

DOCKETED	
Docket Stamp Updated:	5/14/2024 12:09:37 PM
Docket Number:	24-BSTD-01
Project Title:	2025 Energy Code Rulemaking
TN #:	256348
Document Title:	Bradford White Corporation Comments to 45 Day Language
Description:	N/A
Filer:	System
Organization:	Bradford White Corporation/Michael Corbett
Submitter Role:	Public
Submission Date:	5/13/2024 4:25:11 PM
Docketed Date:	5/13/2024

DOCKETED

Docket Number:	24-BSTD-01
Project Title:	2025 Energy Code Rulemaking
TN #:	256348
Document Title:	Michael Corbett Comments - BWC Comments to 45 Day Language
Description:	N/A
Filer:	System
Organization:	Michael Corbett
Submitter Role:	Public
Submission Date:	5/13/2024 4:17:38 PM
Docketed Date:	5/13/2024

*Comment Received From: Michael Corbett
Submitted On: 5/13/2024
Docket Number: 24-BSTD-01*

BWC Comments to 45 Day Language

Additional submitted attachment is included below.



May 13, 2024

California Energy Commission
Building Energy Efficiency Standards - Title 24
715 P Street
Sacramento, California 95814

[Submitted electronically via: [California Energy Commission : e-comment : Submit Comment](#)]

Re: 2025 Title 24 Part 6, 45-day language

To Whom It May Concern:

On behalf of Bradford White Corporation (BWC), we would like to thank you for the opportunity to comment on California Energy Commission's (CEC) Title 24, Part 6 45-day language.

BWC is an American-owned, full-line manufacturer of residential, commercial, and industrial products for water heating, space heating, combination heating, and water storage. In California, a significant number of individuals, families, and job providers rely on our products for their hot water and space heating needs. We have compiled our comments and questions to the CEC's 45-day language below.

Section: 110.3(c)7B.

BWC agrees with the CEC that heat pump water heaters (HPWH) need adequate ventilation in order to provide enough hot water in the most efficient manner. Inadequate ventilation may lead to unexpected cool water events and overall lower water heater performance. Setting a standard and a methodology for ensuring adequate ventilation for newly constructed buildings in absence of a manufacturer's recommendation is a good idea, however that standard should not take precedence over a manufacturer's recommendation. For these reasons, BWC recommends the following changes to the ventilation language:

- B. Ventilation Consumer integrated HPWHs shall meet one of the ventilation requirements below. Minimum volume and opening size requirements shall be the sum of all HPWHs installed within the same space. Compressor capacity shall be determined using AHRI 540 Table 4 reference conditions for refrigeration with the "High" rating test point:

- 1. Installed using a method certified by the manufacturer to meet the ventilation requirements of 110.3(c)7B.

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



2. For HPWH installation without ducts, the installation space shall have a volume equal to the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method; or
 3. For HPWH installation without ducts, installation space shall be vented to a communicating space via permanent openings, according to the following requirements:
 - i. Communicating space shall meet the minimum volume of section 110.3(c)7B1 above, minus the volume of the HPWH installation space; and
 - ii. Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum NFA the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent openings shall be fully louvered doors or two openings, one located within 12 inches from the enclosure top and one located within 12 inches from the enclosure bottom; or
 4. For HPWH installations with ducts, the following requirements shall be met:
 - iii. The space joined to the installation space via ducts shall meet the minimum volume of section 110.3(c)7B1 above, minus the volume of the HPWH installation space; and
 - iv. All duct connections and building penetrations shall be sealed; and
 - v. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to minimum of R-6; and
 - vi. If only the HPWH inlet or outlet is ducted, installation space shall include permanent openings consist of a single layer of fixed flat slat louvers or grilles in the bottom half of the room, and/or a door undercut. With a ducted inlet, the minimum NFA shall be equal to the cross-sectional area of the duct. With a ducted exhaust, the minimum NFA shall be the larger of 20 square inches or the minimum NFA provided by the manufacturer for this method; and
 - vii. If the inlet and outlet ducts both terminate within the same pressure boundary, airflow from the termination points shall be diverted away from each other; or
- ~~4. Installed using a method certified by the manufacturer to meet the ventilation requirements of 110.3(c)7B.~~

In addition to these changes, BWC urges the CEC to continue evaluating the proposed standards through working with manufacturers as well as considering learnings from field studies to determine whether the space and ducting provisions are adequate to support current and future HPWH installations. Comments submitted by Gary Klein and Nick Brown in TN: 256224 suggest much larger spaces and ducting provisions than the current recommendation.

Section 150.0(n) and Section: 160.9(e)

BWC reviewed section 150.0(n) and 160.9(e) and found inconsistencies in the specifications prescribed for designated spaces for future HPWH installation. Our recommendation is to make these sections the same requirements, using the requirements listed under 160.9(e). In terms of the inconsistency, the designated space requirements for a future HPWH in section 150.0(n) for single family homes is less than section 160.9(e) for multifamily individual dwelling units. BWC suggests aligning these two requirements and using the larger space requirements as shown in section 160.9(e). Furthermore, section 150.0(n) has no provisions in place for ventilation. We recommend including ventilation provisions in section 150.0(n). Our proposed edits to section 150.0(n) are shown below:

Section 150.0(n)

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



(n) Water heating system.

Systems using gas or propane water heaters to serve individual dwelling units shall designate a space at least **2.5 feet by 2.5 feet wide and 7 feet tall** **39 inches by 39 inches and 96 inches tall** suitable for the future installation of a heat pump water heater (HPWH) by meeting either A or B below. All electrical components shall be installed in accordance with the California Electrical Code:

- A. If the designated space is within 3 feet from the water heater, then this space shall include the following:
 - i. A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, ~~10 AWG copper~~ branch circuit rated at 30 amps minimum, within 3 feet from the water heater and accessible to the water heater with no obstructions; and
 - ii. Both ends of the unused conductor shall be labeled with the word “spare” and be electrically isolated; and
 - iii. A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words “Future 240V Use”; and
 - iv. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.
 - B. If the designated space is more than 3 feet from the water heater, then this space shall include the following:
 - i. A dedicated 240 volt branch circuit shall be installed within 3 feet from the designated space. The branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as “240V ready”; and
 - ii. The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future HPWH installation. The reserved space shall be permanently marked as “For Future 240V use”; and
 - iii. Either a dedicated cold water supply, or the cold water supply shall pass through the designated HPWH location just before reaching the gas or propane water heater; and
 - iv. Either a dedicated cold water supply, or the cold water supply shall pass through the designated HPWH location just before reaching the gas or propane water heater; and
 - v. The hot and cold water piping at the designated HPWH location shall be exposed and readily accessible for future installation of an HPWH; and
 - vi. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.
- ~~2. Water heating recirculation loops serving multiple dwelling units shall meet the requirements of Section 110.3(c)4.~~
2. Solar water-heating systems and collectors shall be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the Executive Director.
 3. Instantaneous water heaters with an input rating greater than 6.8 kBTU/hr (2kW) shall meet the requirements of Section 110.3(c)6.
 4. A ventilation method meeting one of the following:
 - a. The designated space for the future heat pump water heater shall have a minimum volume of 700 cubic feet; or
 - b. The designated space for the future heat pump water heater shall vent to a communicating space in the same pressure boundary via permanent openings with a minimum total NFA

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



of 250 square inches., so that the total combined volume connected via permanent openings is 700 cubic feet or larger. The permanent openings shall be:

- i. Fully louvered doors with fixed louvers; or
 - ii. Two permanent fixed openings located within 12 inches from the enclosure top and bottom;
- c. The designated space for the future heat pump water heater shall include two 8 inches capped ducts, venting to the building exterior:
- i. All ducts, connections, and building penetrations shall be sealed.
 - ii. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to a minimum insulation level of R-6.
 - iii. Airflow from termination points shall be diverted away from each other.

Section 160.9(e)

(e) Individual Heat Pump Water Heater Ready. Systems using gas or propane water heaters to serve individual dwelling units shall include the following components and shall meet the requirements of Section 160.9(f):

1. A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor branch circuit rated to 30 amps minimum, within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all the following:
 - A. Both ends of the unused conductor shall be labeled with the word “spare” and be electrically isolated; and
 - B. A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above and labeled with the words “Future 240V Use”; and
2. A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance, and
3. The construction drawings shall designate a space at least 39 inches by 39 inches and 96 inches tall for the future location of heat pump water heater.
4. A ventilation method meeting one of the following:
 - A. The designated space for the future heat pump water heater shall have a minimum volume of 700 cubic feet; or
 - B. The designated space for the future heat pump water heater shall vent to a communicating space in the same pressure boundary via permanent openings with a minimum total NFA of 250 square inches., so that the total combined volume connected via permanent openings is 700 cubic feet or larger. The permanent openings shall be:
 - i. Fully louvered doors with fixed louvers; or
 - ii. Two permanent fixed openings located within 12 inches from the enclosure top and bottom;
 - C. The designated space for the future heat pump water heater shall include two 8 inches capped ducts, venting to the building exterior:
 - i. All ducts, connections, and building penetrations shall be sealed.
 - ii. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to a minimum insulation level of R-6.
 - iii. Airflow from termination points shall be diverted away from each other.

Section 150.1(8), section 150.2(a)1D, section 150.2(b)1Hiii, section 170.2(d)1, and section 180.2(b)3C

Each of the following sections allows for a NEEA approved HPWH as a prescriptive compliance option. For the new construction prescriptive approach in section 150.1(8) and 170.2(d)1, the code specifies that a

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



“240 volt” NEEA Tier 3 HPWH may be used, along with exception 2 for 120-volt products. For additions and alterations in section 150.2, the requirement is simply a NEEA Tier 3 HPWH. Since 120-volt products are relatively new to the market, BWC raise the following questions regarding the CEC’s intent of having different requirements with respect to 240 volt and 120-volt products:

1. Was it the intent of the CEC to only allow “240 Volt” NEEA Tier 3 or better products to be used in new construction?
2. For additions and alterations, was it the intent of the CEC to allow any HPWH meeting NEEA Tier 3 (including 120-volt) to be used to comply?
3. Barring differences in HPWH voltage, is there a specific reason that 120-volt HPWHs are limited to 1 bedroom or less homes in the new construction prescriptive approach?
 - a. If a 120-volt HPWH meets the required First Hour Rating (FHR) of the California Plumbing Code, why would it not be allowed in any building?

Section 150.1

8. Domestic water-heating systems. Water-heating systems shall meet the requirements of A, B, C, or shall meet the performance compliance requirements of Section 150.1(b)1. For recirculation distribution systems, only demand recirculation systems with manual on/off control as specified in the Reference Appendix RA4.4.9 shall be used:

- A. A single 240 volt heat pump water heater (HPWH). The storage tank shall be located in the garage or conditioned space. In addition, meet the following:
 - i. A compact hot water distribution system as specified in the Reference Appendix RA4.4.6 in climate zone 1 and 16; and
 - ii. A drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9 in climate zone 16.
- B. A single 240 volt HPWH that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher. In addition, for Climate Zone 16, a drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9 and the storage tank shall be located in the garage or conditioned space.
- C. A solar water-heating system with electric backup meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum annual solar savings fraction of 0.7.

~~**Exception 1** to Section 150.1(c)8: For climate zones 3, 4, 13 and 14, a gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank may be installed.~~

~~NOTE: The space conditioning system shall be a heat pump as specified in Section 150.1(c)6.~~

~~**Exception 2** 1 to Section 150.1(c)8: An instantaneous electric water heater with point of use distribution as specified in RA4.4.5 may be installed for new dwelling units with a conditioned floor area of 500 square feet or less.~~

Exception 3 2 to Section 150.1(c)8A and B: A 120V HPWH may be installed in place of a 240V HPWH for new dwelling unit with one bedroom or less.

Section 150.2(a)1D

- D. **Water heater.** When an ~~second~~ additional water heater is installed as part of the addition, one of the following types of water heaters shall be installed:
 - i. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of 110.12(a) or has a ANSI/CTA-2045-B communication port; or
 - ii. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



- iii. ~~A gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank; or~~
- iii. For additions that are 500 square feet or less, an ~~instantaneous~~ electric water heater with point of use distribution as specified in RA4.4.5; or
- iv. A water-heating system determined by the Executive Director to use no more energy than the one specified in ~~Item~~ item i, ii, or iii, ~~or iv.~~

Section 150.2(b)1Hiii

- iii. **Water heating system.** The water heating system shall meet one of the following:
 - a. A natural gas or propane water-heating system; or
 - b. A single heat pump water heater. The storage tank shall not be located outdoors and be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2045-B communication port; or
 - c. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
 - d. If the existing water heater is an electric resistance water heater, a consumer electric water heater; or
 - e. A water-heating system determined by the Executive Director to use no more energy than the one specified in Item a above; or if no natural gas is connected to the existing water heater location, a water-heating system determined by the executive director to use no more energy than the one specified in Item d above.

170.2(d)1

1. Individual Systems. For systems serving individual dwelling units, the water-heating system shall meet the requirement of either A, ~~or B or C~~, or shall meet the performance compliance requirements of Section 170.1. For recirculation distribution systems serving individual dwelling units, only demand recirculation systems with manual on/off control as specified in the Reference Appendix RA4.4.9 shall be used.:

- A. A single 240 volt heat pump water heater. In addition, meet the following:
 - i. A compact hot water distribution system as specified in Reference Appendix RA4.4.6 in climate zones 1 and 16; and
 - ii. A drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9 in Climate Zone 16.
- B. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher. In addition, for climate zone 16, a drain water heat recovery system that is field verified as specified in Reference Appendix RA3.6.9.
- C. ~~A gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank.~~

Exception 1 to Section 170.2(d)1: Multifamily buildings four habitable stories or greater may install a gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank.

Exception 2 to Section 170.2(d)1: A 120V HPWH may be installed in place of a 240V HPWH for new dwelling unit with one bedroom or less.

Section 180.2(b)3C

- C. Water-heating system. The water-heating system shall meet one of the following:
 - i. A natural gas or propane water-heating system; or

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com



- ii. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that either meets the requirements of Section 110.12(a) or has an ANSI/CTA-2045-B communication port; or
- iii. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
- iv. If the existing water heater is an electric resistance water heater, a consumer electric water heater.
- v. A water-heating system determined by the Executive Director to use no more energy than the one specified in Sections 180.2(b)3Ci through iii above; or if no natural gas is connected to the existing water heater location, a water-heating system determined by the Executive Director to use no more energy than the one specified in Section 180.2(b)3Civ above.

In closing, we would like to thank the CEC for the opportunity to comment on the 45-day language. Please let me know if you have any questions or would like to schedule a meeting to discuss our comments further.

Respectfully Submitted,

Bradford White Corporation

Tom Gervais
Senior Director, Regulatory Affairs

Cc: Truskoski; L. Prader; M. Corbett; B. Ahee; B. Wolfer

Built to be the Best™

725 Talamore Drive • Ambler, PA 19002-1873 • 215-641-9400 • www.bradfordwhitecorporation.com

