Log No. **095 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 # C403.15

Brief Description:

This proposal adds requirements for dehumidification efficiency for indoor growing facilities.

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:

DESSICANT DEHUMIDIFICATION SYSTEM. A mechanical dehumidification technology that uses a solid or liquid material to remove moisture from the air.

INTEGRATED HVAC SYSTEM. An HVAC system designed to handle both sensible and latent heat removal. Integrated HVAC systems may include, but are not limited to HVAC systems with a sensible heat ratio of 0.65 or less and the capability of providing cooling, dedicated outdoor air systems, single package air conditioners with at least one refrigerant circuit providing hot gas reheat, and stand-alone dehumidifiers modified to allow external heat rejection.

STAND-ALONE DEHUMIDIFIER. A product with the sole purpose of dehumidifying the space that does not include a portable air conditioner, room air conditioner, or packaged terminal air conditioner. Stand-alone dehumidifier is a self-contained, electrically operated, and mechanically encased assembly consisting of 1) a refrigerated surface (evaporator) that condenses moisture from the atmosphere, 2) a refrigerating system, including an electric motor, 3) an air-circulating fan, and 4) a means for collecting or disposing of the condensate.

Add new text as follows:

C403.15 Dehumidification in spaces for plant growth and maintenance. Equipment that dehumidifies building spaces used for plant growth and maintenance shall be one of the following:

1. *Stand-alone dehumidifiers* that meet the following minimum integrated energy factors as measured by the test conditions in Appendix X1 to Subpart B of 10 CFR Part 430:
    1.1. Minimum integrated energy factor of 1.77 L/kWh for product case volumes of 8.0 cubic feet or less;
    1.2. Minimum integrated energy factor of 2.41 L/kWh for product case volumes greater than 8.0 cubic feet.
2. *Integrated HVAC system*, including but not limited to heat pump technology, with on-site heat recovery designed to fulfill at least 75 percent of the annual energy for dehumidification reheat;
3. Chilled water system, including but not limited to heat pump technology, with on-site heat recovery designed to fulfill at least 75 percent of the annual energy for dehumidification reheat; or
4. Solid or liquid *desiccant dehumidification system* for system designs that require dewpoint of 50°F or less.

Purpose of revision:

The TAG expressed an interest in having an option for heat pump dehumidification. The subgroup met and concluded that the existing options allowed for a heat pump option. This revision explicitly draws attention to heat pump options that meet existing options without requiring them.

Purpose of code change:

With lighting for indoor plant growth and maintenance becoming regulated under the 2021-IECC, HVAC loads emerge as the next major opportunity to improve the energy efficiency of indoor horticulture. Of those, dehumidification is the load that is the most under/un-addressed in the existing WSEC.

This proposal is based on the requirements currently being adopted for the 2022 edition of Title 24. These requirements are also similar to requirements adopted in Denver, CO which require one of the following:

- Stand-alone dehumidification units with a minimum energy factor of 1.9 L/kWh,
- Chilled water system with heat recovery from the condenser coil to achieve dehumidification reheat, or
- Integrated HVAC system with heat recovery to achieve dehumidification reheat.

Denver also allows supplementary heat for dehumidification provided that the primary dehumidification system can fulfill at least 60 percent of the facility's peak dehumidification needs. The code also sets a minimum energy efficiency cooling equipment used in indoor growing facilities.[1]

The proposed language gives multiple options for meeting the requirement, which allows indoor growing facilities to options to integrate compliance dehumidification systems into multiple different HVAC designs and does not force facilities into a single dehumidification strategy.

There is currently no national standard for indoor growing dehumidification equipment. 10 CFR, Part 430, Subpart B - Appendix X1 does provide a method for measuring the energy input for standalone dehumidifiers, so this has been leveraged to set the threshold for that type of equipment. However, standalone equipment will not be an appropriate strategy for all facilities, so the proposal also includes options to utilize recovered energy for dehumidification reheat needs.

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

[1] Denver GOV. 2019. Denver Gov.org. 04 25. https://www.denvergov.org/content/dam/denvergov/Portals/696/documents/Denver_Building_Code/2019-code-update/iecc/(p54)352_IECC_C406_PointsOptions.pdf.

☒ Commercial / Retail ☐ Institutional ☒ 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.

This proposal will deliver significant energy savings to buildings with indoor plant growth facilities.

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**)

$8.11/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

The CASE Report[2] found that incremental costs of $8.11/sf of growing area. Total cost per square foot of building would vary based on how much of the facility is dedicated to non-growing uses. The savings per total building square footage would vary depending on the amount of space dedicated to non-growing uses.

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

kWH/ square foot (or) 80-81 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

The CASE Report found that savings for CA climate zones 1,2 & 16 (the closest match to WA's climate zones), was 80-81 kbtu/sf/yr.[3]

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 time for both plan review and site inspection. The additional time should be minimal as this requirement just adds one additional criteria to equipment that plan checkers and site inspectors are already checking.

[2] Final CASE Report: Controlled Environment Horticulture, California Statewide Codes and Standards Enhancement (CASE) Program, Oct. 2020, https://title24stakeholders.com/wp-content/uploads/2020/10/2022-T24-NR-CEH-Final-CASE-Report.pdf.
[3] Final CASE Report: Controlled Environment Horticulture, California Statewide Codes and Standards Enhancement (CASE) Program, Oct. 2020, https://title24stakeholders.com/wp-content/uploads/2020/10/2022-T24-NR-CEH-Final-CASE-Report.pdf.

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