ADDENDA

ANSI/ASHRAE/IES Addendum h 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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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
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FOREWORD

Section 6, "Heating, Ventilation, and Air Conditioning," and Section 7, "Service Water Heating," have many efficiency requirements where an exception is provided if some portion of the annual space heating or service water heating provided by a given system is met with on-site renewables.

With the addition of on-site renewable energy requirements in Section 10.5, and the opportunity to use on-site renewable energy to earn energy credits in Section 11, the current language could allow double counting, where the on-site renewable energy is used both to meet requirements and gain an exception to efficiency requirements. Addendum h removes that possibility by adding language that states that on-site renewable energy used to meet the requirements in Section 10 or to gain energy credits in Section 11 cannot be used to meet the exception.

The addendum's intent is only to address the potential double counting of efficiency exceptions for on-site renewable resources. The subsections to which the exception applies are shown in their entirety to provide context to commenters and do not fall within the scope of the addendum. Subsequently, this Addendum h clarifies the energy use discussed in each exception as annual energy. Commenters who would like to suggest changes to the main text are encouraged to submit a Continuous Maintenance Proposal at www.ashrae.org/technical-resources/standards-and-guidelines/standards-and-guidelines-under-continuous-maintenance.

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 h to Standard 90.1-2022

Modify Section 6.5.2.1 as shown (I-P and SI).

6.5.2.1 Zone Controls. Zone *thermostatic control* shall prevent *reheating*;

a. *recooling*;
b. mixing or simultaneously supplying air that has been previously mechanically heated and air that has been previously cooled, either by *mechanical cooling* or by economizer *systems*; and
c. other simultaneous operation of heating and cooling *systems* to the same zone.

Exceptions to 6.5.2.1:

[. . .]

4. Zones where at least 75% of the annual *energy* for *reheating* or for providing warm air in mixing *systems* is provided from *site-recovered energy* (including condenser heat) or *on-site renewable energy*. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

Modify Section 6.5.2.3 as shown (I-P and SI).

6.5.2.3 Dehumidification. Where humidity controls are provided, such controls shall prevent *reheating*, mixing of hot and cold airstreams, or other means of simultaneous heating and cooling of the same airstream.

Exceptions to 6.5.2.3:

[. . .]

5. At least 90% of the annual energy for reheating or for providing warm air in mixing systems is provided from site-recovered energy (including condenser heat) or *on-site renewable energy*. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

[. . .]

Modify Section 6.5.3.5 as shown (I-P and SI).

6.5.3.5 Supply Air Temperature Reset Controls. Multiple zone *HVAC systems* shall include controls that are capable of and configured to *automatically reset* the supply air temperature in response to represen-

tative *building* loads or *outdoor air* temperature. The controls shall *reset* the supply air temperature at least 25% of the difference between the design supply air temperature and the design room air temperature. Controls that adjust the *reset* based on zone humidity are allowed in Climate Zones 0B, 1B, 2B, 3B, 3C, and 4 through 8. *HVAC zones* that are expected to experience relatively constant loads shall have maximum airflow designed to accommodate the fully *reset* supply air temperature.

Exceptions to 6.5.3.5:

[. . .]

5. *Systems* in which at least 75% of the annual *energy* for *reheating* ~~(on an annual basis)~~ is from *site recovered energy* or *on-site renewable energy*. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

Modify Section 6.5.4.8 as shown (I-P and SI).

6.5.4.8 Buildings with High-Capacity Space-Heating Gas Boiler Systems. New *buildings* with gas hot-water *boiler systems* for *space* heating with a total *system* input of at least 1,000,000 Btu/h but not more than 10,000,000 Btu/h shall comply with Sections 6.5.4.8.1 and 6.5.4.8.2.

Exceptions to 6.5.4.8:

1. Where 25% of the annual *space* heating requirement is provided by *on-site renewable energy*, *site-recovered energy*, or heat recovery chillers. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

Modify Section 6.5.6.1.2 as shown (I-P and SI).

6.5.6.1.2 Spaces Other than Nontransient Dwelling Units. Each fan *system* serving *spaces* other than *nontransient dwelling units* shall have an *energy* recovery *system* where the design supply fan airflow rate exceeds the value listed in Tables 6.5.6.1.2-1 and 6.5.6.1.2-2, based on the climate zone and percentage of *outdoor air* at design airflow conditions. Table 6.5.6.1.2-1 shall be used for all *ventilation systems* that operate less than 8000 hours per year, and Table 6.5.6.1.2-2 shall be used for all *ventilation systems* that operate 8000 or more hours per year.

Exceptions to 6.5.6.1.2:

[. . .]

3. Heating *energy* recovery where more than 60% of the annual *outdoor air* heating *energy* is provided from *site-recovered energy* or *on-site renewable energy* in Climate Zones 5 through 8. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

[. . .]

Modify Section 6.5.6.2 as shown (I-P and SI).

6.5.6.2 Heat Recovery for Service Water Heating

6.5.6.2.1 Condenser heat recovery *systems* shall be installed for heating or preheating of service hot water provided all of the following are true:

a. The facility operates 24 hours a day.
b. The total installed heat-rejection capacity of the water-cooled *systems* exceeds 6,000,000 Btu/h of heat rejection.
c. The design *service water-heating* load exceeds 1,000,000 Btu/h.

6.5.6.2.2 The required heat recovery *system* shall have the capacity to provide the smaller of

a. 60% of the peak heat-rejection load at *design conditions* or
b. preheat of the peak service hot
c. water draw to 85°F.

Exceptions to 6.5.6.2.2:

1. Facilities that employ condenser heat recovery for *space* heating with a heat recovery design exceeding 30% of the peak water-cooled condenser load at *design conditions*.
2. Facilities that provide 60% of their annual *service water heating* from *on-site renewable energy* or *site-recovered energy* or from other sources. The portion of *on-site renewable energy* used to meet this

exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

Modify Section 7.4.5.2 as shown (I-P and SI).

7.4.5.2 Pool Covers. Heated *pools* shall be equipped with a vapor retardant *pool* cover on or at the water surface. *Pools* heated to more than 90°F shall have a *pool* cover with a minimum insulation value of R-12.

Exception to 7.4.5.2: *Pools* deriving over 60% of the annual *energy* for heating from *site-recovered energy* or *on-site renewable energy*. The portion of *on-site renewable energy* used to meet this exception shall not be used to meet the *on-site renewable energy* requirements in Section 10 or to earn *on-site renewable energy* credits in Section 11.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

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