ANSI/ASHRAE/IES Addendum bh to ANSI/ASHRAE/IES Standard 90.1-2019

Energy Standard for Buildings Except Low-Rise Residential Buildings


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- c. offering constructive criticism for improving the Standard, or
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FOREWORD

Addendum bh changes the on-site photovoltaic system parameter for temperature coefficient of power described in Section 11, Table 11.5.1[15]. The parameters described in this section are used to determine the amount of on-site renewable energy to be included in the energy cost budget when a proposed design does not include an on-site renewable energy system. The parameters were originally proposed to align with default inputs for a standard efficiency solar panel in PV Watts, a commonly used tool for estimating annual photovoltaic generation. In aligning baseline requirements with PV Watts inputs, the intent was to make it easy for an energy analyst to estimate the required on-site generation for the energy cost budget in those cases when the proposed design did not include an on-site renewable energy system.

During public review of Addendum ck, the panel efficiency was updated from 15% to 19% to more closely align with the average panel efficiency being used in the U.S. marketplace. In making that update the temperature coefficient of power was not similarly updated. The default temperature coefficient of power in PV Watts for a 19% efficient panel is –0.35%/°C. This change makes it easier for users of Section 11 to quickly estimate the amount of on-site renewable energy to include in the Energy Cost Budget using the PV Watts tool or the PV Watts methodology that is embedded within some common energy simulation tools.

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.
On-site renewable energy in the proposed design shall be determined as follows:

- a. Where a complete system providing on-site renewable energy exists, the model shall reflect the actual system type using actual component capacities and efficiencies.
- b. Where a system providing on-site renewable energy has been designed, the system model shall be consistent with design documents.
- c. Where no system exists or is specified to provide on-site renewable energy, no system shall be modeled.

On-site renewable energy shall be included in the budget building design when required by Section 10.5.1 and shall be determined as follows:

- a. Where a system providing on-site renewable energy has been modeled in the proposed design, the same system shall be modeled identically in the budget building design except the rated capacity shall meet the requirements of Section 10.5.1.1. Where more than one type of on-site renewable energy system is modeled, the total capacities shall be allocated in the same proportion as in the proposed design.
- b. Where no system exists or is specified to provide on-site renewable energy in the proposed design, on-site renewable energy shall be modeled as an unshaded photovoltaic system with the following physical characteristics:
  - Size: Rated capacity per Section 10.5.1.1.
  - Module Type: Crystalline Silicon Panel with a glass cover, 19.1% nominal efficiency and temperature coefficient of \(-0.35\%/\degree C\), Performance shall be based on a reference temperature of 77°F (25°C) and irradiance of 317 Btu/h·ft² (1000 W/m²).
  - Array Type: Rack mounted array with installed nominal operating cell temperature (INOCT) of 103°F (45°C).
  - Total System Losses (DC output to AC output): 11.3%.
  - Tilt: 0-degrees (mounted horizontally).
  - Azimuth: 180 degrees.

If the on-site renewable energy system cannot be modeled in the simulation program, Section 11.4.5 shall be used.

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### Table 11.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget

<table>
<thead>
<tr>
<th>Proposed Design (Column A)</th>
<th>Budget Building Design (Column B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design Energy Cost (DEC)</strong></td>
<td><strong>Energy Cost Budget (ECB)</strong></td>
</tr>
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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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