

**ANSI/ASHRAE/ICC/USGBC/IES Addendum r to
ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2023**

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 ASHRAE and the American National Standards Institute on September 30, 2026; by the International Code Council on September 28, 2026; by the U.S. Green Building Council on September 25, 2026; and by the Illuminating Engineering Society on September 23, 2026.

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FOREWORD

Addendum r updates the annual average carbon emission rates in Table 7.6.2.1 of Addendum h to Standard 189.1-2023.¹ The update is based on data available from U.S. DOE, U.S. EPA, DOE/NETL, and NREL at the time of publication. Documentation of these data sources and the methodology used is provided in an update to Informative Appendix I, which is issued concurrently with this addendum as Addendum s.

Informative 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.

Addendum r to Standard 189.1-2023

Modify Section 7.6.2.1 and Table 7.6.2.1 as follows.

7.6.2.1 Annual Average GHG Emissions. To determine the annual CO_2e for each energy source in the baseline building and proposed design (GHG_{UBB} , GHG_{RBB} , $GHG_{proposed}$), the energy consumption for each fuel shall be multiplied by the CO_2e emission factors from Table 7.6.2.1. U.S. locations shall use values for eGRID subregions from Table 7.6.2.1 and Figure 7.6.2.1(a) for electricity and Figure 7.6.2.1(b) for natural gas. Locations outside the U.S. shall use the value for “All other electricity” and “Other” for natural gas or locally derived values.

(Informative Note: The values in Table 7.6.2.1 are based on eGRID subregions and delivery of electricity and fossil fuels for U.S. locations. ~~Some jurisdictions~~ Jurisdictions may use locally derived values based on procedures in Informative Appendix I.)

Table 7.6.2.1 CO_2e Emissions Factors

	CO_2e Emissions (kg/MWh)		
	Combustion	Precombustion	Total
<u>Electricity</u>¹			
<u>AKGD—ASCC Alaska Grid</u>	<u>521</u>	<u>122</u>	<u>643</u>
<u>AKMS—ASCC Miscellaneous</u>	<u>263</u>	<u>80</u>	<u>343</u>
<u>AZNM—WECC Southwest</u>	<u>358</u>	<u>92</u>	<u>450</u>
<u>CAMX—WECC California</u>	<u>235</u>	<u>74</u>	<u>309</u>
<u>ERCT—ERCOT All</u>	<u>481</u>	<u>123</u>	<u>605</u>
<u>FRCC—FRCC All</u>	<u>407</u>	<u>129</u>	<u>536</u>
<u>HIMS—HICC Miscellaneous</u>	<u>668</u>	<u>204</u>	<u>872</u>
<u>HIOA—HICC Oahu</u>	<u>815</u>	<u>251</u>	<u>1067</u>
<u>MROE—MRO East</u>	<u>659</u>	<u>128</u>	<u>787</u>
<u>MROW—MRO West</u>	<u>506</u>	<u>87</u>	<u>592</u>
<u>NEWE—NPCC New England</u>	<u>309</u>	<u>65</u>	<u>373</u>
<u>NWPP—WECC Northwest</u>	<u>320</u>	<u>72</u>	<u>392</u>
<u>NYCW—NPCC NYC/Westchester</u>	<u>444</u>	<u>95</u>	<u>539</u>
<u>NYLI—NPCC Long Island</u>	<u>453</u>	<u>97</u>	<u>549</u>
<u>NYUP—NPCC Upstate NY</u>	<u>126</u>	<u>27</u>	<u>153</u>

1. https://www.ashrae.org/file%20library/technical%20resources/standards%20and%20guidelines/standards%20addenda/189_1_2023_h_20250530.pdf

Table 7.6.2.1 CO₂e Emissions Factors (Continued)

		CO ₂ e Emissions (kg/MWh)		
		Combustion	Precombustion	Total
<u>PRMS—Puerto Rico Miscellaneous</u>		<u>722</u>	<u>188</u>	<u>911</u>
<u>RFCE—RFC East</u>		<u>305</u>	<u>62</u>	<u>367</u>
<u>RFCM—RFC Michigan</u>		<u>549</u>	<u>118</u>	<u>667</u>
<u>RFCW—RFC West</u>		<u>472</u>	<u>97</u>	<u>569</u>
<u>RMPA—WECC Rockies</u>		<u>517</u>	<u>98</u>	<u>615</u>
<u>SPNO—SPP North</u>		<u>577</u>	<u>100</u>	<u>678</u>
<u>SPSO—SPP South</u>		<u>485</u>	<u>117</u>	<u>602</u>
<u>SRMV—SERC Mississippi Valley</u>		<u>403</u>	<u>120</u>	<u>523</u>
<u>SRMW—SERC Midwest</u>		<u>649</u>	<u>110</u>	<u>759</u>
<u>SRSO—SERC South</u>		<u>449</u>	<u>118</u>	<u>567</u>
<u>SRTV—SERC Tennessee Valley</u>		<u>455</u>	<u>95</u>	<u>550</u>
<u>SRVC—SERC Virginia/Carolina</u>		<u>319</u>	<u>84</u>	<u>403</u>
<u>All other electricity²</u>		<u>371</u>	<u>78</u>	<u>448</u>
<u>Fossil Fuels Delivered to Buildings</u>				
<u>Natural gas</u>	<u>Midwest</u>	<u>184</u>	<u>59</u>	<u>243</u>
	<u>Northeast</u>	<u>184</u>	<u>44</u>	<u>228</u>
	<u>Pacific</u>	<u>184</u>	<u>69</u>	<u>253</u>
	<u>Rocky Mtn.</u>	<u>184</u>	<u>68</u>	<u>252</u>
	<u>Southeast</u>	<u>184</u>	<u>70</u>	<u>254</u>
	<u>Southwest</u>	<u>184</u>	<u>65</u>	<u>249</u>
	<u>Other²</u>	<u>184</u>	<u>52</u>	<u>236</u>
<u>LPG or propane</u>		<u>229</u>	<u>66</u>	<u>295</u>
<u>Fuel oil (residual)</u>		<u>265</u>	<u>70</u>	<u>334</u>
<u>Fuel oil (distillate)</u>		<u>255</u>	<u>69</u>	<u>324</u>
<u>Coal</u>		<u>332</u>	<u>51</u>	<u>382</u>
<u>Gasoline</u>		<u>255</u>	<u>82</u>	<u>337</u>
<u>Other fuels not specified in this table</u>		<u>332</u>	<u>51</u>	<u>382</u>
<u>Thermal Energy</u>				
<u>Chilled water</u>		<u>89</u>	<u>19</u>	<u>107</u>
<u>Steam</u>		<u>309</u>	<u>88</u>	<u>397</u>
<u>Hot water</u>		<u>292</u>	<u>83</u>	<u>375</u>

Informative Notes:

1. The electricity emissions rates are based on the residual generation mix.

2. This is the U.S. average.

3. The CO₂e emission factors presented in this table are based on U.S. data and a 20-year time-horizon for methane (CH₄) and nitrous oxide (N₂O). When comparing or combining CO₂e values, care should be taken to ensure that a consistent time-horizon is used for all estimates of CO₂e. Informative Appendix I, Table I-10-Table I-11 in Informative Appendix I has emission rates based on a 100-year time-horizon for use when the use of 100-year time horizons is necessary.

Table 7.6.2.1 CO₂e Emissions Factors

	CO ₂ e Emissions kg/MWh		
	Combustion	Precombustion	Total
Fossil fuels delivered to buildings			
Natural gas	184	93	277
Liquefied petroleum gas or propane	229	66	295
Fuel oil (residual)	265	70	334
Fuel oil (distillate)	255	69	324
Coal	332	51	382
Gasoline	255	82	337
Other fuels not specified in this table	332	51	382
Electricity			
AKGD—ASCC Alaska Grid	514	159	673
AKMS—ASCC miscellaneous	289	93	383
AZNM—WECC Southwest	444	121	565
CAMX—WECC California	255	88	343
ERCT—ERCOT all	431	126	558
FRCC—FRCC all	442	155	596
HIMS—HICC miscellaneous	681	211	892
HIOA—HICC Oahu	895	233	1128
MROE—MRO East	770	150	920
MROW—MRO West	534	94	628
NEWE—NPCC New England	287	96	383
NWPP—WECC Northwest	349	76	426
NYCW—NPCC NYC/Westchester	269	110	379
NYLI—NPCC Long Island	481	169	650
NYUP—NPCC Upstate NY	132	48	180
PRMS—Puerto Rico Miscellaneous	731	214	944
RFCE—RFC East	350	106	456
RFCM—RFC Michigan	594	133	727
RFCW—RFC West	532	113	645
RMPA—WECC Rockies	580	120	699
SPNO—SPP North	515	93	608
SPSO—SPP South	460	123	583
SRMV—SERC Mississippi Valley	418	137	555
SRMW—SERC Midwest	779	134	913
SRSO—SERC South	496	133	629
SRTV—SERC Tennessee Valley	473	104	577
SRVC—SERC Virginia/Carolina	360	97	456
All other electricity	436	111	547
Thermal Energy			
Chilled water	104	26	131
Steam	309	157	466
Hot water	292	148	440

Modify Figure 7.6.2.1 as follows. Insert new Figure 7.6.2.1(b).

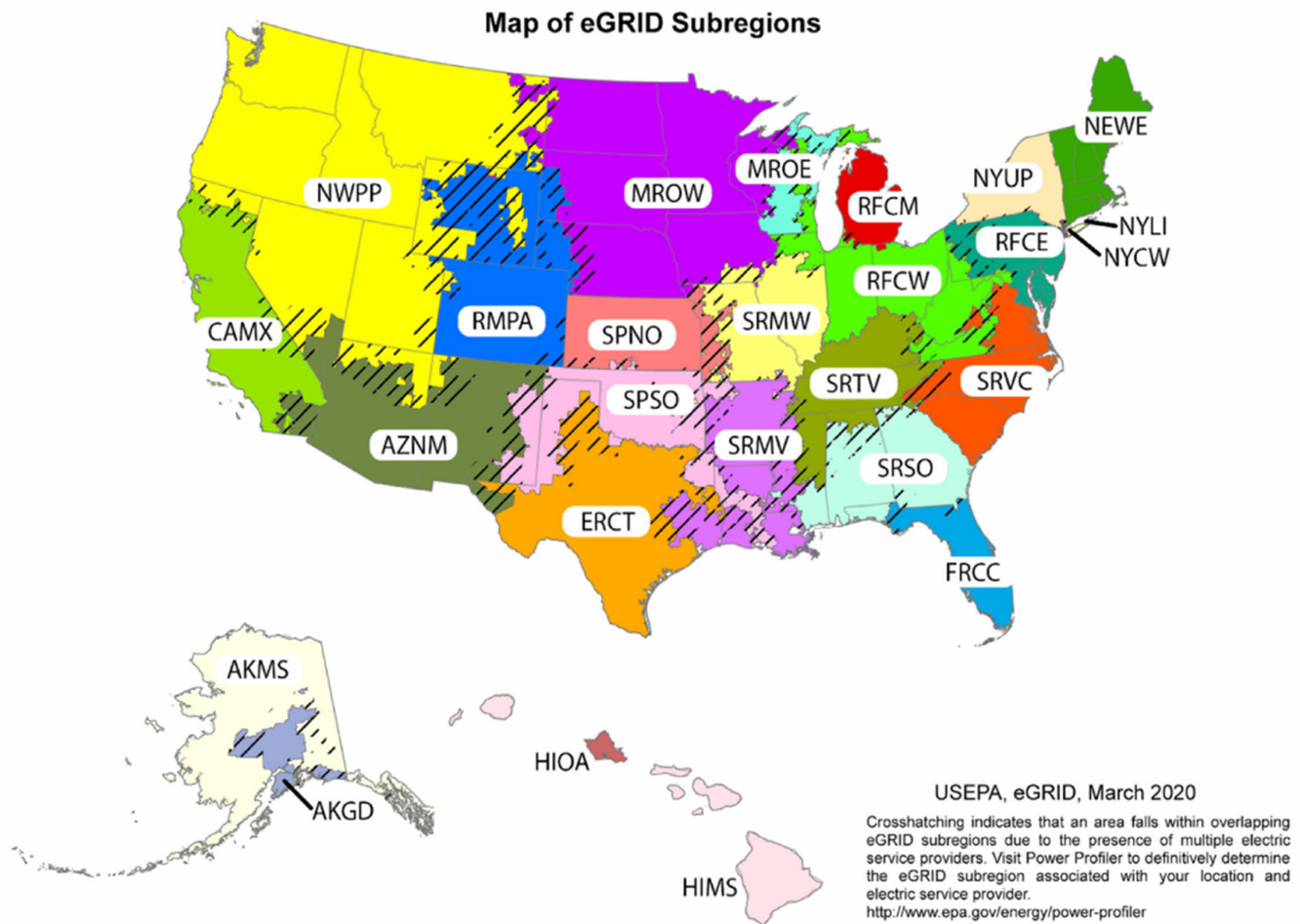


Figure 7.6.2.1(a) Figure 7.6.2.4 Map of eGRID subregions.

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 <https://www.epa.gov/egrid/power-profiler>).

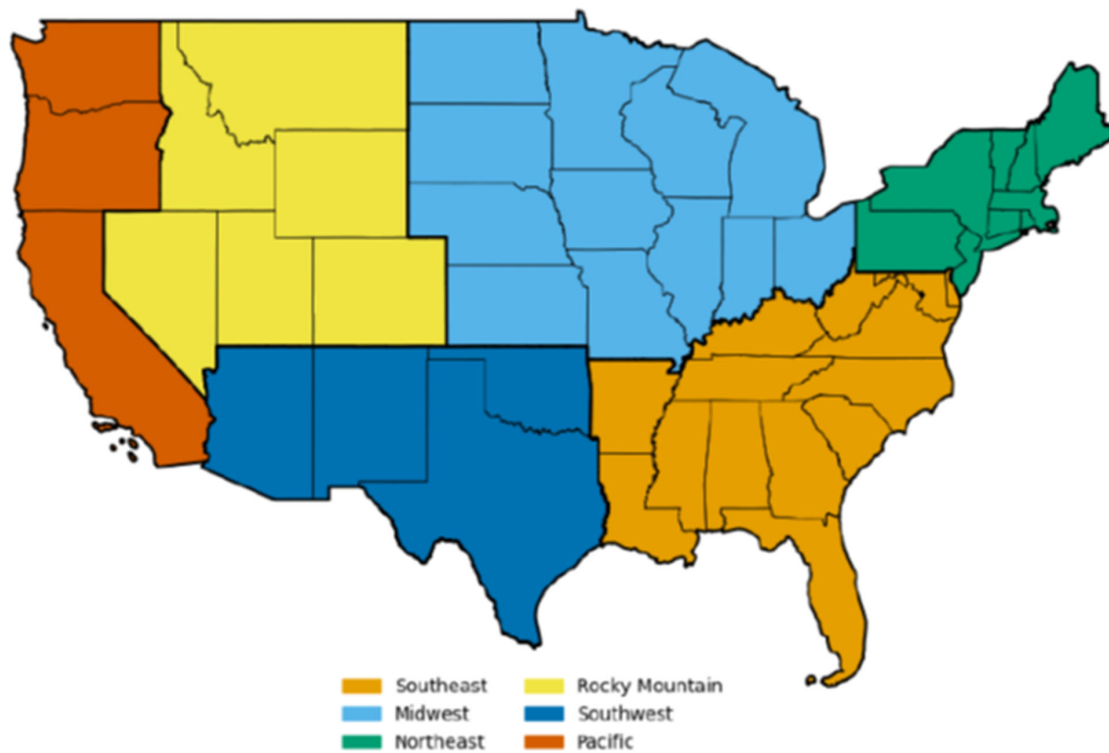


Figure 7.6.2.1(b) Map of six regions for natural gas delivery.

Exhibit 4.12 in Life Cycle Analysis of Natural Gas Extraction and Power Generation: U.S. 2020 Emissions Profile, DOE/NETL-2024/4862, December 2024.

**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.

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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