STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Jan 2022

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Received 5/19/25

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C406_____

Brief Description: Add C406 options for gas-fired heat pumps for space and water heating.

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.)

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 4-16, rounded to the nearest whole number.

C406.2.2.3.2.1 Gas-fired heat pumps. Equipment shall be tested and rated in accordance with ANSI Z21.40.4-CSA 2.94.

(Equation 4-16)

$$EEC_{HEH} = EEC_5 \times [1 + HEI—0.05/0.05]$$

Where:

EEC_{HEH} = Energy efficiency credits for heating efficiency improvement.

EEC_5 = Section C406.2.X.X credits from Table C406.2(X).

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:

$HEI = HM_{DES}/HM_{MIN} - 1$

Where:

HM_{DES} = Design heating efficiency metric, partload or annualized where available. For gas-fired heat pumps, the heating efficiency shall be at an outdoor air temperature of 17° F as tested and rated in accordance ANSI Z21.40.4-CSA 2.94.

HM_{MIN} = Minimum required heating efficiency metric, part-load or annualized where available from Section C403.3.2

Exception: 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 EEC_5.

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

C406.2.6.4.1 Gas-fired heat pump water heaters. Where the efficiency of a gas-fired heat pump water heater exceeds a COP of 1.0 as tested and rated in accordance with ASHRAE 118.1 at 50 deg F air temperature, the credit achieved shall be determined using Equation 4-XX, rounded to the nearest whole number.

Equation 4-XX

$$EEC_{GHP} = EEC_{HEW} \times (COP_{GHP}/1.0)$$

Where:

EEC_{GHP} = Energy efficiency credits earned for gas-fired heat pump water heater

EEC_{HEW} = Energy efficiency credits for high efficiency service water heating, gas-fired from Table C406.2(X)

COP_{GHP} = efficiency (COP) of gas-fired heat pump water heater

Purpose of code change:

This proposal adds more high efficiency options to the additional efficiency measures section C406 in the WSEC-C.

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

Your organization Energy Consultant on behalf of NW Natural

Other contact name	Click here to enter text.	Phone number	503-997-9334
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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.

All additional energy efficiency measures increase the cost of construction.

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?

Gas-fired heat pumps for space and water heating will be 30-50% more efficient than minimum efficiency gas space and water heating equipment.

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

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

Hard to estimate additional code enforcement time, but anticipate there will be additional time required as code officials come up to speed with the new technology.

Small Business Impact. Describe economic impacts to small businesses:

Since these will be optional, small businesses can make their own decisions on whether to include the use of this technology.

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:

Gas-fired heat pumps will also result in 30-50% carbon emissions reductions as compared to standard gas-fired equipment.

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.