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### **Request for Official Interpretation**

Thank you for your official interpretation request concerning 90.1-2022

#### **I. Section/Table Number**

Section 10.2.1

#### **II. Background Information**

Section 10.5 (Prescriptive Requirements) in ASHRAE 90.1-2022 Energy Standard for Buildings Except Low-Rise Residential Buildings is currently located under Section 10.2.1, “Requirements for All Compliance Paths.” This seems inconsistent with how other sections of the standard are organized (for example, Sections 5, 6, 7, and 9), where prescriptive requirements are clearly tied to the prescriptive compliance path rather than applying to all paths. Because of where it sits, Section 10.2 can be read to require meeting prescriptive requirements for renewable energy for all projects, including those using performance-based compliance paths like the Energy Cost Budget (ECB) method in Section 12. At the same time, Section 12 Table 12.5.1 (Proposed Building, Column 15c) and Appendix G Table G3.1 (Proposed Building, Column 18c) both make it clear that where no on-site renewable energy system is included in the proposed design, no system is modeled. That indicates that the performance paths anticipate cases where on-site renewable energy is not included in the proposed design. This approach is further supported in several SSPC 90.1 addenda to Standard 90.1-2019 that state as follows: - Addendum BH: “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.” - Addendum CP and CK: “The approach allows a proposed design that does not include renewable energy required by Section 10.5.1 a trade-off against other prescriptive requirements in the standard.” These addenda are further referenced in Part 7:ASHRAE/IES Standard 90.1-2022 Performance Path Changes of “ASHRAE Journal Special Series: Changes to Standard 90.1 Requirements” which states in reference to the new prescriptive requirement for on-site renewable energy, “This new prescriptive requirement prompted new rules for both the ECM and the PRM to allow buildings that cannot meet that requirement or allow limited credit to buildings that exceed it.” - Addendum CC: “This would require an equivalent area of photovoltaics less than 3% to 16% of roof area across the different building prototypes, although the specific type of on-site renewable energy resource and placement is left up to the designer or building owner and can also be traded off in the performance path. The structure used in ASHRAE 90.1-2025 also more clearly distinguishes prescriptive requirements from performance-based compliance paths, consistent with the above mentioned addenda. This creates some confusion about how Section 10.5 is intended to apply in the Standard 90.1-2022. If Section 10.5 is meant to apply to all compliance paths, it conflicts with the language in the ECB and PRM paths. If it is not meant to apply to performance paths, then its current placement under “Requirements for All Compliance Paths” is misleading and should be clarified.

#### **III. Interpretation**

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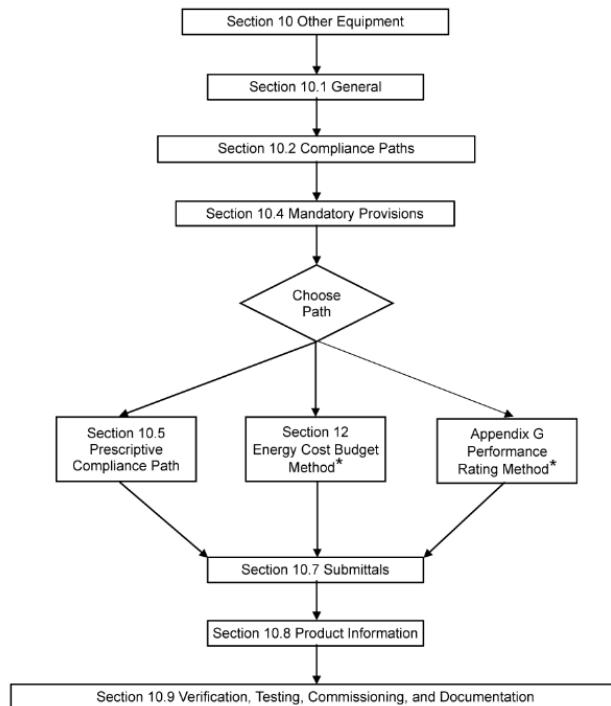
Please provide your interpretation of the requirement(s). Present your interpretation in such a way as to allow for a yes or no answer by the applicable committee. The question below will be presented to the applicable committee for response.

Section 10.5 is prescriptive and can be traded off with ECB or PRM.

#### IV. Supplementary information

Enter any additional information that provides additional context for your question (charts, drawings, etc).

#### 1. ASHRAE 90.1 2025 (more clearly distinguishes prescriptive requirements from performance-based compliance paths)



\*As permitted by Section 4.2.1

#### 10. OTHER EQUIPMENT

**10.2 Compliance Paths.** *Equipment* covered by this section shall comply with Sections 10.2.1 and 10.2.2.

**10.2.1 Requirements for All Compliance Paths.** *Equipment* covered by this section shall comply with the following:

- a. Section 10.1, “General”
- b. Section 10.4, “Mandatory Provisions”
  
- c. Section 10.7, “Submittals”
- d. Section 10.8, “Product Information”
- e. Section 10.9, “Verification, Testing, Commissioning, and Documentation”

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## 2. Part 7: ASHRAE/IES Standard 90.1-2022 Performance Path Changes of “ASHRAE Journal Special Series: Changes to Standard 90.1 Requirements”

modelers on what tables to use and the appropriate language changes.

### Renewable Energy (Addenda *ck, cp*)

A new prescriptive requirement in Standard 90.1-2022 requires on-site renewable energy of “not less than 0.50 W/ft<sup>2</sup> [5.4 W/m<sup>2</sup>] multiplied by the sum of the gross conditioned floor area for all floors up to the three largest floors,” with some exceptions. This new prescriptive requirement prompted new rules for both the ECBM and the PRM to allow buildings that cannot meet that requirement or allow limited credit to buildings that exceed it.

For ECBM, which already had a section on renewables, the existing 5% limit on renewable energy trade-offs has been changed to 5% in excess of the new required amount. To support this requirement, a new row was added to Table 12.5.1 that describes the configuration of on-site renewable energy systems that must be modeled in the budget design. For proposed designs that include the on-site renewable energy systems, the budget design must be modeled with renewable energy systems of the same system type but with capacity minimally compliant with the applicable

prescriptive requirements in Section 10.5.1.1. For proposed designs with no on-site renewable systems, the modeling assumptions for a default unshaded photovoltaic system to be modeled in the budget design are provided.

For PRM, Table G3.1 also has a new section on on-site renewable energy, but the baseline does not include renewable energy in this case. Instead, in Section 4, the Performance Cost Index Target (PCI<sub>t</sub>) equation has been modified to account for the prescriptively required renewable energy. Similar to the ECBM, the equation caps the contribution of renewable energy toward compliance at 5% over the prescriptively required amount. The equation also requires modeling the proposed design with a virtual, minimally code-compliant on-site renewable energy system in place of the specified system. Configuration of this virtual system is determined following the same rules as prescribed for the ECBM budget design.

### ECBM Economizers and Budget HVAC System Cleanup (Addendum *u*)

A significant change was made related to the type of economizer used in Section 12.5.2, HVAC Systems.

## 3. Addenda

- **Addenda BH** : *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.*

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**Revise Table 11.5.1 as shown (I-P and SI).**

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

<b>Proposed Design (Column A) Design Energy Cost (DEC)</b>	<b>Budget Building Design (Column B) Energy Cost Budget (ECB)</b>
[...]	[...]
<p><i>On-site renewable energy</i> in the <i>proposed design</i> shall be determined as follows:</p> <ol style="list-style-type: none"> <li>Where a complete <i>system</i> providing <i>on-site renewable energy</i> exists, the model shall reflect the actual <i>system</i> type using actual component capacities and efficiencies.</li> <li>Where a <i>system</i> providing <i>on-site renewable energy</i> has been designed, the <i>system</i> model shall be consistent with design documents.</li> <li>Where no <i>system</i> exists or is specified to provide <i>on-site renewable energy</i>, no <i>system</i> shall be modeled.</li> </ol>	<p><i>On-site renewable energy</i> shall be included in the <i>budget building design</i> when required by Section 10.5.1 and shall be determined as follows:</p> <ol style="list-style-type: none"> <li>Where a <i>system</i> providing <i>on-site renewable energy</i> has been modeled in the <i>proposed design</i>, the same <i>system</i> shall be modeled identically in the <i>budget building design</i> except the rated capacity shall meet the requirements of Section 10.5.1.1. Where more than one type of <i>on-site renewable energy system</i> is modeled, the total capacities shall be allocated in the same proportion as in the <i>proposed design</i>.</li> <li>Where no <i>system</i> exists or is specified to provide <i>on-site renewable energy</i> in the <i>proposed design</i>, <i>on-site renewable energy</i> shall be modeled as an unshaded photovoltaic system with the following physical characteristics:                             <ul style="list-style-type: none"> <li>• Size: Rated capacity per Section 10.5.1.1.</li> <li>• Module Type: Crystalline Silicon Panel with a glass cover, 19.1% nominal efficiency and temperature coefficient of <del>-0.47</del> <u>-0.35</u>%/°C, Performance shall be based on a reference temperature of 77°F (25°C) and irradiance of 317 Btu/h·ft<sup>2</sup> (1000 W/m<sup>2</sup>).</li> <li>• Array Type: Rack mounted array with installed nominal operating cell temperature (INOCT) of 103°F (45°C).</li> <li>• Total System Losses (DC output to AC output): 11.3%.</li> <li>• Tilt: 0-degrees (mounted horizontally).</li> <li>• Azimuth: 180 degrees.</li> </ul> </li> </ol> <p>If the <i>on-site renewable energy system</i> cannot be modeled in the <i>simulation program</i>, Section 11.4.5 shall be used.</p>
[...]	[...]

• [Addenda CP and CK \(Foreword\)](#)

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**FOREWORD**

*Addendum ck adds language to Section 11 to address new renewable energy requirements in Addendum by: **The approach allows a proposed design that does not include renewable energy required by Section 10.5.1 a trade-off against other prescriptive requirements in the standard. In that case, the renewable energy allowance included in the budget building design will be based on a horizontal photovoltaic array with a rated capacity equal to but not to exceed the requirement in Section 10.5.1.1. For proposed designs that include an on-site renewable energy system, the budget building design allowance will be based on the proposed renewable energy system design with a rated capacity equal to but not to exceed the requirement in Section 10.5.1.1.***

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

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- [Addenda CC \(Foreword\)](#)

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## FOREWORD

*Addendum cc increases the prescriptive on-site renewable energy requirement added in Section 10.5.1.1 by previously published Addendum by. An updated analysis demonstrated that the capacity requirement can be increased while passing the ASHRAE scalar assessment for cost effectiveness without tax incentives or subsidies and also considering roof space competition and self-utilization of the renewable energy within the building. In the PNNL prototype buildings, using a scalar value of 20 while also limiting electricity export back into the grid of no more than 0.5% of the total annual building electricity consumption actually justifies capacity values of at least the following values:*

- 1.5 W/ft<sup>2</sup> in A-2 and M occupancy groups
- 0.75 W/ft<sup>2</sup> in R, I, and E occupancy groups
- 0.75 W/ft<sup>2</sup> in B occupancy groups with IT equipment
- 0.50 W/ft<sup>2</sup> in other B occupancy groups including smaller offices
- 0.50 W/ft<sup>2</sup> in S occupancy groups
- 0.68 W/ft<sup>2</sup> in all other groups

*Therefore, a capacity requirement of 0.50 W/ft<sup>2</sup> was selected to be conservative. This would require an equivalent area of photovoltaics less than 3% to 16% of roof area across the different building prototypes, although the specific type of on-site renewable energy resource and placement is left up to the designer or building owner and can also be traded off in the performance path. Additionally, the existing exceptions are maintained.*

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

### Addendum cc to Standard 90.1-2019

**V. Question:** Section 10.5 is prescriptive and can be traded off with ECB or PRM. Is this interpretation correct?

*This question will be presented to the applicable project committee for a response*

**VI. Answer:**

*The cognizant Project Committee or Interpretation Committee will provide a yes or no answer.*

**Yes.**

**VII. Comments:**

*The cognizant Project Committee or Interpretation Committee may provide additional comments.*

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IC 90.1-2022-14

Approved on May 14, 2026

The renewable energy requirements were first introduced with the publication of Addenda BY, CK, CP to ANSI/ASHRAE/IES Standard 90.1-2019 in August 2020. During development of those addenda and in later development of updates in Addendum CC to ANSI/ASHRAE/IES Standard 90.1-2019 and Addenda K and AQ to ANSI/ASHRAE/IES Standard 90.1-2022, the clear intent has always been that the renewable energy requirements in section 10.5 are prescriptive and not mandatory requirements, and are able to be traded off in either the section 12 ECB or Appendix G performance paths. In addition to the clear labeling of section 10.5 as “Prescriptive Compliance Path”, this intent is also supported by the phrasing in Table 12.5.1 and Table G3.1 instructing the user what to do in cases “where no system exists or is specified to provide on-site renewable energy ...” confirming that it is not mandatory for every building to have on-site renewable energy systems compliant with section 10.5. The foreword to each addendum also indicated the intent that the renewable energy requirements are tradeable. However, the committee recognizes there is conflicting language in the directional language in 10.2. This has been corrected in ANSI/ASHRAE/IES Standard 90.1-2025, but the clear intent for both 90.1-2022 and 90.1-2025 is that the renewable energy requirements in section 10.5 are prescriptive, and not mandatory for all compliance paths.

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