



Log No. 097 Revised 7/22/21

STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development Standard Energy Code Proposal Form

Code being amended: Commercial Provisions Residential Provisions

Code Section # C403.4.1

Brief Description:

This proposal adds demand responsive control requirements for thermostats.

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.)

Add new definitions as follows:

DEMAND RESPONSE SIGNAL. A signal that indicates a price or a request to modify electricity consumption for a limited time period.

DEMAND RESPONSIVE CONTROL. A control capable of receiving and automatically responding to a demand response signal.

Add new section as follows:

C403.4.1.7 Demand responsive ~~thermostats~~controls. All ~~thermostats~~thermostatic controls shall be provided with demand responsive controls capable of increasing the cooling setpoint ~~by no less than 4°F (2.2°C)~~ and decreasing the heating setpoint by no less than 4°F (2.2°C). ~~The thermostatic controls shall be capable of performing all other functions provided by the control when the demand responsive controls are not available.~~ Systems with direct digital control of individual zones reporting to a central control panel shall be capable of remotely increasing the cooling setpoint and decreasing the heating setpoint for each zone by no less than 4°F (2.2°C).

Exception: Health care and assisted living facilities.

Purpose of revision:

The TAG expressed an interest in seeing more of the detail from the original Title 24 language make its way into this proposal, particularly language for multi-zone, DDC systems. This language makes the integration of DR control for multi-zone systems more explicit. The original Title 24 language has been rewritten using IECC language. This proposal does not include all of the Title 24 approach. The Title 24 approach is very prescriptive and can be restrictive, as evidenced by efforts in the 2022 proposals to open it up to accommodate emerging technologies. By being more descriptive in the requirements, this proposal will better accommodate this rapidly emerging space.

The proposal also includes some terminology and editorial changes for greater clarity.

Purpose of code change:

This proposal requires that thermostats in commercial buildings have demand control functionality that can be used to adjust thermostat set-points. Since this requirement is part of the construction code, it will not require buildings to participate in any demand response programs. But it will ensure that buildings are capable of participating, so that Washington buildings will be able to help integrate building loads with available production.

Grid flexibility is one of the foundations of achieving meaningful decarbonization of building energy as it is an essential element of decarbonizing the electrical grid. Carbon free energy sources like solar and wind have varying production over the course of the day and the year. Demand responsive controls that can respond to demand response signals enable buildings to shape their loads to better align with available energy production. This could come in the form of curtailing energy use when demand is high or utilizing excess production for building tasks like pre-conditioning spaces or service hot water when demand is lower.

The ability to adjust by 4 degrees was chosen based on demand flexibility requirements in California’s energy code Title 24 Part 6. This will align the requirements with the biggest American market – which is also a neighboring market – for demand responsive thermostats.

The proposal includes an exemption for thermostats serving health care and assisted living facilities as these are occupancies where climate control can be related to health care.

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

- | | |
|--|---|
| <input type="checkbox"/> Addresses a critical life/safety need. | <input type="checkbox"/> Consistency with state or federal regulations. |
| <input type="checkbox"/> The amendment clarifies the intent or application of the code. | <input type="checkbox"/> Addresses a unique character of the state. |
| <input checked="" type="checkbox"/> Addresses a specific state policy or statute.
(Note that energy conservation is a state policy) | <input type="checkbox"/> Corrects errors and omissions. |

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

- | | | |
|--|--|--|
| <input type="checkbox"/> Single family/duplex/townhome | <input checked="" type="checkbox"/> Multi-family 4 + stories | <input type="checkbox"/> Institutional |
| <input type="checkbox"/> Multi-family 1 – 3 stories | <input checked="" type="checkbox"/> Commercial / Retail | <input checked="" type="checkbox"/> Industrial |

Your name Sean Denniston Email address sean@newbuildings.org

Your organization New Buildings Institute Phone number 503-481-7253

Other contact name [Click here to enter text.](#)

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 360-407-9278.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

Demand responsive functionality will present a cost-saving opportunity for buildings in the future. More and more utilities are moving beyond voluntary programs and are expanding use of time-of-use rates for electricity as a tool for shaping demand. Installing demand-responsive thermostats now will allow building tenants and owners to better control their utility costs.

Demand responsive functionality has been required in Title24 since the 2013 edition and was found cost effective in CA.¹ In the 8 years since, equipment prices have decreased (less than \$60 for a basic DR thermostat² compared to just under \$30 for a basic 7-day programmable thermostat³) and WA peak prices have increased.

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](#)**)

\$0.03/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

\$30/unit x (10 units) / 10,000sf

10,000 sf office with 10 thermostat zones of 1000 sf each.

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

8.3-2.7 WH/ square foot (or) [Click here to enter text.](#)KBTU/ square foot

The Title24 CASE report found 83-274 kWh savings in CA climate zones 1, 2 and 16 (the closest analogous climate zones to WA's climate zones) for a 10,000 office.⁴

(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:

This proposal will add a minimal amount of extra plan review. Spec sheets will need to be checked to ensure that the thermostat meets the requirement. There should be no additional inspection time if site inspectors are checking that thermostats are consistent with the construction documents.

¹ *Final CASE Report: Upgradeable Setback Thermostats*, California Statewide Codes and Standards Enhancement (CASE) Program, October 2011, https://title24stakeholders.com/wp-content/uploads/2020/01/2013_CASE-Report_Upgradeable-Setback-Thermostats.pdf

² <https://www.supplyhouse.com/Venstar-T3700-Explorer-T3700-Residential-Digital-Thermostat-2-Heat-1-Cool>

³ <https://www.supplyhouse.com/Lux-P711-010-7-Day-5-2-day-Programming-or-Non-Programmable-Thermostat-Horizontal-Mount-1-Heat-1-Cool>

⁴ *Final CASE Report: Upgradeable Setback Thermostats*, California Statewide Codes and Standards Enhancement (CASE) Program, October 2011, https://title24stakeholders.com/wp-content/uploads/2020/01/2013_CASE-Report_Upgradeable-Setback-Thermostats.pdf

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

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