STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Jan 2022

Log No. 24-RE-035 Vers. 4
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Code being amended: ☐ Commercial Provisions ☒ Residential Provisions

Code Section # _R406.3_____

Brief Description:

Divide “small-medium-large” home size categories into gradations of 250 ft^2 steps.

Increase number of credits required as follows:

- No change to credits required for small dwellings.
- Reduced credits required for dwellings 1500 – 2250 ft^2.
- Increased credits for dwellings 2500 ft^2 and larger, graduated in half-credit increments up to 10 at 3500 ft^2.
- Smaller increases in credits for Climate Zone 5B, if HRV proposal is approved by SBCC
- No change to credits required for R-2 dwelling units

Proposed code change text:

R406.3 Additional energy efficiency requirements. Each dwelling unit in a residential building shall comply with sufficient options from Tables R406.2 and R406.3 so as to achieve the ~~following~~ minimum number of credits required by Table R406.3:

~~1. Small Dwelling Unit: ..... 5.0 credits Dwelling units less than 1500 square feet in conditioned floor area with less than 300 square feet of fenestration area. Additions to existing building greater than 500 square feet of heated floor area but less than 1500 square feet.~~

~~2. Medium Dwelling Unit: ..... 8.0 credits All dwelling units that are not included in #1, #3 or #4.~~

~~3. Large Dwelling Unit: ..... 9.0 credits Dwelling units exceeding 5000 square feet of conditioned floor area.~~

~~4. Dwelling units serving Group R-2 occupancies: ..... 6.5 credits See Section R401.1 and residential building in Section R202 for Group R-2 scope. 5. Additions 150 square feet to 500 square feet: ..... 2.0 credits The drawings included with the building permit application shall identify which options have been selected and the point value of each option, regardless of whether separate mechanical, plumbing, electrical, or other permits are utilized for the project.~~

TABLE R406.3(1) – Option A

Additional Energy Efficiency Requirements

(Code change if neither U-0.27 windows nor 0.30 air leakage limits are approved)

Credits	Conditioned Floor Area (ft^2)
5	Smaller than 1,500
6	1,500 – 1,749
7	1,750 – 1,999
8	2,000 – 2,249
9	2,250 – 2,499
9.5	2,500 – 2,749
9.5	2,750 – 2,999
9.5	3,000 – 3,249
10	3,250 – 3,499
10	3,500 or larger

TABLE R406.3(1) – Option B

Additional Energy Efficiency Requirements

(Code change if both U-0.27 windows and 0.30 air leakage limits are approved)

Credits	Conditioned Floor Area (ft^2)
5	Smaller than 1,500
6	1,500 – 1,749
7	1,750 – 1,999
8	2,000 – 2,249
8	2,250 – 2,499
8.5	2,500 – 2,749
8.5	2,750 – 2,999
9	3,000 – 3,249
9.5	3,250 – 3,499
10	3,500 or larger

If only U-0.27 windows or 0.30 ACH leakage, but not both, is approved by SBCC, additional credits will be increased to achieve no less than the savings achieved by approval of both code changes.

TABLE R406.3(1)(a) – Option C as separate credit table for Climate Zone 5B

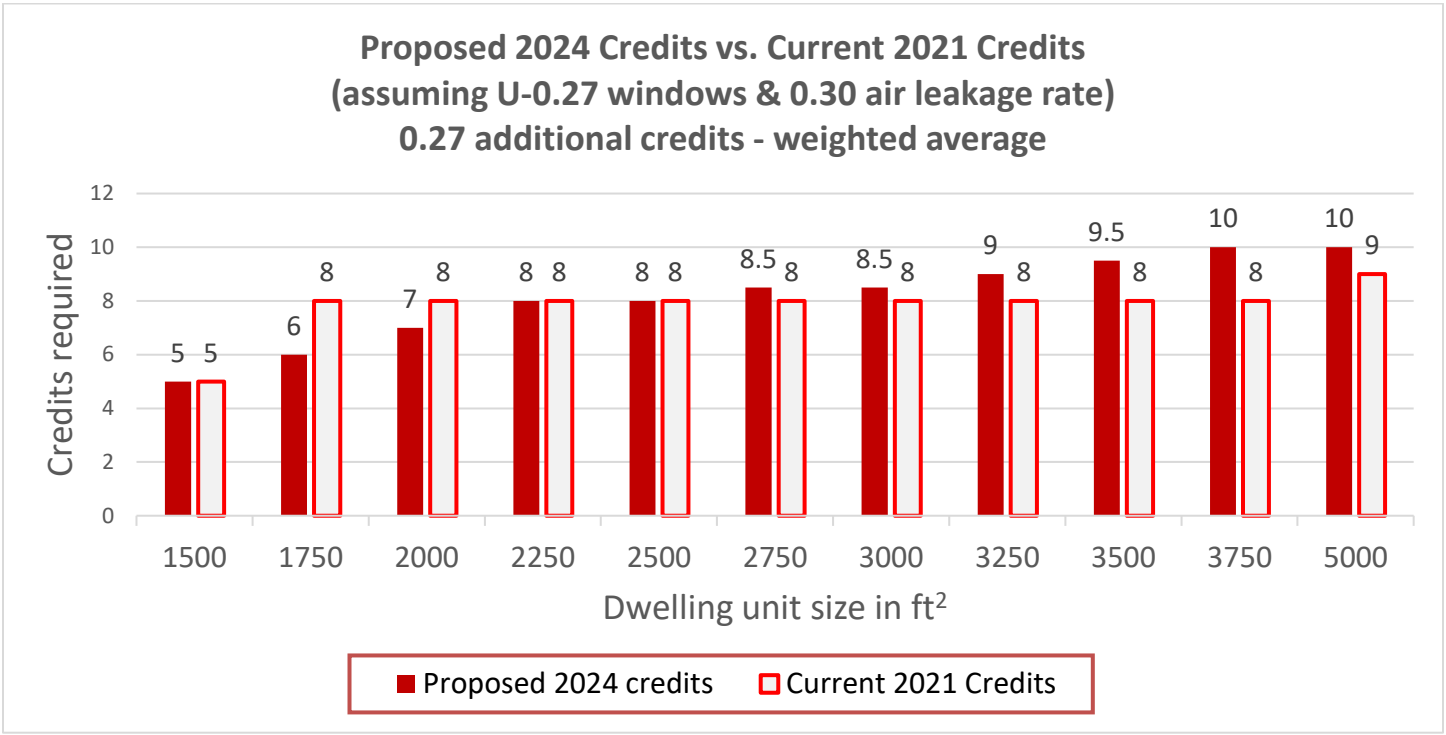
Additional Energy Efficiency Requirements

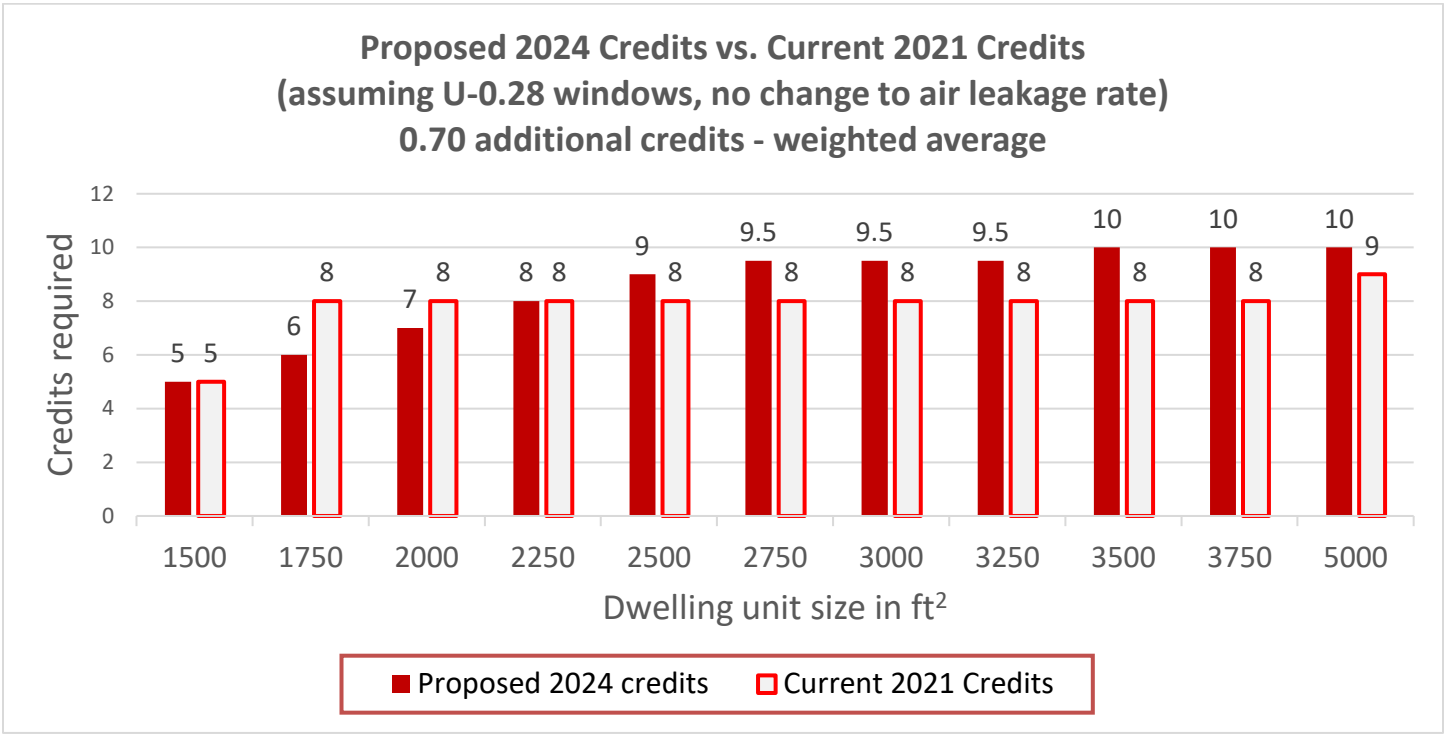
(CZ 5B only: Code change if U-0.27 windows, 0.30 air leakage limits, and HRV are approved)

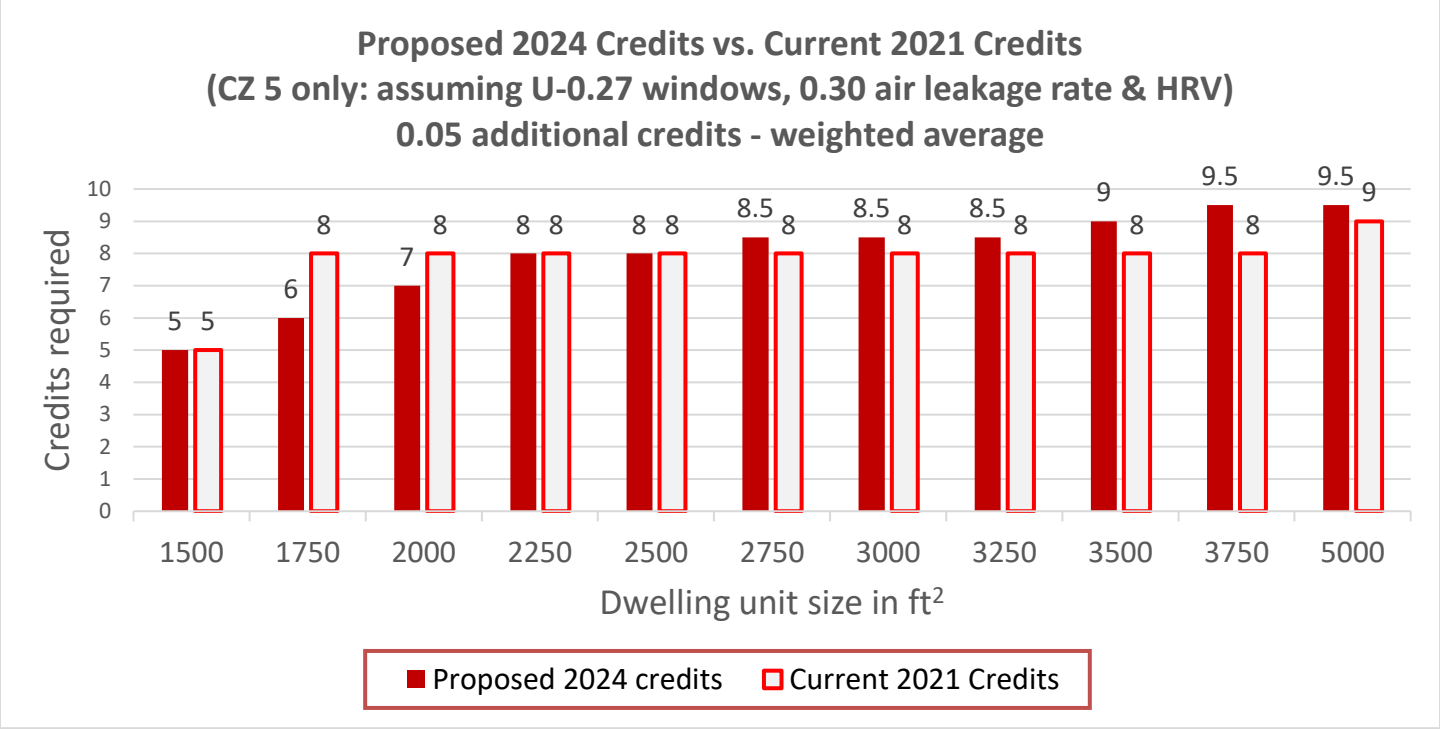
Credits	Conditioned Floor Area (ft^2)
5	Smaller than 1,500
6	1,500 – 1,749
7	1,750 – 1,999
8	2,000 – 2,249
8	2,250 – 2,499
8.5	2,500 – 2,749
8.5	2,750 – 2,999
8.5	3,000 – 3,249
9	3,250 – 3,499
9.5	3,500 or larger

If only U-0.27 windows or 0.30 ACH leakage, but not both, is approved by SBCC, additional credits will be increased to achieve no less than the savings achieved by approval of both code changes.

Purpose of code change:







This proposal makes two major changes:

- It replaces the current "small-medium-large" home size categories with gradations in conditioned space of 250 ft^2 steps between 1,500 ft^2 and 3,500 ft^2.
- It maintains or reduces credit requirements for homes smaller than 2,000 ft^2 while increasing credit requirements for homes larger than 2,500 ft^2.

Note that multiple versions are proposed, with the final increase in credits depending on the ultimate SBCC action on three other proposals that have been approved by the Energy Code TAG: U-0.27 windows, 0.30 ACH air leakage, and for Climate Zone 5 only, HRV (heat recovery ventilator). The objective is to scale the credit increases to result in an overall energy use reduction of approximately 10% as compared with the 2021 code.

The 2021 code jumps 3 credits from just below 1,500 ft^2 to just above 1,500 ft^2, while this proposal divides that into multiple steps, with reduced credit requirement for homes smaller than 2,000 ft^2 and increased credits for homes larger than 2,500 ft^2. With the 2024, 2027, and 2030 codes, we're required by state law to reduce energy usage from the current 42% down to 30% of the 2006 code baseline, a glide path of 4% of 2006 code energy use each cycle, or approximately 10% of 2021 code energy use each cycle.

The overall credit increases proposed here incrementally reduce energy use for new homes, while allowing market-driven selection of the specific efficiency features to be included.

A medium-sized home in Spokane, designed to the 2021 WSEC, is expected to consume 13,011 kWh/yr, and a Seattle home 9,581 KWh/yr.

This proposal does not increase the credits required for small homes or R-2 dwelling units, both because smaller homes inherently consume less energy than larger, and to recognize affordability concerns at the lower end of the market.

<u>Savings due to change from U-0.30 to U-0.28 windows:</u>
Seattle 9,581– 237 = 9,344 KWh/yr (2.5%)
Spokane: 13,011 – 329 = 12,682 KWh/yr (2.5%)

Savings due to change from U-0.30 to U-0.27 windows:
Seattle 9,581– 355 = 9,226 KWh/yr (3.8%)
Spokane: 13,011 –= 12,518 KWh/yr (3.8%)

Savings due to air leakage rate change from 4.0 to 3.0 ACH/50:
Seattle: 9,581– 274 = 9,307 KWh/yr (2.9%)
Spokane: 13,011 – 413 = 12,598 KWh/yr (3.2%)

Savings due to 0.7 additional credits (weighted average):
1,200 kWh/credit x 0.7 = 840 kWh/yr reduction
Seattle: 9,581 – 840 = 8741 KWh/yr (9.1%)
Spokane: 13,011 – 840 = 12,171 KWh/yr (9.3%)

Total savings for U-0.28 windows and 0.7 additional credits:
Seattle: 237 + 840 = 1,077 KWh/yr (11.2%)
Spokane: 329 + 840 = 1,169 KWh/yr (9.0%)

Total savings for U-0.27 windows, 0.30 ACH air leakage, and 0.27 additional credits:
Seattle: 355 + 274 + 324 = 953 KWh/yr (9.9%)
Spokane: 493 + 413 + 324 = 1,230 KWh/yr (9.5%)

Additional savings for HRV in climate zone 5B:
HRV savings: 0.13 kWh/ ft^2 x 2,400 ft^2 = 312 kWh/yr x 0.85 = **265** kwh
(0.85 factor recognizes the interactive effects of improved windows and air tightness)

Total savings for U-0.27 windows, 0.30 ACH air leakage, HRV, and 0.27 additional credits:
Spokane only: 493 + 413 + 60 + 265 = 1,231 KWh/yr (9.5%)

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	Duane Jonlin	Email address	duane.jonlin@seattle.gov
Your organization	City of Seattle	Phone number	206-233-2781
Other contact name	Click here to enter text.		

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.

Increases construction costs for medium and large homes, not for smaller homes. Energy savings are similar for any selection.

Provide your best estimate of the **construction cost** (or cost savings) of your code change proposal?

$1000/ dwelling unit for each additional credit.

For solar, assume 1.1 kW for 1,200 kWh annual production in Seattle, 1.0 kW in Spokane. $3,200 per credit. (2025 Costs from Energy Sage)

Selections of efficiency credits vary, and the costs associated with those credits vary greatly.

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

- 1.0 credit = 1200 KWH/yr savings for medium dwelling unit

One additional energy credit (1,200 kWh) will equal approximately ten percent of annual energy use.

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

None

Small Business Impact. Describe economic impacts to small businesses:

None

Housing Affordability. Describe economic impacts on housing affordability:

Modest cost increase for new homes larger than 3,000 ft^2, offset by decreased utility bills.
1200 kWh x $0.11 = $132/yr savings = 7.5 year simple payback if additional credit costs $1,000

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.