



**BSR/ASHRAE/IES Addendum dc  
to ANSI/ASHRAE/IES Standard 90.1-2022**

**Public Review Draft**

# **Proposed Addendum dc to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low- Rise Residential Buildings**

**First Public Review (July 2025)  
(Draft Shows Proposed Changes to Current Standard)**

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## FOREWORD

This addendum updates the language in the Heat Pump water Heater Energy Credit to better align the credit with how commercial heat pump water heaters are tested under the US Department of Energy Test Procedure. The energy credit values have been re-calculated to reflect the changes in credit requirements for commercial equipment.

### Cost effectiveness

This addendum impacts an optional performance path in the Standard designed to provide increased flexibility and therefore was not subjected to cost effectiveness analysis.

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]*

## Addendum dc to 90.1-2022

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Modify Section 11.5.2.3.1 item b as follows

- b. **W02: Heat-Pump Water Heater.** To achieve this credit, air source heat-pump *water heaters* shall be installed according to the *manufacturer's* instructions, and at least 30% of design end-use *service water heating* requirements shall be met using only heat-pump heating at an ambient condition of 67.5°F(19.7°C) db without supplemental *electric resistance* or *fossil fuel* heating. For a hybrid heat-pump *water heater*, the heat-pump-only capacity shall be deemed at 40% of first hour draw. Where the heat-pump-only capacity exceeds 50% of the design end-use load, excluding *recirculating system* losses, the credits from the Section 11.5.3 tables shall be prorated as follows:

$$EC_{W02\_calc} = EC_{W02\_base} \times \frac{Cap_{HPWH}}{EndLoad \times 0.5} \quad (\text{not greater than } 2)$$

where

$EC_{W02\_calc}$  = energy credits achieved for heat-pump *water heater*.  $EC_{W02\_calc}$  shall not be greater than  $2.0 \times EC_{BASE}$

$EC_{W02\_base}$  = W02 base energy credit from Section 11.5.3

$Cap_{HPWH}$  = heat-pump-only capacity at ~~50°F(10°C)~~ 80.6°F(27°C) entering air and 70°F(21°C) without supplemental *electric resistance* or *fossil fuel* heat, Btu/h

$EndLoad$  = end-use peak hot-water load, excluding load for *heat trace* or recirculation, Btu/h The heat-pump *service water heating system* shall comply with the following requirements:

1. For central *systems* with an installed total output capacity of more than 100,000 Btu/h at an ambient condition of 67.5°F(19.7°C) db, a preheat storage tank with  $\geq 0.75$  gal per 1000 Btu/h of design end-use *service water heating* requirements shall be heated only with heat-pump heating when the ambient temperature is  $> 45^\circ\text{F}(7.2^\circ\text{C})$
2. For *systems* with *piping* temperature maintenance, either a *heat trace system* or a separate *water heater* in series for *recirculating system* and final heating shall be installed.

3. Heat-pump water heater efficiency shall meet or exceed one of the following:
  - i. Output-capacity-weighted-average uniform *energy factor* (UEF) of 3.0 with a medium draw pattern in accordance with 10 CFR 430 Appendix E.
  - ii. Output-capacity-weighted-average COP of not less than 4.0 tested at ~~50°F(10°C)~~ 80.6°F(27°C) entering air and 70°F(21°C) entering water in accordance with ~~AHRI Standard 1300~~ Subpart G to 10 CFR Part 431.

Table 11.5.3-1 Energy Credits for Multifamily

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	46	47	20	20	24	25	30	29	36	33	33	39	36	36	41	35	37	37	38
W02	Heat Pump Water Heater	11.5.2.3.1.b	13	13	16	15	22	20	20	21	27	15	24	19	14	19	25	12	13	11	3

Table 11.5.3-2 Energy Credits for Health Care Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
W02	Heat Pump Water Heater	11.5.2.3.1.b	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2

Table 11.5.3-3 Energy Credits for Hotel/Motel

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	5	5	7	6	8	8	10	10	11	12	11	13	13	12	14	13	13	14	14
W02	Heat Pump Water Heater	11.5.2.3.1.b	12	12	13	13	13	14	13	14	13	12	13	12	12	12	11	11	11	10	10

Table 11.5.3-4 Energy Credits for Office Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2
W02	Heat Pump Water Heater	11.5.2.3.1.b	2	2	3	3	3	3	3	4	3	3	4	3	3	3	4	3	3	3	3

Table 11.5.3-5 Energy Credits for Restaurant Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	2	3	3	3	4	5	6	6	7	8	7	9	9	9	10	9	10	10	10
W02	Heat Pump Water Heater	11.5.2.3.1.b	10	10	11	11	11	12	10	12	12	9	11	9	8	9	8	7	8	7	5

Table 11.5.3-6 Energy Credits Retail Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	2	2	2	2	3	2	2	3	2	2	3	2	2	2	2
W02	Heat Pump Water Heater	11.5.2.3.1.b	2	2	3	2	3	3	3	2	4	2	2	2	2	2	1	2	2	1	1

Table 11.5.3-7 Energy Credits Education Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	4	4	4	4	2	2	2	2	2	2	3	3	3	3	3
W02	Heat Pump Water Heater	11.5.2.3.1.b	2	2	3	3	3	3	3	3	4	3	3	3	2	3	3	2	2	2	2

Table 11.5.3-8 Energy Credits for Warehouses

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
W02	Heat Pump Water Heater	11.5.2.3.1.b	3	2	4	3	4	3	2	3	7	1	2	1	0	1	1	0	0	0	0

Table 11.5.3-9 Energy Credits for Other Buildings

ID	Energy Credit Measure	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W02	Heat Pump Water Heater	11.5.2.3.1.b	4	4	4	4	5	6	7	6	8	8	7	9	8	8	9	8	9	9	9
W02	Heat Pump Water Heater	11.5.2.3.1.b	6	6	7	6	8	8	7	8	9	6	8	6	5	6	7	5	5	4	3