3.3.
B = Installed service water heating appliances capacity in kBTU/h of service water heating appliances that comply with any of the exceptions to Section C404.2.1.

C = Total installed fossil fuel service water heating capacity in kBTU/h of all service water heating appliances

D = Total capacity in kBTU/h of all types of service water heating appliances.

C401.3.4 Renewable energy credit limit. No more than 80 percent of the efficiency credits required by Sections C401.3.3.1 and C401.3.3.2 are permitted to be renewable energy credits defined in Section C406.2.5.

C401.3.5 Discrete area-weighting of additional required credits. In addition to the area-weighted credit requirements in Section C406.1.2, where a building includes multiple occupancies, the additional required credits per Table C401.3.3 shall be determined separately for each occupancy group. Additional required credits shall be prorated on an area-weighted basis for each occupancy group in the same manner as
required project credits per Section C406.1.

1. Where a single space heating or service water heating system serves multiple occupancies, the number of additional required credits shall be prorated on an area-weighted basis for each occupancy served.
2. Additional required credits for envelope systems shall be prorated on an area-weighted basis for all occupancies.
3. Occupancies are permitted to be subdivided into discrete areas, with required and achieved credits for each area prorated on an area-weighted basis as required for the occupancy group.

C401.3.6 Electrification readiness. Additionally, the following provisions shall be required for new construction for each fossil fuel space heating or service water heating appliance installed:

1. Provide a spare electrical branch circuit conduit to the location of a future replacement heat pump appliance to support an equivalent heating capacity.
2. Provide spare electrical service entrance conduits for the purpose of upgrading the main electrical service to support all heat pump appliances throughout the building.
3. The main electrical room has sufficient space to accommodate increasing the main electrical service's size to support all heat pump appliances throughout the building.
4. Additional accommodations for the equipment comprised of transformer(s) and other equipment necessary to support an electrical service upgrade. These accommodations shall include adequate space on the site. If the equipment is located in a transformer vault, that vault must include not only the space to support electrical service upgrade but also include accommodations for additional cooling for larger transformer(s).

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.

C404.2.1 Service water heating system type. Service hot water shall be provided by an electric 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 or fossil fuel in compliance with Section C404.2.1.4.

Exceptions:

1. 24 kW plus 0.1 watts per square foot of building area of electric resistance service water heating capacity is allowed per building.

~~2. Solar thermal, wastewater heat recovery, other *approved* waste heat recovery, ground source heat pumps, water-source heat pump systems 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 *Uniform Plumbing Code*.~~
~~3. Systems that comply with the Northwest Energy Efficiency Alliance (NEEA) Commercial Electric Advanced Water Heating Specification.~~
~~4. Service hot water systems served by a district energy system that serves multiple buildings and that was in service before the effective date of this code.~~
~~5. Commercial dishwashers, commercial food service equipment, and other *approved* process equipment are permitted to utilize electric booster heaters for supply water temperatures 120°F (49°C) or higher.~~
~~6. Systems connected to a *low-carbon district energy exchange system* or a *low-carbon district heating and cooling or heating only system*.~~
~~7. Essential facilities. Groups I-2 and I-3 occupancies that by regulation are required to have in place redundant emergency backup systems.~~

C404.2.1.1 ~~Primary~~ ~~h~~Heat pump system sizing Where used, ~~T~~the ~~primary~~ heat pump service water heating system shall be sized to deliver no less than 50 percent of the calculated demand for service hot water production during the peak demand period. Demand shall be calculated using the equipment manufacturer's selection criteria or another *approved* methodology with entering dry bulb or wet bulb outdoor air temperature at 40°F (4°C) for air-source heat pumps, or 44°F (7°C) ground temperature for ground-source heat pumps. Electric air source heat pumps shall also be sized to deliver no less than 25 percent of the calculated demand for service hot water production during the peak demand period when entering dry bulb or wet bulb outdoor air temperature is 24°F (-4°C). The remaining ~~primary~~ service water heating system output may be met by fossil fuel, electric resistance, or heat pump water heating systems.
Exception: Twenty-five percent sizing at entering dry bulb or wet bulb air temperature of 24°F (-4°C) is not required for air-source heat pumps located in a below-grade enclosed parking structure or other ventilated and unconditioned space that is not anticipated to fall below 40°F (4°C) at any time.

C404.2.1.3 Heat pump ~~S~~system design. Where used**,** ~~T~~the heat pump service water heating system shall be configured to conform to one of the following provisions:
1. For *single-pass heat pump water heaters*, *temperature maintenance* heating provided for reheating return water from the building's heated water circulation system shall be physically decoupled from the primary service water heating system storage tank(s) in a manner that prevents destratification of the primary system storage tanks. *Temperature maintenance* heating is permitted to be provided by electric resistance, fossil fuel, or a separate dedicated heat pump system.
2. For *multi-pass heat pump water heaters*, *recirculated temperature* maintenance water is permitted to be returned to the primary water storage tanks for reheating.
3. For unitary heat pump water heaters, located in conditioned space, are permitted, where they are sized to meet all calculated service water heating demand using the heat pump compressor, and not supplementary heat.

~~**C404.2.1.4 Supplemental water heating.** Total supplemental water heating equipment shall not have an output capacity greater than the total summed capacity of all primary water heating equipment. For the purposes of determining this supplemental water heating allowance, the capacity of primary water heating equipment shall be evaluated at 40°F (4°C) entering dry bulb or wet bulb outdoor air temperature for airsource heat pumps, 44°F (7°C) ground temperature for ground-source heat pumps, and at the nameplate input rate for all other water heater system types. Supplemental heating is permitted for the following uses:~~
~~1. *Temperature maintenance* of heated-water circulation systems, physically separate from the primary service water heating system.~~

~~2. Defrost of compressor coils.~~
~~3. Heat tracing of piping for freeze protection or for *temperature maintenance* in lieu of recirculation of hot water.~~
~~4, Backup or low ambient temperature conditions, where all of the following~~
~~4 are true:~~
~~. 4.1. During normal operations, the supplemental heating is controlled to operate only when the~~
~~entering air temperature at the air-source HPWH is below 40°F (4°C), and the primary HPWH compressor continues to operate together with the supplemental heating.~~
~~4.2. The primary water heating equipment cannot satisfy the system load due to equipment failure or entering air temperature below 40°F (4°C).~~

TABLE C406.1
ENERGY MEASURE CREDIT REQUIREMENTS

Required Credits for Projects	Section	Occupancy Group					
		Group R-1	Group R-2	Group B	Group E	Group M	All Other
New building energy efficiency credit requirement	C406.2	~~54~~ 81	~~41~~ 62	~~42~~ 63	~~48~~ 72	~~74~~ 111	~~49~~ 74
Building additions energy efficiency credit requirement	C406.2	~~27~~ 41	~~20~~ 30	~~21~~ 32	~~23~~ 35	~~36~~ 54	~~21~~ 32
New building load management credit requirement	C406.3	~~12~~ 18	~~15~~ 23	~~27~~ 41	~~15~~ 23	~~13~~ 20	~~26~~ 39

C406.2 Additional energy efficiency credit measures. Each energy efficiency credit measure used to meet credit requirements for the project shall include efficiency that is greater than the energy efficiency required for the building type and configuration requirements in Sections C402 through C405. Measures installed in the project that meet the requirements in Sections C406.2.1 through C406.2.14 shall achieve the credits listed for the measure and occupancy group in Table C406.2(1) ~~or Table C406.2(2)~~ or where calculations required by Sections C406.2.1 through C406.2.14 create or modify the table credits, the credits achieved shall be based upon the section calculations.

~~Projects that chose to comply with the fossil fuel pathway in Section C401.3 use gas-fired equipment for either space or water heating shall use Table C406.2(2) to achieve credits~~

TABLE C406.2(1)
EFFICIENCY MEASURE CREDITS
(Retain entire table as is except for the following)

			Occupancy Group					
Measure Title	Applicable Section		Group R-1	Group R-2	Group B	Group E	Group M	Other Al
18. High efficiencyservice waterheating, gas-fired	C406.2.6.4	SWH	~~NA~~ 59	~~NA~~ 65	~~NA~~ 6	~~NA~~ 11	~~NA~~ 18	~~NA~~ 32

~~**TABLE C406.2(2)**~~
~~**EFFICIENCY MEASURE CREDITS FOR USE WITH**~~
~~**FOSSIL FUEL COMPLIANCE PATH**~~ **PROJECTS USING GAS-FIRED EQUIPMENT**
~~(Retain all credit values as shown in the table, except for the following additions for gas heat pumps)~~

C406.2.2.3.2 Heating equipment efficiency. Equipment shall exceed the minimum heating efficiency requirements of the tables in Section C403.3.2 by at least 5 percent. Where equipment exceeds the minimum annual heating efficiency requirements by more than 5 percent, energy efficiency credits for heating shall be determined using Equation 4-17, rounded to the nearest whole number.

(Equation 4-17)

$$EECHEH = EEC5 \times [1 + HEI\text{-}.050 / .05]$$

Where:
EECHEH = Energy efficiency credits for heating efficiency improvement.
EEC5 = Section C406.2.2.2 credits from Table C406.2(1).
HEI = The lesser of the improvement above minimum heating efficiency requirements or ~~20~~ 30 percent (~~0.20~~ 0.30).
Where heating efficiency varies by system, use the capacity weighted average percentage for all heating equipment combined. For metrics that increase as
efficiency increases, HEI shall be calculated as follows:
$HEI = HMDES / HMMIN - 1$
Where:
HMDES = Design heating efficiency metric, part load or annualized where available. Where used, gas heat pumps shall be tested and rated in accordance with CSA/ANSI Z21.40.4 - CSA 2.94 at an outdoor temperature of 17 deg F. HMDES for gas heat pump expressed as a COP. HMMIN expressed as a fraction.
HMMIN = Minimum required heating efficiency metric, part-load or annualized where available from Section C403.3.2.

Exceptions:
~~**1.**~~ In low energy spaces complying with Section C402.1.1 and *semi-heated spaces* complying with Section C402.1.1.2, no less than 90 percent of the installed heating capacity is provided by electric infrared or gas-fired radiant heating equipment for localized heating applications. Such spaces shall achieve credits for EEC5.
~~2. Where gas-fired heat pumps tested and rated in accordance with CSA/ANSI Z21.40.4 - CSA 2.94 are installed, energy efficiency credits for heating shall be determined using Equation 4-XX, rounded to the nearest whole number.~~

~~**(Equation 4-XX)**~~

~~EECHEH = EEC5 x [HEIGHP/HMMMIN]~~

~~Where:~~

~~HEIGHP = Gas heat pump COP as tested and rated in accordance with CSA/ANSI Z21.40.4 - CSA 2.94 at an outdoor air temperature of 47 deg F.~~

C406.2.6.4 High efficiency service water heating, gas-fired. The credit achieved shall be from Table C406.2(2) where hot water is supplied by gas-fired equipment with minimum efficiency of 0.91 UEF.

Exception:
Where gas-fired heat pump water heaters tested and rated in accordance with ANSI/ASHRAE 118.1 are installed, energy efficiency credits for high efficiency service water heating shall be determined using Equation 4-XY, rounded to the nearest whole number.

(Equation 4-XY)

EECSWH = EEC18 x [WHEGHP/.91]

Where:

EECSWH = Energy efficiency credits for service water heating efficiency improvement.
EEC18 = Section C406.2.6.4 credits from Table C406.2(1).
WHEGHP = Gas heat pump water heater COP as tested and rated in accordance with ANSI/ASHRAE 118.1.

C503.4.7 Addition or replacement of heating appliances. Where a mechanical heating appliance is added or replaced, the added or replaced appliance shall comply with ~~Section C401.3, Section C403.1.4, or with an alternate compliance option in Table C503.4.7. Where use of heat pump equipment for space heating is required by this section, it is permissible to utilize the Fossil Fuel Compliance Path in Section C401.3 to attain the credits required for building additions shown in Table C401.3.3.~~Section C403.
Exceptions:
1. Terminal unit equipment including, but not limited to, hydronic VAV boxes, electric resistance VAV boxes, electric duct heaters, water source heat pumps, fan coils, or VRF indoor units that are served by an unaltered central system.
2. Air handling equipment with hydronic coils.
3. Air handling equipment designed for 100 percent outdoor air that is not subject to the requirements in Section C403.3.5 or that qualifies for an exception to Section C403.3.5.
4. Replacement of existing oil-fired boilers.
5. Replacement of existing steam boilers with steam distribution to terminal units and the associated boiler feed equipment.
6. Where compliance with Section C403.1.4 would trigger an unplanned utility electrical service upgrade based on the NEC 220.87 method for determining existing loads.
7. Replacement of heating equipment with equipment that is the same type as where the rated capacity of the new equipment does not exceed the rated capacity of the existing equipment

TABLE C503.4.~~7~~6
COMPLIANCE OPTIONS FOR MECHANICAL HEATING EQUIPMENT ALTERATIONS
(~~Strike the entire~~ Retain table)

C503.5 Service water heating equipment. All new service water heating systems, equipment, and components of existing systems that are altered or replaced shall comply with Section C407 or Sections C404, C408.3, C501.6, and C506.1. Additions or alterations shall not be made to an existing service water heating system that will cause the existing system to become out of compliance. ~~Where use of heat pump equipment for service water heating is required by this section, it is permissible to~~

~~utilize the Fossil Fuel Compliance Path in Section C401.3 to attain the credits required for building additions shown in Table C401.3.3.~~

Exceptions:

~~1. 1.The following equipment is not required to comply with Section C401.3 or Section C404.2.1, as applicable:~~

~~1.1~~. 1. Replacement of service water heating appliances with equipment that is the same type and has the same or higher efficiency and the same or lower capacity, provided there are no other alterations made to the existing service water heating system size or configuration.

~~1.2~~. 2. Replacement of any of the following water heater appliances:

~~1.2.1~~.2.1 Electric water heaters with an input of 12 kW or less.

~~1.2.~~2.2.2 Gas storage water heaters with an input of 75,000 Btu/h or less.

~~1.2.3~~.2.3 Gas instantaneous water heaters with an input of 200,000 Btu/h or less and 2 gallons or less of storage.

~~1.3.~~ 3. Where it has been determined by the code official that existing building constraints including, but not limited to, available floor space or ceiling height, limitations of the existing structure, or electrical service capacity, make compliance technically infeasible.

~~2.~~ 4. Systems included in Section C403.5 that serve individual dwelling units and sleeping units

Purpose of code change:

The purpose of this code change is to bring the WSEC-C into compliance with RCW 19.27A.020 (3) that states, "The Washington state energy code may not in any way prohibit, penalize, or discourage the use of gas for any form of heating, or for uses related to any appliance or equipment, in any building."

The current requirements in the Fossil Fuel Path requiring 2X to 7X more credits clearly violate this section and therefore must be struck to come into compliance with the law.

Your amendment must meet one of the following criteria. Select at least one:

- ☐ Addresses a critical life/safety need.
- ☐ The amendment clarifies the intent or application of the code.
- ☐ Addresses a specific state policy or statute. (Note that energy conservation is a state policy)
- ☒ Consistency with state or federal regulations.
- ☐ Addresses a unique character of the state.
- ☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

- ☐ Single family/duplex/townhome
- ☐ Multi-family 1 – 3 stories
- ☒ Multi-family 4 + stories
- ☒ Commercial / Retail
- ☒ Institutional
- ☐ Industrial

Your name	Gary Heikkinen	Other contact name	Click here to enter text.
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Economic Impact Data Sheet

Is there an economic impact: ☒ Yes ☐ No

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants, and businesses. If you answered "No" above, explain your reasoning.

This change will result in decreased costs for construction by eliminating the requirement for 2X to 7X more credits for the Fossil Fuel Path.

Provide your best estimate of the **construction cost** (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$Click here to enter text./square foot (For residential projects, also provide $Click here to enter text./ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

Provide your best estimate of the **annual energy savings** (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

Each credit in Section C406 of the IECC is worth 0.1% energy savings. Therefore, 50 credits = 5% savings.

List any **code enforcement** time for additional plan review or inspections that your proposal will require, in hours per permit application:

This change will reduce the amount of time spent for code enforcement.

Small Business Impact. Describe economic impacts to small businesses:

Decreasing cost of construction should provide a positive benefit to small businesses.

Housing Affordability. Describe economic impacts on housing affordability:

Does not affect housing affordability.

Other. Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Instructions: Send this form as an email attachment, along with any other documentation available, to: sbcc@des.wa.gov. For further information, call the State Building Code Council at 360-407-9255.

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.