

# WA Residential Energy Code Change Proposals

## Recommended Talking Points

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011 R402.1.2.4 R-value computation – *editorial*

Stance: Support

- Eliminates redundancy in the code language.

012 Table R402.4.1.1 Insulation in unconditioned spaces – *editorial*

Stance: Support

- Adds clarity to code language.

013 R403.5.2 Demand recirculation water systems – *editorial*

Stance: Support

- Adds clarity to code language.

014 R403.5.3 Drain water heat recovery – *editorial*

Stance: Support

- Adds clarity to code language.

015 – R403.12 – *editorial*

Stance: Support

- Adds clarity to code language.

022 – R406 – *Allows simulated performance methods to be used in lieu of the prescriptive code.*

Stance: Support

- Allow builders the flexibility to showcase expertise in building performance by allowing them the design freedom to choose materials and appliances that best work for their buyers (and their buyers' pocketbooks).
- Code as currently written is misleading because many builders do not believe they have the option to show energy savings using methods other than the prescriptive pathway that is outlined in the section and table within R406.
- Has the capability of saving builders (and home buyers) money because it allows builders to design homes with energy efficiency and cost in mind. This allows them to find a balance between the two variables and doesn't artificially increase costs associated with high-performance homes.
- Example: Builders that have built high-performing homes prior to the 2018 Energy Code and after have reported an increase in costs due to the requirements for compliance outlined in R406.

- Builders I've discussed this common issue with build and often certify homes with the following programs: HERS, ERI, NGBS, Built Green, etc. Certifications they typically invest in include DOE's Zero Energy Ready Home Program, NGBS Green Certification, EPA's Indoor airPLUS, etc.
- One net-zero builder estimates it would save him close to \$20,000 if he didn't have to comply with Section R406.
- Should alleviate local enforcement stresses as simulated performance method results are backed by software and/or third-party consultants.
- I'm currently aware of half a dozen jurisdictions that don't enforce the 2018 Energy Code and have instead created their own mechanisms for allowing Simulated Performance Alternatives.

**Bottom-line:** Our members want to build efficient, healthy, and happy homes. As currently written, the Energy Code holds them back from achieving this goal and mandates certain items that do nothing to improve these already high-performing homes but arbitrarily increase costs.

#### 023 – R406.3, Option 3.2 – *Allows lower HSPF for cold climate central heat pumps for earning credit*

##### Stance: Support

- Allows 9.0 HSPF cold climate heat pumps to be used.
- Great option for areas with harsh winters and eliminates the need for supplemental heat.

#### 024 – R406.3, Option 3.5 – *Allows lower HSPF for cold climate central heat pumps for earning credit*

##### Stance: Support

- Allows 10.0 HSPF cold climate heat pumps to be used.
- Great option for areas with harsh winters and eliminates the need for supplemental heat.

#### 025 – R406.3, Option 3.6 – *Allows 9 HSPF in smaller multi-zone mini-split systems for earning credit*

##### Stance: Support

- Fixes the issue of using oversized equipment for smaller homes just to meet the current 10 HSPF requirement.
- Maintains energy efficiency while also balancing costs.

#### 032 R403.3.2.1 – *requires air handlers to be placed in the conditioned space*

##### Stance: Opposed

- Air handlers are loud. Residents of homes with air handlers located in the conditioned space (not the garage) complain about noise generated – according to Bosch's customer feedback.
- Loud systems impact indoor air quality and can reduce performance for people who work in the home or children completing homework in the home.

- Air handler technology (rather condenser technology as most of the noise comes from this part of the heat pump system) needs improvements for noise reduction before this is required.
- Physically locating air handlers and compressors in separate areas can potentially mitigate noise pollution. Alternatively, the area can also be insulated further to lower noise emitted and reduce thermal losses. Variable speed is also useful for this purpose.
- As we require more air changes and increased filtration, the system works harder to move air and reduces the energy efficiency of the system.

**033 R401.3 – Certificate** – *adds WSU’s Energy Program Certificate as an option for building code officials to require*

**Stance: Support**

- Not required, just optional

**034** – *Optional 0.5 energy credit for high-efficiency HVAC equipment with the use of a connected Smart Thermostat.*

**Stance: Support**

- Options are always great to help inch closer towards compliance.
- Relatively inexpensive (most expensive option on EnergyStar’s list is \$250) for half a credit earned – more bang for the homeowner’s buck.
- Simple payback of four years is a no-brainer.

**035 – R502** – *Exemption for additions in meeting credit requirements of the energy code*

**Stance: Support**

- If an undue burden is present when adding an addition (costs due to structural constraints, in-the-field install issues, or other requirements with no real benefit) if approved by the AHJ.
- Can help improve the affordability of additions that can be used as additional housing units (ADU).

**036 – R503** – *Adds energy efficiency measures to alternations of a large remodel.*

**Stance: Opposed**

- Adds cost to remodeling projects due to air leakage testing and ventilation services/alternations. If it goes above thresholds, concerned about the cost to fix such issues. If no requirement to fix, it’s a waste of money.
- Adds cost to remodeling projects by requiring projects to achieve 1.5 credits from R406.3. Each of the options presented appears relatively easy to comply with however older homes may require more work and money to meet this increase in stringency.
- Bottom-line: More homeowners will forego renovations because they’ve become too costly. This doesn’t help the energy efficiency goals at all and traps these people in potentially unhabitable homes or homes with deferred maintenance.



037 A103, A1034 – *editorial*

**Stance: Support**

- Provides guidance for default values for insulated concrete form assemblies in above and below-grade walls and slabs.
- Provides RTF-approved default U-values for ICF assemblies consistent with utility rebate programs for new construction.

045 R403.5 R408 – *Built Green certification added to alternate compliance path*

**Stance: Support**

- Alternate pathway so this is optional for builders.
- Built Green certifications are widely used by green builders in Washington and are a more stringent option to follow than the prescriptive pathway in the energy code.
- This program goes above energy efficiency and includes other building performance factors like site and water conservation, indoor air quality, and other areas that make homes healthier and more sustainable.

046 R403.5 Water Volume Determination – *water volume determination description added to code*

**Stance: Support**

- Adds description for determining water volume to residential energy code (already exists in commercial energy code).
- Does not increase stringency in requirements.

047 – R406.3, Option 5.6 – *Credit for efficient hot water distribution systems*

**Stance: Neutral**

- Recirculation systems can combat inefficient hot water distribution systems that result in energy and water waste.
- New home buyers want hot water on demand. \$300 is a small premium to pay for better value.
- Would recommend this as an optional credit, not mandatory.

049 R403.4.1 – *protection of piping insulation*

**Stance: Oppose**

- This would require access to line sets for 6' and sealing the ends of each line.
- Added labor, costs, and logistics (especially mini-splits)

050 – R406, Option 3.2 & 3.5 – *Adds COP to the options table as a recognized rating system*

Stance: Support

- If an appropriate conversion factor is used, two ratings are equivalent.
- No negative impact to energy savings.
- Solves the problem of excluding high-efficiency equipment that doesn't have an HSPF rating.

051 – R405 – *Removes carbon emission factors from section R405*

Stance: Support

- The SBCC is not tasked with managing carbon emissions. This is the role of the Department of Commerce under the Climate Commitment Act.
- Attempts to eliminate specific fuels or technologies through the state energy code will constrain consumer choice and increase cost without achieving any reductions in emissions.

052 – R405 – *Updates emission factors for electricity in R405.3*

Stance: Support

- Focuses on short-term forecasts to reduce speculation and market disruptions.
- Uses projection for 2026 rather than 2031.
- Increases the carbon emissions factor to .93 rather than .44 due to the short-term forecast timeline.

061 – R406.3 – *Removes fuel normalization table from the code.*

Stance: Support

- Natural gas is a regulated industry under the 2021 Climate Commitment Act and is required to achieve 95% reduction in emissions by 2045.
- Natural gas should be given equal treatment within the code as prescribed by statute in RCW 19.27.020. If this statute conflicts with the legislative mandate (Clean Buildings Act passed in 2019), legal or legislative direction should be sought. Presently, neither supersedes one or the other.
- The Clean Buildings Act (2019, HB 1257) only applies to commercial buildings over 50,000 sq. ft.
  - Also encourages the development of renewable natural gas
- Refocuses the conversation on energy efficiency.

064 R401.2, R403.5, R403.13, R405.2, R503.1.3 – *Requires all electric homes*

Stance: Oppose

- Constructing all-electric homes will add \$14,495 to the final sales price of a home.
- All-electric homes will cost homebuyers \$43,485 over the lifetime of their mortgage.
- Such a mandate would price out 31,889 Washington families out of homeownership.
- Whole-home electrification is unpopular for a multitude of reasons:

- ⊞ The payback period for an all-electric house is 44 to 60 years. Gas homes have a payback period of fewer than 10 years.
- ⊞ Most home buyers are only willing to pay \$5,000 upfront (or \$15,000 over the lifetime of their mortgage) on a home to save \$1,000 per year in utility bills. This represents a 20% return on investment.
- ⊞ The median life expectancy of most gas equipment tends to be longer than electric counterparts
  - Gas furnace (20 years) versus heat pump (15 years)
  - Tankless gas water heater (20 years) versus heat pump water heater (12 years)
  - Conventional gas and electric storage-type water heaters have about the same life expectancy (10-13 years)
- ⊞ Gas appliances are more energy-efficient. Example: Gas dryers use 30% less energy than their electric counterparts.
- ⊞ Heat pump systems violate Washington’s noise ordinances and have recently become an enforcement issue for local jurisdictions.
  - Eastern Washington residents will have to purchase more expensive electric equipment that can withstand harsher winters. As a result, they will have to pay \$650 more in utility bills per year compared to comparable high-efficiency gas equipment.
  - Using codes to shape economic choices means Washingtonians will be the ones to be priced out of homeownership. Only 15% of Washington families can afford to purchase a median-priced home under current market conditions.
  - As a result, those unable to afford to purchase a new home will be stuck in the rental market or forced to purchase homes with costly deferred maintenance. Whole-home electrification will hinder the growth of intergenerational wealth and stall any income equality gains historically marginalized populations have made in recent history.
  - **Bottom-line:** You can’t make housing more affordable by making it more expensive with home electrification policies.

065 R403.13, R405.2, R503.1.2 - Heat Pump Space Heater – *requires new homes to have heat pumps for space heating*

Stance: Opposed

- Requiring new homes to have heat pumps for space heating limits energy choice for homeowners and increases the cost of buying a new home.
  - Moderate climate zones see cost increases (relative to gas) of \$1,900 for a regular heat pump system - \$8,500 for a cold-climate heat pump (NAHB).
    - Every \$1,000 added to the cost of a home prices out an additional 2,200 households.
  - Consumers complain that heat pumps don’t provide comfort during the heating season – the supply air temperature does not feel warm.
  - May need supplemental heat source during cold time periods.
  - Prone to improper installation – correct airflow and refrigerant charge.
  - Mechanical issues are prominent and expensive to repair.
  - Lower life expectancy compared to the gas furnace (5 years less according to DOE; gas is 20 years and heat pumps are 15).
- Heat pump systems are severely backlogged due to supply chain disruptions and increased demand due to the 2018 iteration of the energy code.

- Proposal does not apply to simple equipment replacements – the burden of energy efficiency falling on new construction only.
- Proponents’ claim that electricity is 2-4 times more energy-efficient than other fuel sources is inaccurate.
- The heat pump manufacturing process creates some harmful emissions. Heat pumps also use refrigerant, which is harmful to the environment if leaked.
- All prices provided by the proponent are provided by one source and only specific to Seattle. A full assessment of the cost for each climate zone in the state should be provided.
- **Bottom-line:** Mandating heat pumps for space heating will price out 4,200 to 18,700 families from purchasing a home.

#### 066 R403.5, R405.2, R503.1.3 - Heat Pump Water Heater – *requires new homes to have heat pump water heaters for hot water heating*

##### Stance: Opposed

- Requiring new homes to have heat pump water heaters reduces energy choice and increases the costs of buying a new home.
  - Moderate climate sees cost increases (relative to gas) of \$1,300 for lower capacity tanks - \$2,700 for higher capacity tanks (NAHB).
    - Every \$1,000 added to the cost of a home prices out an additional 2,200 households.
  - Consumers complain that noise from heat pump water heater is an issue if it’s placed in conditioned spaces. Complaints also exist for the slow recovery rate so homeowners generally set on “hybrid” mode, allowing electric resistance heating element to operate.
  - Compressor failure prominent.
  - Requires additional maintenance: inspecting and clearing the condensate strainer and drain lines; cleaning the air filter and evaporator.
- Does not apply to simple equipment replacements – the burden of energy efficiency falling on new construction only.
- **Bottom-line:** Mandating heat pump water heaters will price out 2,860 to 5,940 families from purchasing a home.

#### 067 R403.5 - Service hot water systems – *adds exceptions for gas-fired heat pumps for space heating and combination (space and water) systems*

##### Stance: Support

- Increases energy efficiency utilizing products that are already widely available on the market.
- Increases options and thus can lower costs associated with the energy code.

#### 068 R405.3 – *Emissions factors (natural gas)*

##### Stance: Support

- Updates emissions factor of natural gas to a realistic factor and that includes 10% renewable natural gas by 2030.

**069 R403.5 Equipment sizing and efficiency rating** – *adds exception for gas-fired heat pump water heaters and combination (space and water heating) systems*

**Stance: Support**

- Increases energy efficiency utilizing products that are already widely available on the market.
- Increases options and thus can lower costs associated with the energy code.

**070 R405.3** – *Emissions Factors (electric)*

**Stance: Opposed**

- Updates emissions factor of electric to a realistic and updated factor.
- Not convinced utilities will eliminate coal-fired electricity from their portfolios.

**071 R403.5.1 - SWH circulation system** -- *requires ECM motors for SWH circulation pumps in Group R-2 buildings where a central service water heating system serves multiple dwelling units*

**Stance: Neutral**

- Minimal cost to install ECM motors (\$250 per pump).
- Won't impact too many structures – would only impact low-rise apartment buildings that have central service water heating and demand recirculation water systems that service individual dwelling units.

**072 R403.5.1 System return pipe** -- *clarifies that the system return pipe in a circulation and demand recirculation system shall be a dedicated return pipe in all cases*

**Stance: Neutral**

- Clarifies code language.
- Does not allow cold water pipe to be used as the hot water return.
- Minimal cost impact and very little impact on installation practices.

**073 – R406** – *Increases stringency of residential energy code by requiring more energy efficiency credits*

**Stance: Opposed**

- Proponent did not address code enforcement or housing affordability sections of the code change proposal application. Incomplete proposals will not be accepted per the policy of the SBCC as stated in the proposal form.
- Increasing required credits for compliance by 2 credits across the board (except for additions) will increase the costs of constructing housing units.
- Increases credits required for an addition from 1.5 to 2.

- Builders are still trying to figure out design options for the 2018 Energy Code which went into effect only 1 year and 3 months ago (February 1, 2021).
- Moving the goal post so soon and in the middle of a housing supply shortage (and affordability crisis) is irresponsible.
- Supply chain issues are a very real problem for the 2018 Energy Code and will likely be a very real problem for the 2021 Energy Code – heat pumps, electrical transformers, plumbing fixtures, etc. Simple economic principles illustrate that when supply restricts, demand increases, as does cost.
- Providing up to 4.5 credits for renewable electric energy options is not reasonable because the U.S. Commerce Department launched a probe into whether China was skirting tariffs. This has frozen solar imports.
  - CNN: “A survey in late April by the Solar Energy Industries Association, a non-profit trade association, found 318 solar projects in the US had already been delayed or canceled, and several CEOs told CNN they expect more to follow.”
- **Bottom-line:** Further restricting what materials and appliances builders can purchase will further increase the final sales price of a home, making it that much harder for families to own a home. They’ll be stuck renting or if they’re able to purchase, it’s likely an existing home with deferred maintenance and/or less energy efficient (if built before 2006).

**079 Table R402.1.2 - U-Factor replacements** – *increases stringency of windows (previously 0.30, new change would require 0.28)*

**Stance: Oppose**

- Further reduces the number of windows available for builders to install in new homes.
- Builders report compliant windows (0.30) are on back order for 3+ months.
- Windows are already extremely efficient. Currently, Energy Star and U.S. Department of Energy recommend windows equal to less than 0.30 for prescriptive compliance.
- Proponent states that it will take 23-31 years to achieve a simple payback. According to the National Association of Realtors, Washington homeowners only stay in their homes an average of 10 years. Therefore, upfront costs are not a valid investment for the average homeowner.
  - For every \$1,000 added to a mortgage loan, \$3,000 will be paid by the homeowner (due to interest over life of a loan).
  - This would negatively impact housing affordability.
- **Bottom-line:** Builders should be able to choose to go lower but code should not mandate a lower U-value.

**080 R403.5.5 Water Heater install location** – *requires installation of water heaters in conditioned spaces*

**Stance: Opposed**

- Design standard – adds cost and reduces the flexibility of builders to design a home to consumers’ preferences.
- Reduces usable square footage in homes, often closet space. This reduces a home’s value.
- Tank manufacturers are already increasing insulation levels to reduce standby energy losses.

- Consumers complain that noise from heat pump water heater is an issue if it's placed in conditioned spaces.
- **Bottom-line:** Mandating water heater installation within conditioned spaces limits a builder's ability to design homes to consumer preferences and can lower a home's value due to loss of usable living space/square footage.

#### 081 R402.4.2; R402.4.4 Combustion air and fireplace – *editorial*

##### Stance: Support

- Moves combustion air openings and fireplace provisions out of the air leakage section of the energy code so they're easier to locate.
- No increase in requirements.

#### 082 R402.4 – Air Leakage – *editorial*

##### Stance: Support

- No increase in requirements.
- Adds clarity to code language for each building type.
- Reduces confusion for those following the code.

#### 083 – R406.3 – *Moves low-rise multi-family buildings from Residential Energy Code to Commercial Energy Code and increases credits required for compliance.*

##### Stance: Oppose

- Low-rise multi-family buildings do not belong in the Commercial Energy Code.
- Should not act until a previous proposal to move structures from one code to the other is decided.
- Increases code requirements by 2.5 credits across the board (except for additions which only increase by 0.5 credits)
- Housing affordability statement is inaccurate. What is the definition of a typical house?

#### 084 R202, R401.1 - Definition/Scope of Residential Provisions – *Moving low-rise 3- and 4-story apartment buildings with entrances in interior of structure to commercial energy code*

##### Stance: Opposed

- Contractors that build low-rise multifamily under IRC won't develop these structures anymore if changed to require compliance with the commercial energy code.
- Contractors that build these structures typically stay in low-rise and single-family markets. That means they will have to learn an entirely new code, resulting in increased administrative costs and added costs to occupants that eventually move into these structures.
- Moving these structures to commercial energy code means these projects won't pencil out for developers due to increased costs – commercial energy code is a more stringent and costly code with which to comply.

- This change would impact investment decisions and could reduce the number of new structures built.
- Following a more stringent code increases the costs of construction and negatively impacts housing affordability.
  - The state has a shortage of 269,000 housing units – low-rise multi-family buildings are key to affordably increasing our housing supply.
- **Bottom-line:** Keep all low-rise (3- and 4-story apartment buildings) in the residential energy code to preserve housing affordability efforts.

#### 088 R402.4.1.2 Testing agency certification – *establishes minimum credentials for third-party testing agencies*

##### Stance: Concerns

- Establishing minimum credentials could impact small businesses that do not hold a certification from an ISO 17024 accredited certification body.
  - Is there a list of certification bodies authorized to credential testing agencies in Washington?
  - How much does it cost for certification?
  - If limited, has the potential to limit testing options and slow construction projects due to the limited ability of testing professionals.
  - According to our members, ISO accreditation is a barrier for small residential testers because it's hard to get, maintain, and not cost-effective.  
However, there should be some kind of qualifying criteria for approved testers. Some commonly accepted qualifications are:
    - A certified person from an industry entity (Retrotec, TEC, ABAA)
    - A licensed mechanical engineer
    - A pre-approved, third-party list of testers registered with the state (this is my solution to weeding out the conflicts). This currently doesn't exist, but I'd like to talk more about it.
    - There's a new entity in the US called BCTA (Building Compliance Tester's Association) and I'm a founding member of it. It's a group of testers who don't dabble in conflicts and are held to an extreme standard. This group also certifies every single test and makes statewide test results available to the state and local jurisdictions for no fee.
- Adds requirement of including location verification and time/date stamp on date of testing.

#### 089 R403.5.1 Allowed Leakage Rates – *lowers allowable leakage rate for multi-family buildings accessed from the exterior*

##### Stance: Oppose

- Requires multi-family buildings built under IRC (low-rise apartments) with dwelling units accessible from outside to comply with the same requirements as the commercial energy code – 3 air changes per hour rather than 5.
- This will add cost to the construction of low-rise apartments and negatively impact housing affordability.



- Lowering air changes per hour can also impact air quality – causing it to become stale and stagnant and can lead to a buildup of toxins, viruses, pathogens, etc. Especially if occupants don't change their air filters consistently.
- Expert opinions vary on what ventilation rates should be achieved in homes.
- The proponent is correct in that the testing price will not change. However, costs associated with getting to lower air changes will increase the costs of delivering low-rise apartments to the housing market.
- **Bottom-line:** Air change rates should be dependent upon the structure being built. Recommended rates should vary according to the type of structure, air system in use (some systems don't bring in fresh air, they only re-circulate air already present), desired air quality, and overall efficiency of the structure.

**090 R402.4.1.1 Clarification of insulation installation requirements – *insulation to be installed according to manufacturer's specifications and to Grade I (minor defects) quality***

**Stance: Support**

- Explicitly states that insulation should be installed at Grade I quality in accordance with ICC/RESNET 301.
- Provides a clearer standard – proponent states that new construction installation is often installed at Grade II (moderate defects) or worse.

**097 – R406 – *Adds ERI index into the energy code***

**Stance: Support**

- Allows an additional path for energy code compliance.
- Falls in line with proposal 022.
- Helps jurisdictions potentially offset increased workloads from the 2018 energy code.