ADDENDA

ANSI/ASHRAE/IES Addendum j to
ANSI/ASHRAE/IES Standard 90.1-2022

Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE and the American National Standards Institute on February 29, 2024, and by the Illuminating Engineering Society on January 26, 2024.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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FOREWORD

Addendum j adds the Mechanical System Performance Rating Method as a more flexible HVAC energy credit measure. This is an alternative to the simplified efficiency measures H02 and H03, and also is an alternative to measure H05 ground source heat pump and measure H06 dedicated outdoor system. Those measures remain in the energy credits, so they can be used alternatively for a project without using the Mechanical System Performance Rating Method.

Similar to the Improved Envelope Performance energy credit measure (E01), H01 reflects the system energy impact of the proposed mechanical system compared to a target system. When the total system performance ratio (TSPR) is greater than the target system, it indicates energy savings. Energy credits based on a 5% overall increase in delivered HVAC ideal energy are included in the tables. Since the change in TSPR reflects the change in HVAC energy cost, energy credits are determined based on the HVAC percentage of total building energy cost. HVAC energy cost is calculated based on the Standard 90.1-2022 progress indicator prototype simulations with the following results:

HVAC energy cost as a percentage of total building energy cost.

Bldg. Use CZ:	0A	1A	2A	3A	4A	5A	6A	0B	1B	2B	3B	4B	5B	6B	7	8	3C	4C	5C
Office	46%	40%	36%	32%	30%	32%	38%	46%	42%	36%	32%	30%	30%	34%	36%	44%	22%	22%	22%
Multifamily	46%	42%	32%	24%	26%	24%	26%	44%	38%	30%	26%	20%	22%	22%	24%	26%	10%	18%	12%
Hotel/Motel	54%	50%	46%	38%	34%	32%	34%	52%	48%	40%	36%	32%	32%	32%	36%	40%	30%	24%	26%
Education	64%	56%	52%	44%	40%	38%	42%	62%	58%	46%	40%	36%	36%	36%	42%	44%	36%	30%	30%
Retail	64%	54%	48%	44%	44%	44%	50%	62%	58%	46%	40%	40%	42%	46%	48%	50%	32%	36%	36%

The energy credits can be prorated between a 5% and 20% increase in TSPR, reflecting an improvement in overall HVAC system performance.

Cost-effectiveness was not considered for this measure, as it is another option among many that can be applied to meeting energy credit requirements, and those requirements are not increased by this proposal.

Informative Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum j to Standard 90.1-2022

Modify the standard as follows (IP and SI Units)

11.5.2.2 Improved HVAC Performance. ~~To achieve these credits, *equipment* shall provide HVAC performance improvement in accordance Sections 11.5.2.2.2, 11.5.2.2.3, 11.5.2.2.4, 11.5.2.2.5,11.5.2.2.6.~~ *Equipment* shall ~~also~~ meet applicable requirements of Sections 6.4 and 6.5. Credits shall be as shown in Section 11.5.3 or as specified in each subsection for *building* use types where base credits are included in Section 11.5.3 tables. ~~Use of multiple credits from this section shall be allowed.~~ Systems are permitted to achieve HVAC energy credits by meeting the requirements of one of the following:

a. Section 11.5.2.2.1, H01
b. Section 11.5.2.2.2, H02
c. Section 11.5.2.2.3, H03
d. Section 11.5.2.2.4, H04
e. Section 11.5.2.2.5, H05
f. Section 11.5.2.2.6, H06
g. Section 11.5.2.2.7, H07
h. Any combination of H02, H03, H04, H05, H06, and H07
i. Any combination of H01, H04, and H07

11.5.2.2.1 H01: HVAC System Performance Improvement ~~(Reserved).~~ For systems allowed to use Section 6.6.2, "Mechanical System Performance Path," the savings ($TSPR_{sav}$) from the proposed *TSPR* compared to the $TSPR_r$/MPF calculated in accordance with Normative Appendix L and Section 6.6.2.2 shall be 5% or more. Where the improvement is more than 5%, base energy credits from Tables 11.5.3-1 through 11.5.3-9 are permitted to be prorated up to a 20% improvement as follows:

$$EC_{H01\_adj} = EC_{H01\_base} \times \frac{TSPR_{sav}}{0.05} \times Area_{TSPR}$$

The range of allowed credit adjustment shall be limited as follows:

$$0.05 \le TSPR_{sav} \le 0.20$$

where

EC_{H01_adj} = energy credits achieved for improved mechanical system performance

EC_{H01_base} = H01 base energy credit from Section 11.5.3

$TSPR_{sav}$ = $1 - (TSPR_r / \text{MPF}) / TSPR_p$

where

$TSPR_p$ = proposed *TSPR* calculated in accordance with Normative Appendix L

$TSPR_r$ = reference *TSPR* calculated in accordance with Normative Appendix L

MPF = mechanical performance factor from Table 6.6.2.2 based on climate zone and *building* use type. Where a *building* has multiple *building* use types, MPF shall be area weighted as described in Section 6.6.2.2.

$Area_{TSPR}$ = (Floor area in *TSPR* calculation)/(Total conditioned building floor area)

Insert base energy credit rows for measure H01 in Tables 11.5.3-1 through 11.5.3-9 as shown.

Table 11.5.3-1 Energy Credits for Multifamily

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	23	22	21	19	16	15	12	13	5	13	10	9	12	11	6	13	11	12	13

Table 11.5.3-2 Energy Credits for Health Care Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×

Table 11.5.3-3 Energy Credits for Hotel/Motel

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	27	26	25	24	23	20	19	18	15	17	16	12	16	16	13	17	16	18	20

Table 11.5.3-4 Energy Credits for Office Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	23	23	20	21	18	18	16	16	11	15	15	11	16	15	11	19	17	18	22

Table 11.5.3-5 Energy Credits for Restaurant Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×

Table 11.5.3-6 Energy Credits for Retail Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	32	31	27	29	24	23	22	20	16	22	20	18	22	21	18	25	23	24	25

Table 11.5.3-7 Energy Credits for Education Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	32	31	28	29	26	23	22	20	18	20	18	15	19	18	15	21	18	21	22

Table 11.5.3-8 Energy Credits for Warehouses

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×

Table 11.5.3-9 Energy Credits for Other Buildings

ID	Energy Credit Abbreviated Title	Section	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
H01	HVAC Performance	11.5.2.2.1	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×

Modify Normative Appendix L as shown.

L2.1.5 Calculating TSPR. $TSPR_p$ shall be calculated according to Equation L-1:

$$TSPR_r = \frac{\text{Loads}_r}{\text{HVACinput}_p} \quad \text{(L-1)}$$

$$TSPR_p = \frac{\text{Loads}_r}{\text{HVACinput}_p} \quad \text{(L-1)}$$

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