

GEW31-14

602.1.2.1, Table 602.1.2.1, 602.1.2.2, Table 602.1.2.2, 602.2.1, Table 602.2.1, 602.2.2, Table 602.2.2

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Revise as follows:

602.1.2.1 Modifications to Appendix G of ASHRAE 90.1. The performance rating in Section G1.2 of ASHRAE 90.1 shall be based on energy use converted to consistent units in accordance with Sections 602.1.2.2 and 602.1.2.3, instead of energy cost.

**TABLE 602.1.2.1
ELECTRICITY GENERATION ENERGY CONVERSION FACTORS BY EPA eGRID SUB-REGION^a**

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
AKGD	ASCC Alaska Grid	2.97 <u>3.15</u>
AKMS	ASCC Miscellaneous	1.76 <u>1.90</u>
ERCT	ERCOT All	2.93 <u>3.08</u>
FRCC	FRCC All	2.97 <u>3.26</u>
HIMS	HICC Miscellaneous	3.82 <u>3.67</u>
HIOA	HICC Oahu	3.14
MORE	MRO East	3.40 <u>3.50</u>
MROW	MRO West	3.41 <u>3.64</u>
NYLI	NPCC Long Island	3.20 <u>3.47</u>
NEWE	NPCC New England	3.04 <u>3.03</u>
NYCW	NPCC NYC/Westchester	3.32 <u>3.21</u>
NYUP	NPCC Upstate NY	2.54 <u>2.66</u>
RFCE	RFC East	3.15 <u>3.28</u>
RFCM	RFC Michigan	3.05 <u>3.35</u>
RFCW	RFC West	3.14 <u>3.29</u>
SRMW	SERC Midwest	3.24 <u>3.40</u>
SRMV	SERC Mississippi Valley	3.00 <u>3.20</u>
SRSO	SERC South	3.08 <u>3.20</u>
SRTV	SERC Tennessee Valley	3.14 <u>3.30</u>
SRVC	SERC Virginia/Carolina	3.13 <u>3.24</u>
SPNO	SPP North	3.53 <u>3.57</u>
SPSO	SPP South	3.05 <u>3.26</u>

NOTE: This version of the code change proposal has been updated to include all reported errata.

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	ENERGY CONVERSION FACTOR
CAMX	WECC California	2.64 <u>2.89</u>
NWPP	WECC Northwest	2.26 <u>2.32</u>
RMPA	WECC Rockies	3.18 <u>3.82</u>
AZNM	WECC Southwest	2.95 <u>3.10</u>
None	Not Included	3.15

a. Sources: EPA eGrid 2007 version 1.1, 2005 data; EPA eGrid regional gross grid loss factors; EIA Table 8.4a (Sum tables 8.4b and 8.4c) and Table 8.2c (Breakout of Table 8.2b), 2005 data.

602.1.2.2 Electric power. In calculating the annual energy use index, electric energy used shall be consistent units by converting the electric power use at the utility meter or measured point of delivery to Btus and multiplying by the conversion factor in Table 602.1.2.1 based on the geographical location of the building.

**TABLE 602.1.2.2
U.S. AVERAGE BUILDING FUELS ENERGY CONVERSION FACTORS BY FUEL TYPE ^a**

FUEL TYPE	ENERGY CONVERSION FACTOR
Natural Gas	1.09
Fuel Oil	4.43 <u>1.19</u>
LPG	4.42 <u>1.15</u>

a. Source: Gas Technology Institute Source Energy and Emissions Analysis Tool.

602.2.1 Onsite electricity. Emissions associated with use of electric power shall be based on electric power excluding any renewable or recovered waste energy covered under Section 602.2.1. Emissions shall be calculated by converting the electric power used by the building at the electric utility meter or measured point of delivery, to kWh ~~MWh~~s, and multiplying by the CO₂e conversion factor in Table 602.2.1 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.1
ELECTRICITY EMISSION RATE BY EPA eGRID SUB-REGION ^a**

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh) (<u>kg/kWh</u>)
AKGD	ASCC Alaska Grid	4270 <u>0.685</u>
AKMS	ASCC Miscellaneous	545 <u>0.265</u>
ERCT	ERCOT All	4417 <u>0.698</u>
FRCC	FRCC All	4416 <u>0.617</u>
HIMS	HICC Miscellaneous	4595 <u>0.722</u>
HIOA	HICC Oahu	48594 <u>0.825</u>
MORE	MRO East	4974 <u>0.909</u>
MROW	MRO West	4957 <u>0.964</u>
NYLI	NPCC Long Island	4654 <u>0.698</u>
NEWE	NPCC New England	999 <u>0.428</u>

NOTE: This version of the code change proposal has been updated to include all reported errata.

eGRID 2007 2010 SUB-REGION ACRONYM	eGRID 2007 2010 SUB-REGION NAME	2005 CO ₂ e RATE (lbs/MWh) (kg/kWh)
NYCW	NPCC NYC/Westchester	874 <u>0.391</u>
NYUP	NPCC Upstate NY	774 <u>0.369</u>
RFCE	RFC East	1224 <u>0.543</u>
RFCM	RFC Michigan	1680 <u>0.874</u>
RFCW	RFC West	1652 <u>0.820</u>
SRMW	SERC Midwest	1966 <u>0.960</u>
SRMV	SERC Mississippi Valley	1094 <u>0.572</u>
SRSO	SERC South	1601 <u>0.780</u>
SRTV	SERC Tennessee Valley	1623 <u>0.818</u>
SRVC	SERC Virginia/Carolina	1220 <u>0.581</u>
SPNO	SPP North	2106 <u>0.972</u>
SPSO	SPP South	1780 <u>0.873</u>
CAMX	WECC California	768 <u>0.370</u>
NWPP	WECC Northwest	958 <u>0.453</u>
RMPA	WECC Rockies	1999 <u>1.149</u>
AZNM	WECC Southwest	1391 <u>0.671</u>
<u>None</u>	<u>Not Included</u>	<u>0.692</u>

a. Sources: EPA eGRID 2007 Version 1.1, 2005 data; EPA eGrid regional gross grid-loss factor.

602.2.2 Onsite nonrenewable energy. Emissions associated with the use of nonrenewable energy sources other than electrical power such as natural gas, fuel oil, and propane shall be calculated by multiplying the fossil fuel energy used by the building and its site at the utility meter by the national emission factors in Table 602.2.2 and the conversions required by this section. Emissions associated with fossil fuels not specified in Table 602.2.2 shall be calculated by multiplying the fossil fuel used by the building at the utility meter by ~~250~~ 217. Emissions associated with purchased district energy shall be calculated by multiplying the energy used by the building at the utility meter by ~~450~~ 191 for hot water, 205 for ~~and~~ steam, and 147 for district cooling, the factors from Table 602.2.2 based on the EPA eGRID Sub-region in which the building is located.

**TABLE 602.2.2
FOSSIL FUEL EMISSION FACTORS**

EMISSION RATE (lb/MMBtu HHV)	NATURAL GAS AS STATIONARY FUEL	FUEL OIL AS STATIONARY FUEL	PROPANE AS STATIONARY FUEL
CO ₂ e	437.35 <u>141</u>	200.63 <u>198</u>	162.85 <u>172</u>

For SI: MMBtu = 1,000,000 Btu = 10 terms therms; HHV = High Higher-heating value.

Reason: This proposal updates factors for all energy forms based on the methodology and values contained in the revised version of ASHRAE Standard 105, Standard Methods of Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions, Tables J2-A through J2-D.

The proposal also adds a row of electricity conversion factors for those interested in using the code (such as Canada or Mexico) whose buildings are not located in any of the eGRID sub-regions.

The footnoted sources of the data in the tables should not be in the body of the code, but can be in the users manual.

NOTE: This version of the code change proposal has been updated to include all reported errata.

The proposal also fixes typos in the footnote to Table 602.2.2.

Bibliography:

ASHRAE Standard 105, Standard Methods of Determining, Expressing and Comparing Building Energy Performance and Greenhouse Gas Emissions (publication expected in 2014).

Cost Impact: Will not increase the cost of construction.

GEW31-14: TABLE602.1.2.1-LESLIE1037
