MVE Committee
Summary of Proposed Modifications
2021 Code Adoption Cycle
Sept/Oct 2022

Res Energy Code Testimony

Testimony From	Summary
Minority Reports	
052/051/070	Electricity metric to 0.8 or remove fuel normalization table
065	Do not adopt HP space heating
066	Do not adopt HP water heating
073/051	Remove the fuel normalization table
080	Do not adopt or modify to add an exception for WH with an efficiency of not less than 1.15 COP
Steve Tapio (Oral testimony, Sept. 29)	The Council should reconsider the ERI Proposal (097) and allow it as an alternate compliance path
Dave Baylon	In Option 2 of R406 add 1.5 points to all dwelling types 1. Small dwelling unit……~~2.5~~4.0 credits 2. Medium dwelling unit ……~~5.0~~6.5 Credits 3. Large Dwelling unit ……~~6.0~~7.5 Credits 4. Group R-2 Dwelling Units ……~~4.5~~6.0 Credits 5. Additions ……~~2.0~~3.5 credits 150 square feet to 500 square feet

<table>
<tr><th>Testimony From</th><th>Summary</th></tr>
<tr><td>Andrea Smith
BIAW</td><td>Send R406 Options 5.1 and 5.2 to the Plumbing TAG for review before adoption
Add HSPF2 and SEER2 efficiency rating crosswalk
Define Primary Living Space
Add an appendix with alternates for non-compliance with R406 credits
Add an additional dwelling unit size between medium and large
Change the air leakage to 4 ACH and add a credit option for 3 ACH
Do not require HRV in Options 2.1, 2.2 and 2.3
Remove Option 3.1 in R406 Option 2
Retain Option 4.2 in R406 Option 2
Remove Option 3.6 (R406 Option 1)/3.7 (R406 Option 2) as they don’t make sense
Allow water heater/sealed air handler in semi-conditioned spaces (garage)</td></tr>
<tr><td>Paul Rozenberg</td><td>Modify 065/066 to allow technology-neutral carbon reduction and permit other fuels such as propane</td></tr>
<tr><td>Chuck Murray</td><td>Change the leakage rate in Table R405.4.2(1) to match the required leakage rate in the prescriptive code
WAC 51-11R-40551 Table ((~~R405.5.2(1)~~)) R405.4.2(1)— Specifications for the standard reference and proposed designs.
TABLE ((~~R405.5.2(1)~~)) R402.4.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS
<table><tr><td>Air exchange rate</td><td>Air leakage rate of ~~5~~ 3 air changes per hour at a pressure of 0.2 inches w.g. (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 × CFA +7.5 × (N_{br} + 1)
where:
CFA = conditioned floor area
N_{br} = number of bedrooms
- The mechanical ventilation system type shall be the same as in the proposed design. Energy recovery shall not be assumed for mechanical ventilation.</td><td>As proposed[a]. The mechanical ventilation rate[b] shall be in addition to the air leakage rate and shall be as proposed.</td></tr></table></td></tr>
<tr><td>Craig Olson</td><td>Delay the adoption date for the heat pump proposals</td></tr>
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WA ACCA	Add a crosswalk for the HPSF2 efficiency rating Address the L&I rules for electricians Add an appendix with alternates for non-compliance with R406 credits
Lorna Luebbe **PSE**	Adjust the natural gas metric
Dan Kirchner **NWGA**	Adjust the natural gas metric
Kjell Anderson	I have a two minor comments to clarify and clean up language: • To clarify what is meant by primary living spaces, add to footnote a to R406.3. "primary living areas include living, dining, kitchen, bedrooms, family rooms, and similar areas." • In Section R406 tables…we need to clean up the language to use back-up, secondary or supplemental but not all interchangeably. This includes changing table R406.2 option 2 from secondary to supplemental as well as some other editorial changes.
Kevin Duell **NW Natural**	Do not adopt R403.58.5 on water heater installation location, or modify to add an exception for WH with an efficiency of not less than 1.15 COP **Proposed Code Language** R403.5.5 Water heater installation location. Service hot water systems shall be installed within the building thermal envelope. EXCEPTIONS: 1. Where the hot water system efficiency is greater than or equal to 2.0 UEF. 2. Gas heat pumps with an efficiency greater than or equal to 1.15 UEF.
Kevin Duell **NW Natural**	Table R406.3, OPTION 1 and 2 in the CR02 both provide credits for gas high-efficiency furnaces and boilers, yet Proposal 21-GP3-065 does not allow them. This proposal seeks to correct that by adding another exception (in bold and underlined below) that resolves this inconsistency. **Proposed Code Language** **R403.13 Heat pump space heating.** Space heating shall be provided by a heat pump system. Exceptions:

Testimony From	Summary
	1. Detached one- and two-family dwellings and multiple-single family dwellings (townhouses up to three stories in height above grade having an installed HVAC heating capacity no greater than 1.5 watts of electric resistance heating per square foot of dwelling unit conditioned floor area, or up to 500 watts, whichever is greater. 2. Group R-2 dwelling or sleeping units having an installed HVAC heating capacity no greater than 750 watts in Climate Zone 4, and 1,000 watts in Climate Zone 5, in any separate habitable room with exterior fenestration are permitted to be heated using electric resistance appliances. Four buildings in location with exterior design conditions below 4°F (-15.6°C), an additional 250 watts above that allowed for Climate Zone 5 is permitted. 2.1. 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 not greater than 1,000 watts in Climate Zone 4, and 1,300 watts in Climate Zone 5. Bay windows and other minor offsets are not considered primary walls. For buildings in location with exterior design conditions below 4°F (-15.6°C), an additional 250 watts above that allowed for Climate Zone 5 is permitted. 3. Resistance heating elements integrated into heat pump equipment. 4. Solar thermal systems. 5. Waste heat, radiant heat exchanger, and energy recovery systems. 6. Supplementary heat in accordance with Section R403.1.2. 7. Where there is no electric utility service available at the building site. 8. Heating systems that rely primarily on biomass are allowed in Climate Zone 5. 9. Gas or propane furnaces or gas or propane boilers from Table 406.3, Energy Credits.
Kevin Duell **NW Natural**	• Proposal 21-GP2-063 – To remain consistent with nationwide and international standards, maintain the previous table for minimum kitchen exhaust rates and delete the exhaust rates proposed in IMC – Table R403.4.7.3 and IRC – Table M1505.4.4.3. • Proposal 21-GP2-065 – For consistency, add an exemption under R403.13 for gas or propane furnaces or gas or propane boilers from Table 406.3, Energy Credits. This aligns with Table R406.3, Option 1 and 2, which both provide credits for high-efficiency gas furnaces and boilers. • Proposal 21-GP2-066 – For consistency, add an exemption under R403.5.7 for gas or propane water heaters from Table 406.3, Energy Credits. This aligns with Table R406.3, Option 1, provides credits for high-efficiency gas water heaters. • Proposal 21-GP2-067 – To advance energy efficiency, appliance affordability, and energy reliability, amend Table R406.3 to include energy credits for gas-fired heat pumps. • Proposal 21-GP2-069 – To advance energy efficiency, appliance affordability, and energy reliability, amend Table R406.3 to include energy credits for gas-fired heat pumps.

Testimony From	Summary
	• Additionally, NW Natural urges the Council to amend the emission factor for gas to be 10.53 lb CO2e/therm in Table R405.2(2), which reflects the greenhouse gas emission reductions that will occur in the gas sector as a result of the Climate Commitment Act.
Kevin Duell **NW Natural**	Table R406.3, OPTION 1 in the CR02 provides credits for high-efficiency gas water heaters, yet Proposal 21- GP3-066 does not allow them. This proposal seeks to correct that inconsistency by adding another exception (in bold and underline below). Proposed Code Language – Based on Table R406.3, OPTION 1 **R403.5.7 Heat pump water heating.** Service hot water in one- and two family dwellings and multiple single-family dwellings (townhouses) shall be provided by a heat pump system. The heat pump water heating system shall be sized to provide 100 percent of peak hot water demand. Where the heat pump is located in unconditioned space, the heat pump water heating system shall be sized to provide 100 percent of peak hot water demand at an entering source dry bulb (or wet bulb if rated for wet bulb temperatures) air temperature of 40°F (4°C). EXCEPTIONS: 1. Resistance heating elements integrated into heat pump equipment. 2. Electric water heaters with a rated water storage volume of no greater than 20 gallons. 3. Dwelling units with no more than 1,000 square feet of conditioned floor area. 4. Supplementary water heating systems in accordance with Section R403.5.7.1, provided the system capacity does not exceed the capacity of the heat pump water heating system. 5. Solar water heating systems. 6. Waste heat and energy recovery systems. 7. Heat trace freeze protection systems. 8. Snow and ice melt systems. 9. Gas or propane water heaters from Table 406.3, Energy Credits.
Kevin Duell **NW Natural**	The WSEC-R TAG voted down Proposal 21-GP2-067 over concerns about the basis for energy savings, because there is no federal minimum efficiency for gas heat pumps (GHPs) – as of yet. However, there are federal standards for gas water heaters and gas furnaces that do serve as a solid basis for evaluating energy savings. This proposal includes a minimum gas-fired heat pump (GHP) efficiency that would help effectuate the goal of Washington's building codes to encourage efficiency while retaining energy source neutrality. The intent of the original proposal was to provide energy credits for GHP. Proposals 065 and 066 allow the use of GHPs for space and water heating. This equipment has up to 50% (or more) greater efficiency than federal minimum equipment, therefore it only makes sense that credit should be given. The purpose of this proposed code change is to advance energy efficiency with existing products on the market, to promote advanced gas equipment and to broaden options for builders and owners.

Testimony From	Summary
	The point values would need to be validated by the third party that provided the energy modeling for Table R406.3 in the CR102. The proposed changes below are in bold and underlined.

OPTION	DESCRIPTION	CREDIT(S)		
		All Other		Group R-2[b]
		Table R406.2 System Type 1, 2, 3	Table R406.2 System Type 4, 5	Any
5. EFFICIENT WATER HEATING OPTIONS Only one option from Items 5.3 through ~~5.6~~5.9 may be selected in this category. Items 5.1 and 5.2 may be combined with any option.				
5.7	Water heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. Or For R-2 Occupancy, gas-fired heat pump water heater(s) meeting the standards for NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. shall supply domestic hot water to all units. or For R-2 Occupancy, gas-fired heat pump water heater(s) meeting ANSI Z21.40.2 and Z21.40.4 or CSA, with a minimum UEF of 1.15, shall supply domestic hot water to all units. To qualify to claim this credit, the building permit drawings shall specify the option being selected and shall specify the water heater equipment	2.0	2.0	2.5

			type and the minimum equipment efficiency and, for solar water heating systems, the calculation of the minimum energy savings.				
		5.8	Combination water heating and space heating system shall include one of the following: A gas-fired water heater/boiler with a minimum UEF of 0.91 or For R-2 Occupancy, gas-fired water heater(s)/boiler(s) with a minimum UEF of 0.91 shall supply all units. To qualify to claim this credit, the building permit drawings shall specify the option being selected and shall specify the water heater equipment type and the minimum equipment efficiency and, for solar water heating systems, the calculation of the minimum energy savings.	**1.5**	**1.5**	**1.5**	
		5.9	Combination water heating and space heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. or	**2.0**	**2.0**	**2.5**	

Testimony From	Summary
	For R-2 Occupancy, gas-fired heat pump water heater(s) meeting the standards for NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. shall supply all units. or For R-2 Occupancy, gas-fired heat pump(s) meeting ANSI Z21.40.2 and Z21.40.4 or CSA, with a minimum UEF of 1.15, shall supply all units. To qualify to claim this credit, the building permit drawings shall specify the option being selected and shall specify the water heater equipment type and the minimum equipment efficiency and, for solar water heating systems, the calculation of the minimum energy savings. Chapter 6, Reference Standards add: NEEA-2019 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters, Vers. 1.0 Section R403.5
Kevin Duell **NW Natural**	The WSEC-R TAG voted down proposal 21-GP2-069 over concerns about the basis for energy savings, because there is no federal minimum efficiency for gas heat pumps (GHPs) – as of yet. However, there are federal standards for gas water heaters and gas furnaces that do serve as a solid basis for evaluating energy savings. This proposal includes a minimum gas-fired heat pump (GHP) efficiency that would help effectuate the goal of Washington's building codes to encourage efficiency while retaining energy source neutrality. The intent of the original proposal was to provide energy credits for GHP. Proposals 065 and 066 allow the use of GHPs for space and water heating. This equipment has up to 50% (or more) greater efficiency than federal minimum equipment, therefore it only makes sense that credit should be given. The purpose of this proposed code change is to advance energy

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	efficiency with existing products on the market, to promote advanced gas equipment and to broaden options for builders and owners. The point values would need to be validated by the third party that provided the energy modeling for Table R406.3 in the CR102. The proposed changes below are in bold and underlined.

OPTION	DESCRIPTION	CREDIT(S)		
		All Other		Group R-2[b]
		Table R406.2 System Type 1, 2, 3	Table R406.2 System Type 4, 5	Any
3. HIGH EFFICIENCY HVAC EQUIPMENT OPTIONS Only one option from Items 3.1 through ~~3.6~~**3.9** may be selected in this category.				
3.7	For R-2 Occupancy, gas-fired heat pump(s) meeting ANSI Z21.40.2 and Z21.40.4 or CSA, with a minimum UEF of 1.15, shall supply all units	--	--	**2.0**
3.8	Combination water heating and space heating system shall include one of the following: A gas-fired water heater/boiler with a minimum UEF of 0.91 or For R-2 Occupancy, gas-fired water heater(s)/boiler(s) with a minimum UEF of 0.91 shall supply all units. To qualify to claim this credit, the building permit drawings shall specify the option being selected and shall specify the water heater equipment type and the minimum equipment efficiency and, for solar water heating systems, the calculation of the minimum energy savings.	**1.5**	**1.5**	**1.5**

Testimony From	Summary					
		3.9	Combination water heating and space heating system shall include one of the following: Gas-fired heat pump water heater(s) meeting NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. or For R-2 Occupancy, gas-fired heat pump water heater(s) meeting the standards for NEEA's Tier 2.0 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters Version 1.0. shall supply all units. or For R-2 Occupancy, gas-fired heat pump(s) meeting ANSI Z21.40.2 and Z21.40.4 or CSA, with a minimum UEF of 1.15, shall supply all units. To qualify to claim this credit, the building permit drawings shall specify the option being selected and shall specify the water heater equipment type and the minimum equipment efficiency and, for solar water heating systems, the calculation of the minimum energy savings.	**2.0**	**2.0**	**2.5**	
	Chapter 6, Reference Standards add: ANSI						

Testimony From	Summary
	Z21.40.2-1996 Gas-Fired, Work Activated Air-Conditioning and Heat Pump Appliances (Internal Combustion) Table R406.3 **Z21.40.4-1996 Performance Testing And Rating Of Gas-Fired, Air Conditioning And Heat Pump Appliances Table R406.3** NEEA **NEEA-2019 Advanced Water Heating Specification for Gas-Fueled Residential Storage Water Heaters, Vers. 1.0 Section R403.5**

Mechanical Code Testimony

Testimony From	Summary
Andrea Smith **BIAW**	21-GP2-062 AND 21-GP2-063: INCREASED RANGE HOOD VENTILATION Recommended Technical Modifications: Recommend 160 cfm across all range hoods, not dependent on fuel type of range.
Larry Andrews (Oral testimony, Sept. 30)	Do not adopt the requirement for MERV 13 filters or add an exception for F300 electric air cleaners
Randall Cooper **AHAM** (Oral testimony, Sept. 30)	Add AHAM as an alternate listing source for compliant exhaust hoods
Eric Vander Mey **Rushing**	Clarify the requirements for utility transformer exhaust locations. Referring to the NFPA 70 is not clear and enforceable code language as this section is in regard to naturally ventilated transformer vaults. **Proposed Modifications to the Code Language below in red:** 501.3.1 Location of Exhaust Outlet. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

Testimony From	Summary
	6. For transformer vault exhaust system outlets~~, in addition to the requirements of~~ subject to the requirements of NFPA 70 Section 450.45: 10 feet (3048 mm) from fire escapes, required means of egress at the exterior of the building, elements of exit discharge, exterior combustible materials, openings that are not protected in accordance with IBC Section 705.8; 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above any walking walkway.
Caroline Traube	Regarding the currently open Group 2 public comment, please ensure the inclusion and adoption of the recently published ASHRAE Standard 15.2 in the 2021 Washington State Mechanical Code and the 2021 Washington State Residential Code to align with HB1050.
Ian Casey **NW natural**	**Proposed Code Language – Based on IMC Table 403.4.7.3** Delete proposed Table 403.4.7.3 and instead reference previous table for minimum exhaust rates, (Table 403.4.7)