

Green-e Energy Residual Mix Emissions Rates (2018)

The information in these tables can be used by electricity users in the U.S. and Canada for calculating the Scope 2 greenhouse gas (GHG) emissions associated with unspecified sources of electricity (i.e. any portion of electricity use for which specified sources of electricity have not been purchased). Green-e Energy certified products are considered specified sources. These tables provide a “residual mix” emissions rate that has been adjusted to remove all Green-e Energy certified sales for each NERC region¹. When calculating Scope 2 GHG emissions for unspecified electricity use, where more accurate information about the resources and emissions associated with electricity use is not available from the user’s state, region, electricity supplier, or a tracking system, these residual mix rates can be used. Green-e Energy residual mix emissions rates are published annually in the Spring using verified Green-e Energy sales data from two calendar years prior, and the most recent Canadian and U.S. generation and emissions rate at the time of publication. Users of Green-e Energy residual mix emissions rates are not expected to update their GHG accounting each time the rates are published, but should instead cite the residual mix rates used in their accounting.

Use of these numbers is compatible with the World Resource Institute’s Greenhouse Gas Protocol Scope 2 Guidance², which defines “residual mix” in more detail. Green-e Energy also offers a summary of the WRI Guidance showing users of Green-e Energy certified renewables how to calculate Scope 2 emissions³.

The residual mix emissions rate used should be based on the NERC region in which the electricity is consumed.

2018 Green-e Residual Mix Emission Rates for U.S. Customers (lb CO₂/MWh)

NERC Region	Adjusted Emissions Rate
ASCC	947.01
FRCC	1,017.28
HICC ⁴	1,522.10
MRO	1,258.19
NPCC	506.06
RFC	1,104.76
SERC	1,037.20
SPP	1,372.37
TRE	1,071.13
WECC	804.68

2018 Green-e Residual Mix Emission Rates for Canadian Customers (lb CO₂/MWh)

NERC Region	Adjusted Emissions Rate
MRO	528.99
NPCC	99.35
WECC	841.71

Residual Mix Rate Calculation Methodology

The 2018 Green-e Energy residual mix emissions rates were calculated using the data collected by Green-e Energy during annual verification of 2016 certified sales and the most recent emissions and generation data

¹ Since there are regional differences in generation and construction patterns in the U.S. electricity sector, regional boundaries provide a more accurate representation of the effects of renewable energy on the grid. While NERC regions do not necessarily represent the exact boundaries of power flows and vary dramatically in size, they are preferable to smaller regions (such as eGRID subregions) since the publicly available data generally does not account for the substantial impact of power imports and exports. A map of NERC regions is available from the [NERC Website](#).

² Available at <http://www.wri.org/publication/ghg-protocol-scope-2-guidance>.

³ The Green-e Energy Summary of WRI Scope 2 Guidance is available at <https://www.green-e.org/docs/energy/Scope2Summary.pdf>

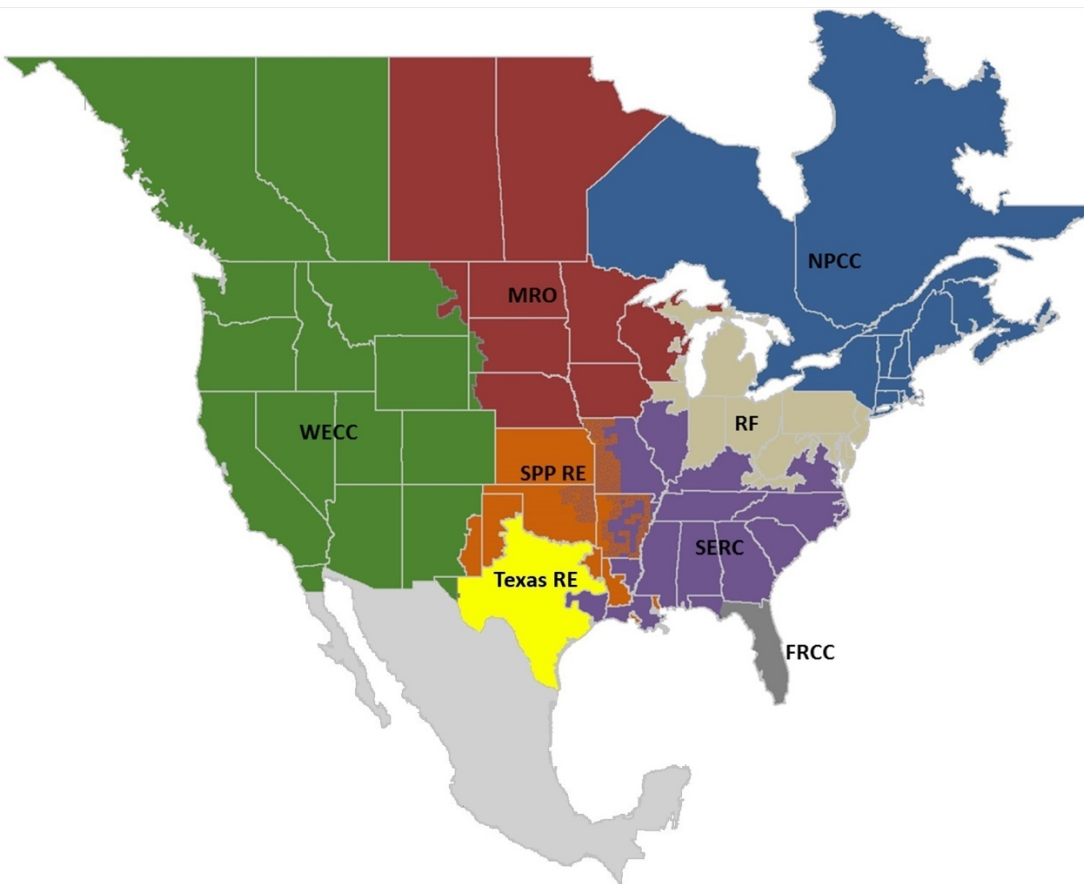
⁴ HICC emissions rate is unadjusted from eGrid because Hawaiian generation is not eligible for Green-e Energy.

provided by eGRID⁵ in the US for each NERC region⁶ and provincial emissions data in Canada provided by Natural Resources Canada.⁷

The residual mix emissions rate is calculated by first subtracting all unique Green-e Energy certified sales⁸ (in megawatt-hours [MWh]) from the total generation within each region. The total CO₂ emissions for each region is then divided by this new generation number for each region, resulting in an emissions rate (lb CO₂/MWh) that does not include generation from renewable energy used in a Green-e Energy certified sale.

For this calculation, each U.S.-generated MWh is assigned to a specific NERC region based on the location of the generator. If there is no publicly available source of information identifying the NERC region of a generator (e.g. tracking system or Energy Information Agency data), and the state of the generator is covered by more than one NERC region, the generator's output is assigned the NERC region that covers the majority of the state.

NERC Regions Map (Updated April 27, 2018)



⁵ U.S. EPA's Emissions & Generation Resource Integrated Database (eGRID). eGRID2016 (released 2/15/2018) contains the complete release of year 2016 data, <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-eGRID>.

⁶ NERC region map: <http://www.nerc.com/AboutNERC/keyplayers/Pages/default.aspx>

⁷ Energy and Economic Analysis Division, Energy Policy Branch, Natural Resources Canada (2014 data, retrieved 4/05/2017).

⁸ Unique Green-e Energy certified sales remove any MWh associated with a Green-e Energy certified retail sale for which the supply was purchased via a Green-e Energy certified wholesale transaction, since these two sales represent the same MWh of generation.