
Standard for the Design of High-Performance Green Buildings

Except Low-Rise Residential Buildings

The Complete Technical Content of the International Green Construction Code®

Approved by the ASHRAE Standards Committee on June 26, 2020; by the ASHRAE Board of Directors on July 1, 2020; by the International Code Council on June 1, 2020; by the U.S. Green Building Council on June 3, 2020; by the Illuminating Engineering Society on July 1, 2020; and by the American National Standards Institute on July 31, 2020.

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

This addendum updates the source energy conversion factors in Table 7.5.3 and expands the list for eGRID subregions. These factors represent the energy required to extract, process, and deliver the fuel to the building per unit of energy contained in the fuel.

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 z to Standard 189.1-2017

Modify 7.5.3 as shown. The text being modified incorporates changes made previously to the standard by addenda e, k, and ar.

7.5.3 Zero Energy Performance Index. The zero energy performance index ($zEPI_{2004}$) of the proposed design, including on-site renewable energy systems, shall be less than the target ($zEPI_{2004,Target}$). $zEPI_{2004}$ and $zEPI_{2004,Target}$ shall be calculated as described below, follows:

\[
\begin{align*}
    r_i &= \text{source energy conversion factor for energy type } i, \text{ value taken from Table 7.5.2} \text{.} \\
    r_e &= \text{source energy conversion factor taken from Table 7.5.3 for electricity. eGRID values shall be used for electricity where applicable.}
\end{align*}
\]

Replace old Table 7.5.3 with new Table 7.5.3, “Source Energy Conversion Factors”; Add new Figure 7.5.3 for eGrid Subregions.

Table 7.5.3 - National Average Source Energy Conversion Factors

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>Conversion Factor, $r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity, imported</td>
<td>3.15</td>
</tr>
<tr>
<td>Electricity, exported renewable</td>
<td>3.15</td>
</tr>
<tr>
<td>Natural gas</td>
<td>1.09</td>
</tr>
<tr>
<td>Fuel oil (1, 2, 4, 5, 6, diesel, kerosene)</td>
<td>1.19</td>
</tr>
<tr>
<td>Propane and liquid propane</td>
<td>1.15</td>
</tr>
<tr>
<td>Steam</td>
<td>4.45</td>
</tr>
<tr>
<td>Hot water</td>
<td>1.35</td>
</tr>
<tr>
<td>Chilled water</td>
<td>1.04</td>
</tr>
<tr>
<td>Coal or other</td>
<td>1.05</td>
</tr>
</tbody>
</table>

The values in this table represent national averages for the United States.
### Table 7.5.3 Source Energy Conversion Factors

<table>
<thead>
<tr>
<th>Energy Form</th>
<th>Source Energy Conversion Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuels Used Directly in Building</strong></td>
<td></td>
</tr>
<tr>
<td>Natural gas</td>
<td>1.09</td>
</tr>
<tr>
<td>LPG or propane</td>
<td>1.15</td>
</tr>
<tr>
<td>Fuel oil (residual)</td>
<td>1.19</td>
</tr>
<tr>
<td>Fuel oil (distillate)</td>
<td>1.19</td>
</tr>
<tr>
<td>Coal</td>
<td>1.05</td>
</tr>
<tr>
<td>Gasoline</td>
<td>1.19</td>
</tr>
<tr>
<td>Other fuels not specified in this table</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>Imported Electricity and Exported Renewable Electricity</strong></td>
<td></td>
</tr>
<tr>
<td>AKGD—ASCC Alaska Grid</td>
<td>2.52</td>
</tr>
<tr>
<td>AKMS—ASCC Miscellaneous</td>
<td>1.21</td>
</tr>
<tr>
<td>AZNM—WECC Southwest</td>
<td>2.75</td>
</tr>
<tr>
<td>CAMX—WECC California</td>
<td>1.94</td>
</tr>
<tr>
<td>ERCT—ERCOT All</td>
<td>2.58</td>
</tr>
<tr>
<td>FRCC—FRCC All</td>
<td>2.97</td>
</tr>
<tr>
<td>HIMS—HICC Miscellaneous</td>
<td>2.86</td>
</tr>
<tr>
<td>HIOA—HICC Oahu</td>
<td>3.83</td>
</tr>
<tr>
<td>MROE—MRO East</td>
<td>3.08</td>
</tr>
<tr>
<td>MROW—MRO West</td>
<td>2.50</td>
</tr>
<tr>
<td>NEWE—NPCC New England</td>
<td>2.87</td>
</tr>
<tr>
<td>NWPP—WECC Northwest</td>
<td>1.39</td>
</tr>
<tr>
<td>NYCW—NPCC NYC/Westchester</td>
<td>2.92</td>
</tr>
<tr>
<td>NYLI—NPCC Long Island</td>
<td>2.90</td>
</tr>
<tr>
<td>NYUP—NPCC Upstate NY</td>
<td>1.97</td>
</tr>
<tr>
<td>RFCE—RFC East</td>
<td>3.05</td>
</tr>
<tr>
<td>RFCM—RFC Michigan</td>
<td>3.06</td>
</tr>
<tr>
<td>RFCW—RFC West</td>
<td>3.14</td>
</tr>
<tr>
<td>RMPA—WECC Rockies</td>
<td>2.33</td>
</tr>
<tr>
<td>SPNO—SPP North</td>
<td>2.67</td>
</tr>
<tr>
<td>SPSO—SPP South</td>
<td>2.46</td>
</tr>
<tr>
<td>SRMV—SERC Mississippi Valley</td>
<td>2.95</td>
</tr>
<tr>
<td>SRMW—SERC Midwest</td>
<td>3.20</td>
</tr>
<tr>
<td>SRSO—SERC South</td>
<td>3.04</td>
</tr>
<tr>
<td>SRTV—SERC Tennessee Valley</td>
<td>3.02</td>
</tr>
<tr>
<td>SRVC—SERC Virginia/Carolina</td>
<td>3.11</td>
</tr>
<tr>
<td>All other electricity</td>
<td>2.64</td>
</tr>
<tr>
<td><strong>District Thermal Energy</strong></td>
<td></td>
</tr>
<tr>
<td>Chilled water</td>
<td>0.63</td>
</tr>
<tr>
<td>Steam</td>
<td>1.83</td>
</tr>
<tr>
<td>Hot water</td>
<td>1.73</td>
</tr>
</tbody>
</table>

*Informative Note: Values in this table represent averages for the United States and include both direct and indirect emissions.*
Figure 7.5.3 Map of eGRID subregions.
Crosshatching indicates that an area falls within overlapping eGRID subregions due to the presence of multiple electric service providers. Power Profiler can be used to definitively determine the eGRID subregion associated with a specific location and electric service provider (www.epa.gov/energy/power-profiler).
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.
Standard 189.1 and the International Green Construction Code

Standard 189.1 serves as the complete technical content of the International Green Construction Code® (IgCC). The IgCC creates a regulatory framework for new and existing buildings, establishing minimum green requirements for buildings and complementing voluntary rating systems. For more information, visit www.iccsafe.org.

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