

Public Review Draft

Proposed Addendum aa to Standard 189.1-2017

Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

First Public Review (March 2019)
(Draft Shows Proposed Changes to Current Standard)

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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

Foreword

This addendum updates the CO₂e emission factors in Table 7.5.2, expanding the list to add values for eGRID subregions. The table is also moved to Section 7.5.3 in expectation of being combined with source energy factor updates being added separately by Addendum z.

The emission factors include both direct emissions from combustion and indirect emissions from extraction, processing and delivery of fuels to buildings or power plants. For electricity, the emissions also account for transmission and distribution losses.

Note: In this addendum, changes to the current standard as modified by previous addenda 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. Only the changes shown as Addendum aa are open for review and comment at this time. Other addenda and any other additional material is provided for context only and is not open for comment except as it relates to the proposed substantive changes of this addendum.

Addendum aa to 189.1-2017

Note to Reviewer: Section 7.5 of Standard 189.1 is being modified by multiple addenda. Addendum ar to 189.1-2014 and Addendum e to 189.1-2017 have received all approvals for publication, but have not yet been published and are therefore not available to reviewers of Addendum aa. Addendum k has completed public review and is in the process of comment response and resolution.

This section of this addendum shows changes being made by Addendum aa relative to Section 7.5 from 189.1-2017 including modifications from Addendum ar, Addendum e and Addendum k, i.e., material from ar, e and k are shown as the base document. The changes in this first section are what are open for public review. Because Addenda ar, e and k have not yet been published, those addenda are shown in subsequent sections for information only. Changes made to Appendix C by Addendum k are not shown, as this addendum does not affect them.

It should be noted that Addendum z makes further changes to Section 7.5.3. If all five of these addenda are approved for publication, the resulting Section 7.5 is shown at the end of this document. Addendum z adds Table 7.5.3 with source energy factors and Addendum aa adds Table 7.5.3 with CO_{2e} emission factors. Both versions of Table 7.5.3 have identical rows and if both addenda are approved the different columns in Table 7.5.3 from the two addenda will be combined editorially, as shown in the last section of this addendum.

7.5 Performance Option

7.5.1 Annual Energy Cost. The *proposed building performance* cost index with consideration of renewables shall be calculated in accordance with ANSI/ASHRAE/IES Standard 90.1, Normative Appendix G, and be equal to or less than the Performance Cost Index (PCI) Target, as determined from the following equation:

$$PCI_{Target} = \frac{[BBUEC + (BBREC \times BPF)] \times (1 - RF)}{BBUEC + BBREC}$$

where

PCI_{Target} = target PCI required for achieving compliance with the standard, unitless.

BBUEC = the component of *baseline building performance* that is due to *unregulated energy use*, \$

BBREC = the component of *baseline building performance* that is due to *regulated energy use*, or *baseline building performance* minus BBUEC, \$

BPF = building performance factor taken from Table 7.5.1, unitless

RF = renewable energy production fraction from Table 7.5.1, unitless

The proposed building PCI, without consideration of renewables, shall comply with the requirements of ANSI/ASHRAE/IES Standard 90.1, Section 4.2.1.1.

7.5.2 Annual Carbon Dioxide Equivalent (CO_{2e}). The *proposed design* shall have annual CO_{2e} emissions equal to or less than the annual CO_{2e} emissions of the *baseline building design* multiplied by the performance cost index target determined in accordance with 7.5.1. To determine the annual CO_{2e} for each energy source in the *baseline building design* and *proposed design*, the energy consumption shall be multiplied by the CO_{2e} emission factors from Table 7.5.3B. eGRID values shall be used for electricity where applicable.

Table 7.5.1 Building Performance Factors (BPF) and Renewable Fractions (RF)

Building Type	Building Performance Factor (BPF)	Renewable Fraction (RF)
Multifamily	0.71	0.50
Healthcare/hospital	0.56	0.35
Hotel/motel	0.58	0.50
Office	0.54	0.50
Restaurant	0.59	0.10
Retail	0.50	0.50
School	0.37	0.50
Semiheated warehouse ^a	0.44	0.50
All Others	0.54	0.50

a. Conditioned warehouses shall use the "All others" category.

Table 7.5.2 CO₂e Emission Factors

Building Project Energy Source	CO ₂ e, lb/MWh	CO ₂ e, kg/MWh
Grid delivered electricity and other fuels not specified in this table	1348	612
LPG or propane	601	273
Fuel oil (residual)	685	311
Fuel oil (distillate)	663	301
Coal	820	372
Gasoline	681	309
Natural gas	509	231
District chilled water	323	146
District steam	855	388
District hot water	807	366

The values in this table represent national averages for the United States and include both direct and indirect emissions.

7.5.3 Zero Energy Performance Index. The zero energy performance index (zEPI₂₀₀₄) of the proposed design, including on-site renewable energy systems, shall be less than the target (zEPI_{2004,Target}). zEPI₂₀₀₄ and zEPI_{2004,Target} shall be calculated as described below.

$$zEPI_{2004} = \frac{\sum_i PDSE_i \times r_i - \sum_k RE_k \times REPF_k \times r_e}{\sum_i BBSE_i \times r_i}$$

where

zEPI₂₀₀₄ = Zero energy performance index relative to the Standard 90.1 baseline as defined in the performance rating method of Appendix G.

PDSE_i = Proposed design site energy use for energy type i.

BBSE_i = Baseline building site energy use for energy type i. The baseline building is created following the rules in Standard 90.1, Appendix G.

r_i = Source energy conversion factor for energy type i, taken from Table 7.5.3A.

RE_k = Annual renewable energy electricity production for renewable energy procurement method k (see Table 7.4.1.2)

REPF_k = Renewable energy factor from Table 7.4.1.2 for renewable energy procurement method k

r_e = Source energy conversion factor taken from Table 7.5.3A for electricity.

Informative Note: On-site thermal energy and renewable energy contributions to district energy plants are accounted for in the PDE_i term through reductions in electricity and/or gas use. The RE_k term will always be electricity.

$$zEPI_{2004\ Target} = \frac{[BBUSE + (BBRSE \times BPF)] \times (1 - RF)}{BBUSE + BBRSE}$$

where

zEPI_{2004 Target} = Zero energy performance index target required for achieving compliance with the standard, unitless.

BBUSE = Baseline building *unregulated energy use* expressed in source units.

BBRSE = Baseline building *regulated energy use* expressed in source units.

BPF = Building performance factor taken from Table 7.5.1, unitless.

RF = Renewable fraction from Table 7.5.1, unitless.

Informative Note: Informative Appendix I details a methodology for converting zEPI2004 to zEPI. zEPI2004 uses Standard 90.1 Appendix G to define the baseline building. The traditional definition of zEPI uses the median energy of the existing building stock in the year 2000 as the baseline. The traditional zEPI definition is used by the Architecture 2030 program and for other programs.

TABLE 7.5.3A National Average Source Energy Conversion Factors

Energy Type	Conversion Factor (r)
Imported Electricity	3.15
Exported Renewable Electricity	3.15
Natural Gas	1.09
Fuel Oil (1,2,4,5,6,Diesel, Kerosene)	1.19
Propane & Liquid Propane	1.15
Steam	1.45
Hot Water	1.35
Chilled Water	1.04
Coal or Other	1.05

Informative Note: The values in this table represent national averages for the United States..

TABLE 7.5.3B CO₂e Emissions Factors

Energy Form	CO₂e Emission Factor	
	lb/MWh	kg/MWh
Fossil Fuels Used Directly in Building		
Natural gas	681	309
LPG or propane	651	295
Fuel oil (residual)	738	335
Fuel oil (distillate)	715	324
Coal	892	405
Gasoline	744	337
Electricity		
AKGD - ASCC Alaska Grid	1,580	717
AKMS - ASCC Miscellaneous	738	335
AZNM - WECC Southwest	1,496	679
CAMX - WECC California	957	434
ERCT - ERCOT All	1,529	694
FRCC - FRCC All	1,601	726
HIMS - HICC Miscellaneous	1,717	779
HIOA - HICC Oahu	2,460	1,116
MROE - MRO East	2,337	1,060
MROW - MRO West	1,686	765
NEWE - NPCC New England	1,024	464
NWPP - WECC Northwest	936	425
NYCW - NPCC NYC/Westchester	1,034	469
NYLI - NPCC Long Island	1,600	726
NYUP - NPCC Upstate NY	540	245
RFCE - RFC East	1,156	524
RFCM - RFC Michigan	1,806	819
RFCW - RFC West	1,757	797
RMPA - WECC Rockies	1,829	830
SPNO - SPP North	1,851	840
SPSO - SPP South	1,737	788
SRMV - SERC Mississippi Valley	1,421	645
SRMW - SERC Midwest	2,234	1,014
SRSO - SERC South	1,651	749
SRTV - SERC Tennessee Valley	1,677	761
SRVC - SERC Virginia/Carolina	1,255	569
All other electricity and other fuels not specified in this table	1,418	643
District Thermal Energy		
Chilled water	339	154
Steam	1,145	519
Hot water	1,081	491

Informative Note: Values in this table represent averages for the United States and include both direct and indirect emissions.

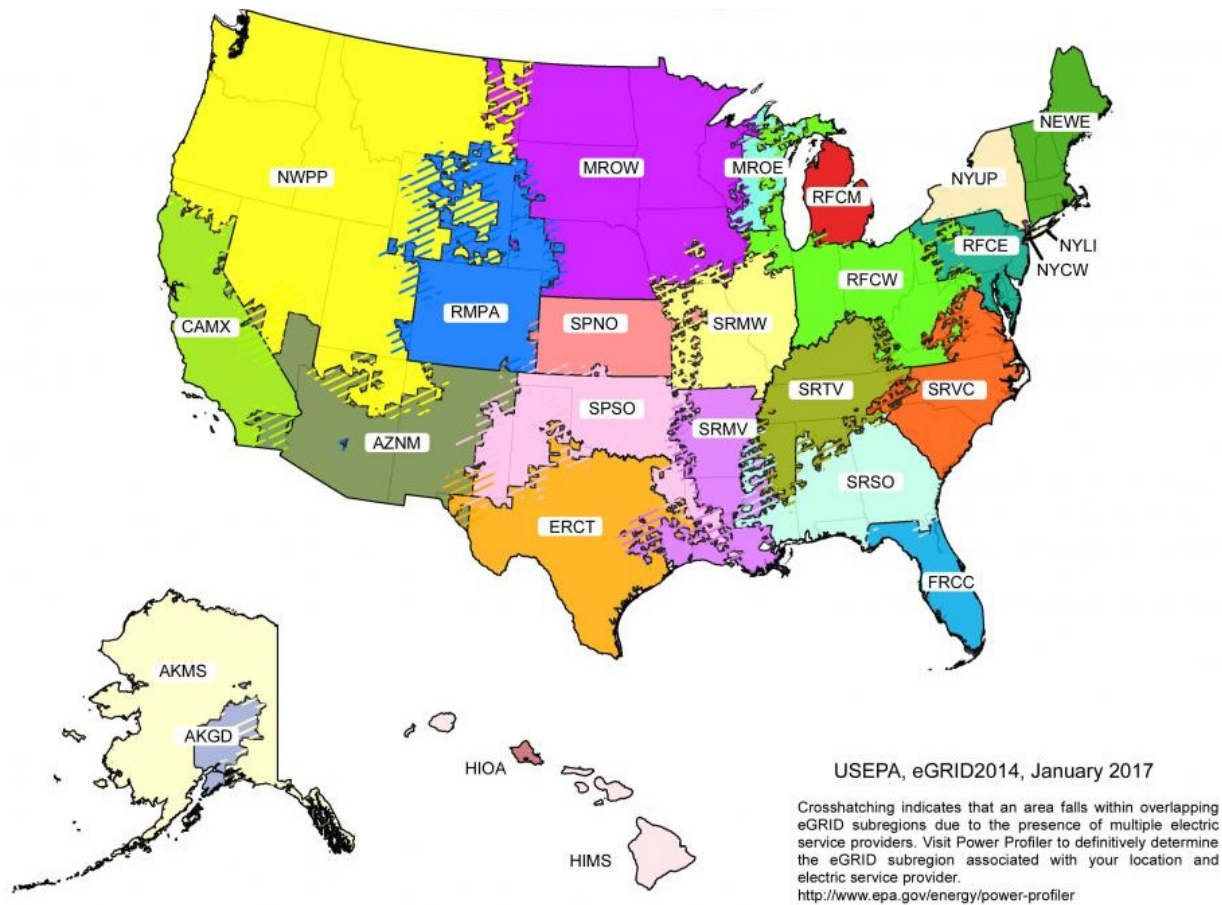


Figure 7.5.3 Map of eGRID Subregions

Crosshatching indicates that an area falls within overlapping eGRID subregions due to the presence of multiple electric service providers. Visit Power Profiler to definitively determine the eGRID subregion associated with your location and electric service provider. See <http://www.epa.gov/energy/power-profiler>.

Addendum k to 189.1-2017

Note to reviewers: The first section of this addendum shows changes being made by this addendum relative to Section 7.5 from 189.1-2017 including modifications from Addendum ar, Addendum e and Addendum k, i.e., material from ar, e and k are shown as the base document. The changes open for public review are those in the first section.

This section of the addendum shows Addendum k for informational purposes. These changes are shown with Standard 189.1-2017 plus Addendum ar and Addendum e as the base document. The changes shown in this section are not open for public review.

7.5 Performance Option

7.5.1 Annual Energy Cost. The proposed building performance cost index with consideration of renewables shall be calculated in accordance with ANSI/ASHRAE/IES Standard 90.1, Normative Appendix G, and be equal to or less than the Performance Cost Index (PCI) Target, as determined from the following equation:

$$PCI_{Target} = \frac{[BBUEC + (BBREC \times BPF)] \times (1 - RF)}{BBUEC + BBREC}$$

$$PCI_{Target} = \frac{BBUEC + (BBREC \times BPF) - REC}{BBUEC + BBREC}$$

where

PCI_{Target} = target PCI required for achieving compliance with the standard, unitless.

BBUEC = the component of *baseline building performance* that is due to *unregulated energy use*, \$

BBREC = the component of *baseline building performance* that is due to *regulated energy use*, or *baseline building performance* minus BBUEC, \$

BPF = building performance factor taken from Table 7.5.17-5.2A, unitless.

~~RECRF = renewable energy production fraction from Table 7.5.1, unitless determined from Section 7.4.1.1.1 and converted to cost, \$~~

The proposed building PCI, without consideration of renewables, shall comply with the requirements of ANSI/ASHRAE/IES Standard 90.1, Section 4.2.1.1.

7.5.2 Annual Carbon Dioxide Equivalent (CO₂e). The proposed design shall have annual CO₂e emissions equal to or less than the annual CO₂e emissions of the *baseline building design* multiplied by the performance cost index target determined in accordance with 7.5.1. To determine the annual CO₂e for each energy source in the *baseline building design* and *proposed design*, the energy consumption shall be multiplied by the CO₂e emission factors from Table 7.5.2B.

Table 7.5.1 Energy Cost and CO₂e-Building Performance Factors (BPF) and Renewable Fractions (RF)

Building Type	Building Performance Factor (BPF)	Renewable Fraction (RF)
Multifamily	0.71	<u>0.50</u>
Healthcare/hospital	0.56	<u>0.35</u>
Hotel/motel	0.58	<u>0.50</u>
Office	0.54	<u>0.50</u>
Restaurant	0.59	<u>0.10</u>
Retail	0.50	<u>0.50</u>
School	0.37	<u>0.50</u>
Semiheated warehouse ^a	0.44	<u>0.50</u>
All Others	0.54	<u>0.50</u>

a. Conditioned warehouses shall use the “All others” category.

Table 7.5.2B CO₂e Emission Factors

Building Project Energy Source	CO ₂ e, lb/MWh	CO ₂ e, kg/MWh
Grid-delivered electricity and other fuels not specified in this table	1348	612
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Fuel oil (residual)	685	311
Fuel oil (distillate)	663	301
Coal	820	372
Gasoline	681	309
Natural gas	509	231
District chilled water	323	146
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District hot water	807	366

The values in this table represent national averages for the United States and include both direct and indirect emissions.

7.5.3 Zero Energy Performance Index. The zero energy performance index (zEPI₂₀₀₄) of the proposed design, including on-site renewable energy systems, shall be less than the target (zEPI_{2004,Target}). zEPI₂₀₀₄ and zEPI_{2004,Target} shall be calculated as described below.

$$zEPI_{2004} = \frac{\sum_i PDSE_i \times r_i - \sum_k RE_k \times REPF_k \times r_e}{\sum_i BBSE_i \times r_i}$$

$$zEPI_{2004} = \frac{\sum_i PDE_i \times r_i}{\sum_i BBE_i \times r_i}$$

where

zEPI₂₀₀₄ = Zero energy performance index relative to the Standard 90.1 baseline as defined in the performance rating method of Appendix G.

PDSE_i = Proposed design site energy use for energy type i.

BBSE_i = Baseline building site energy use for energy type i. The baseline building is created following the rules in Standard 90.1, Appendix G.

r_i = Source energy conversion factor for energy type i, value taken from Table 7.5.2-1 7.5.3.

RE_k = Annual renewable energy electricity production for renewable energy procurement method k (see Table 7.4.1.2)

$REPF_k$ = Renewable energy factor from Table 7.4.1.2 for renewable energy procurement method k

r_e = Source energy conversion factor taken from Table 7.5.3 for electricity.

Informative Note: *On-site thermal energy and renewable energy contributions to district energy plants are accounted for in the PDE_i term through reductions in electricity and/or gas use. The RE_k term will always be electricity.*

$$zEPI_{2004\ Target} = \frac{[BBUSE + (BBRSE \times BPF)] \times (1 - RF)}{BBUSE + BBRSE}$$

$$zEPI_{2004\ Target} = \frac{BBUSE + (BBRSE \times BPF) - RECSE}{BBUSE + BBRSE}$$

where

$zEPI_{2004\ Target}$ = Zero energy performance index target required for achieving compliance with the standard, unitless.

$BBUSE$ = Baseline building *unregulated energy use* expressed in source units.

$BBRSE$ = Baseline building *regulated energy use* expressed in source units.

BPF = Building performance factor taken from Table 7.5.1, unitless.

$RECSE$ = Renewable fraction from Table 7.5.1, unitless. energy production determined from section 7.4.1.1.1 and converted to source energy

Informative Note: *Informative Appendix I details a methodology for converting $zEPI_{2004}$ to $zEPI$. $zEPI_{2004}$ uses Standard 90.1 Appendix G to define the baseline building. The traditional definition of $zEPI$ uses the median energy of the existing building stock in the year 2000 as the baseline. The traditional $zEPI$ definition is used by the Architecture 2030 program and for other programs.*

TABLE 7.5.3 National Average Source Energy Conversion Factors

Energy Type	Conversion Factor (r)
Imported Electricity	3.15
Exported Renewable Electricity	3.15
Natural Gas	1.09
Fuel Oil (1,2,4,5,6,Diesel, Kerosene)	1.19
Propane & Liquid Propane	1.15
Steam	1.45
Hot Water	1.35
Chilled Water	1.04
Coal or Other	1.05

Informative Note: The values in this table represent national averages for the United States..

Addendum e to 189.1-2017

Note to reviewers: The first section of this addendum shows changes being made by this addendum relative to Section 7.5 from 189.1-2017 including modifications from Addendum ar, Addendum e and Addendum k, i.e., material from ar, e and k are shown as the base document. The changes open for public review are those in the first section.

The second section of the addendum showed Addendum k for informational purposes

This section of the addendum shows Addendum e for informational purposes. These changes are shown with Standard 189.1-2017 plus Addendum ar as the base document. The changes shown in this section are not open for public review.

7.5.2 Annual Carbon Dioxide Equivalent (CO₂e). The *proposed design* shall have annual CO₂e equal to or less than the annual CO₂e of the *baseline building design* multiplied by the performance cost index target determined in accordance with 7.5.1 ~~building performance factor (BPF) target determined from Table 7.5.2A using the performance rating method in ANSI/ASHRAE/IES Standard 90.1, Normative Appendix G.~~ To determine the annual CO₂e for each energy source in the *baseline building design* and *proposed design*, the energy consumption shall be multiplied by the CO₂e emission factors from Table 7.5.2B.

Addendum ar to 189.1-2014

Note to reviewers: The first section of this addendum shows changes being made by this addendum relative to Section 7.5 from 189.1-2017 including modifications from Addendum ar, Addendum e and Addendum k, i.e., material from ar, e and k are shown as the base document. The changes open for public review are those in the first section.

The second section of the addendum showed Addendum k for informational purposes and the third section showed Addendum e for informational purposes.

This section of the addendum shows Addendum ar for informational purposes. These changes are shown with Standard 189.1-2017 as the base document. Some editorial changes are included because Addendum ar originated as an addendum to 189.1-2014 and because of editorial errors in the original addendum. The changes shown in this section are not open for public review.

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.

$$zEPI_{2004} = \frac{\sum_i PDE_i \times r_i}{\sum_i BBE_i \times r_i}$$

where

$zEPI_{2004}$ = Zero energy performance index relative to the Standard 90.1 baseline as defined in the performance rating method of Appendix G.

PDE_i = Proposed design site energy use for energy type i.

BBE_i = Baseline building site energy use for energy type i. The baseline building is created following the rules in Standard 90.1, Appendix G.

r_i = Source energy conversion factor for energy type i, value taken from Table 7.5.3.

$$zEPI_{2004,Target} = \frac{BBUSE + (BBRSE \times BPF) - RECSE}{BBUSE + BBRSE}$$

where

$zEPI_{2004,Target}$ = Zero energy performance index target required for achieving compliance with the standard, unitless.

$BBUSE$ = Baseline building *unregulated energy use* expressed in source units.

$BBRSE$ = Baseline building *regulated energy use* expressed in source units.

BPF = Building performance factor taken from Table 7.5.1, unitless.

$RECSE$ = Renewable energy production determined from section 7.4.1.1.1 and converted to source energy

Informative Note: *Informative Appendix I details a methodology for converting $zEPI_{2004}$ to $zEPI$. $zEPI_{2004}$ uses Standard 90.1 Appendix G to define the baseline building. The traditional definition of $zEPI$ uses the median energy of the existing building stock in the year 2000 as the baseline. The traditional $zEPI$ definition is used by the Architecture 2030 program and for other programs.*

TABLE 7.5.3 National Average Source Energy Conversion Factors

<u>Energy Type</u>	<u>Conversion Factor (r)</u>
<u>Imported Electricity</u>	<u>3.15</u>
<u>Exported Renewable Electricity</u>	<u>3.15</u>
<u>Natural Gas</u>	<u>1.09</u>
<u>Fuel Oil (1,2,4,5,6,Diesel, Kerosene)</u>	<u>1.19</u>
<u>Propane & Liquid Propane</u>	<u>1.15</u>
<u>Steam</u>	<u>1.45</u>
<u>Hot Water</u>	<u>1.35</u>
<u>Chilled Water</u>	<u>1.04</u>
<u>Coal or Other</u>	<u>1.05</u>

Informative Note: The values in this table represent national averages for the United States..

Anticipated Section 7.5

Note to reviewers: Section 7.5 is being modified by Addendum ar, Addendum e, Addendum k, Addendum z and Addendum aa. If all five of these addenda are approved for publication, the resulting Section 7.5 is shown below.

7.5 Performance Option

7.5.1 Annual Energy Cost. The *proposed building performance* cost index with consideration of renewables shall be calculated in accordance with ANSI/ASHRAE/IES Standard 90.1, Normative Appendix G, and be equal to or less than the Performance Cost Index (PCI) Target, as determined from the following equation:

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where

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BBUEC = the component of *baseline building performance* that is due to *unregulated energy use*, \$

BBREC = the component of *baseline building performance* that is due to *regulated energy use*, or *baseline building performance* minus BBUEC, \$

BPF = building performance factor taken from Table 7.5.1, unitless.

RF = renewable energy production fraction from Table 7.5.1.

The proposed building PCI, without consideration of renewables, shall comply with the requirements of ANSI/ASHRAE/IES Standard 90.1, Section 4.2.1.1.

Table 7.5.1 E nergy Cost and CO₂e Building Performance Factors (BPF)

Building Type	Building Performance Factor (BPF)	Renewable Fraction (RF)
Multifamily	0.71	0.50
Healthcare/hospital	0.56	0.35
Hotel/motel	0.58	0.50
Office	0.54	0.50
Restaurant	0.59	0.10
Retail	0.50	0.50
School	0.37	0.50
Semiheated warehouse ^a	0.44	0.50
All Others	0.54	0.50

a. Conditioned warehouses shall use the "All others" category.

7.5.2 Annual Carbon Dioxide Equivalent (CO₂e). The *proposed design* shall have annual CO₂e emissions equal to or less than the annual CO₂e emissions of the *baseline building design* multiplied by the performance cost index target determined in accordance with 7.5.1. To determine the annual CO₂e for each energy source in the *baseline building design* and *proposed design*, the energy consumption shall be multiplied by the CO₂e emission factors from Table 7.5.2B. eGRID values shall be used for electricity when applicable.

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$$zEPI_{2004} = \frac{\sum_i PDSE_i \times r_i - \sum_k RE_k \times REPF_k \times r_e}{\sum_i BBSE_i \times r_i}$$

where

$zEPI_{2004}$ = Zero energy performance index relative to the Standard 90.1 baseline as defined in the performance rating method of Appendix G.

$PDSE_i$ = Proposed design site energy use for energy type i.

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r_i = Source energy conversion factor for energy type i, taken from Table 7.5.3.

RE_k = Annual renewable energy electricity production for renewable energy procurement method k (see Table 7.4.1.2)

$REPF_k$ = Renewable energy factor from Table 7.4.1.2 for renewable energy procurement method k

r_e = Source energy conversion factor taken from Table 7.5.3 for electricity.

Informative Note: *On-site thermal energy and renewable energy contributions to district energy plants are accounted for in the PDE_i term through reductions in electricity and/or gas use. The RE_k term will always be electricity.*

$$zEPI_{2004 \text{ Target}} = \frac{[BBUSE + (BBRSE \times BPF)] \times (1 - RF)}{BBUSE + BBRSE}$$

where

$zEPI_{2004 \text{ Target}}$ = Zero energy performance index target required for achieving compliance with the standard, unitless.

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$BBRSE$ = Baseline building *regulated energy use* expressed in source units.

BPF = Building performance factor taken from Table 7.5.1, unitless.

RF = Renewable fraction from Table 7.5.1, unitless.

TABLE 7.5.3 Source Energy Conversion and CO₂e Emissions Factors

Energy Form	Source Energy Conversion Factor	CO ₂ e Emission Factor	
		lb/MWh	kg/MWh
Fossil Fuels Used Directly in Building			
Natural gas	1.09	681	309
LPG or propane	1.15	651	295
Fuel oil (residual)	1.19	738	335
Fuel oil (distillate)	1.19	715	324
Coal	1.05	892	405
Gasoline	1.19	744	337
Electricity			
AKGD - ASCC Alaska Grid	2.52	1,580	717
AKMS - ASCC Miscellaneous	1.21	738	335
AZNM - WECC Southwest	2.75	1,496	679
CAMX - WECC California	1.94	957	434
ERCT - ERCOT All	2.58	1,529	694
FRCC - FRCC All	2.97	1,601	726
HIMS - HICC Miscellaneous	2.86	1,717	779
HIOA - HICC Oahu	3.83	2,460	1,116
MROE - MRO East	3.08	2,337	1,060
MROW - MRO West	2.50	1,686	765
NEWE - NPCC New England	2.87	1,024	464
NWPP - WECC Northwest	1.39	936	425
NYCW - NPCC NYC/Westchester	2.92	1,034	469
NYLI - NPCC Long Island	2.90	1,600	726
NYUP - NPCC Upstate NY	1.97	540	245
RFCE - RFC East	3.05	1,156	524
RFCM - RFC Michigan	3.06	1,806	819
RFCW - RFC West	3.14	1,757	797
RMPA - WECC Rockies	2.33	1,829	830
SPNO - SPP North	2.67	1,851	840
SPSO - SPP South	2.46	1,737	788
SRMV - SERC Mississippi Valley	2.95	1,421	645
SRMW - SERC Midwest	3.20	2,234	1,014
SRSO - SERC South	3.04	1,651	749
SRTV - SERC Tennessee Valley	3.02	1,677	761
SRVC - SERC Virginia/Carolina	3.11	1,255	569
All other electricity and other fuels not specified in this table	2.64	1,418	643
District Thermal Energy			
Chilled water	0.63	339	154
Steam	1.83	1,145	519
Hot water	1.73	1,081	491

Informative Note: Values in this table represent averages for the United States and include both direct and indirect emissions.

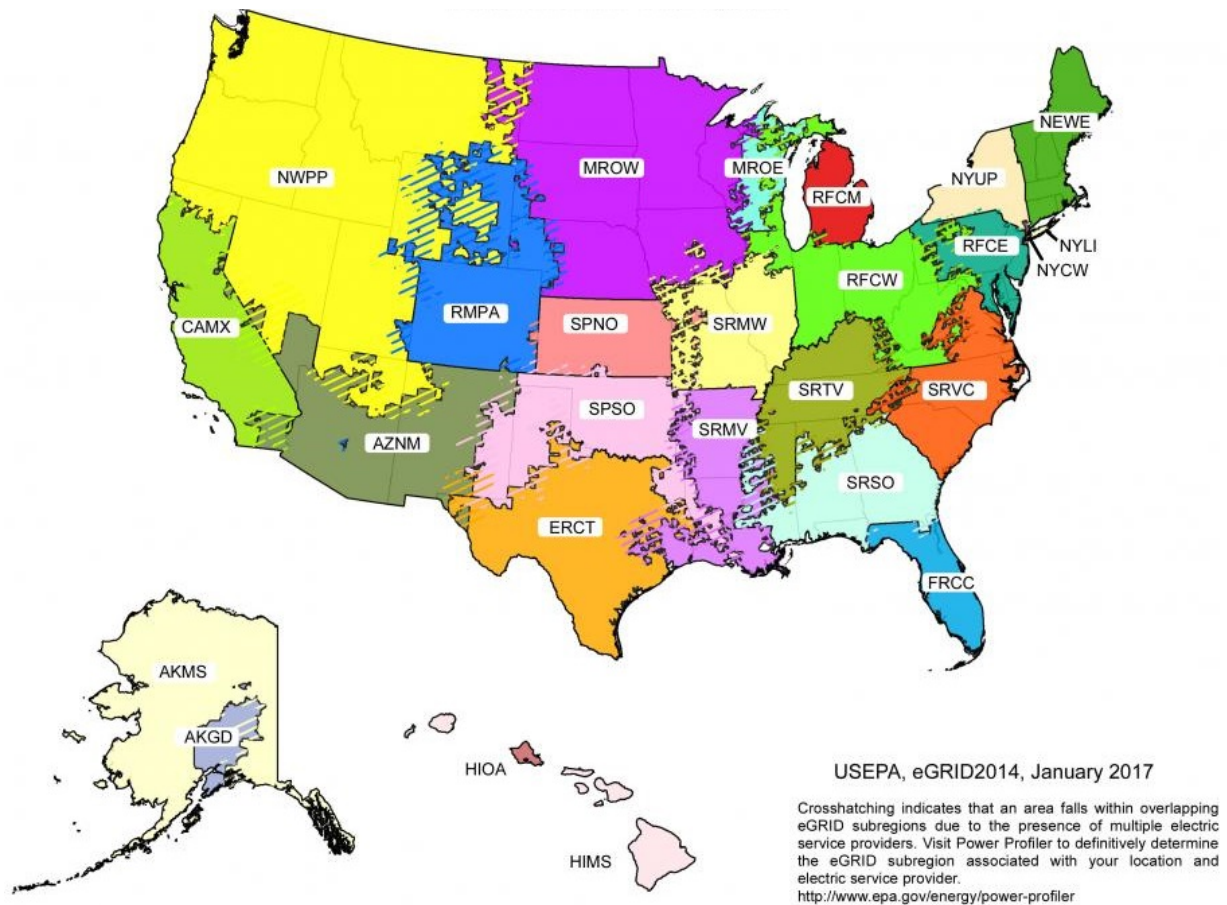


Figure 7.5.3 Map of eGRID Subregions

Crosshatching indicates that an area falls within overlapping eGRID subregions due to the presence of multiple electric service providers. Visit Power Profiler to definitively determine the eGRID subregion associated with your location and electric service provider. See <http://www.epa.gov/energy/power-profiler>.