Total, Non-baseload, eGRID Subregion, State? Guidance on the Use of eGRID Output Emission Rates

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Summary Recommendations

- **To determine GHG emissions from electricity purchases in GHG inventories or carbon footprint calculations**

  -- use eGRID subregion total output emission rates

- **For rough estimates of emission reductions from energy efficiency and/or renewable energy usage**

  -- use eGRID subregion non-baseload output emission rates

- **Which year to use for carbon footprints and inventories?**
  - **For tracking emissions – use the latest available emission rates**

    except when estimating a historical year; then use appropriate previous year's emission rates
  - **For verification of emission goals – use the latest available emission rates**

    except if the rate has increased and that is the only thing preventing the achievement of the goal; then use the baseline emission rates.

What is eGRID?

- **A comprehensive source of data on the environmental characteristics of U.S. power generation at various level of aggregation**

  www.epa.gov/egrid

  - **Links electricity generation, air emissions and resource mix for virtually all U.S. power plants**
    - Data years: 2005, 2004, & 1996-2000
    - Emissions: CO_2, NO_X, SO_2, Hg,
      - CH_4 and N_2O (new for year 2005 data)
    - Fuel use, and net generation
    - Emissions rates data
      - input (lb/MMBtu)
      - output (lb/MWh)
    - State & U.S. import-export data (including gross grid loss factors)

Formats of data

- **Data contained in Microsoft Excel workbooks**
- **Summary data & GHG emission rates data in Adobe PDF documents.**
- **Technical Support Document contains full documentation**
- **Coming soon: eGRIDweb!**

Levels of Data

- **Basic Data**
  - **Boiler level**
  - **Generator level**
  - **Plant level**
    - Emissions, emission rates, generation, locational data, and other characteristics
    - Starting point for aggregated data

- **Aggregation Levels**
  - **State**
  - **Electric Generating Company (EGC)**
    - Operator-based
    - Owner-based
  - **Parent Company**
    - Operator-based
    - Owner-based
  - **Power Control Area (PCA)**
  - **eGRID Subregion**
  - **NERC Region**
  - **U.S.**

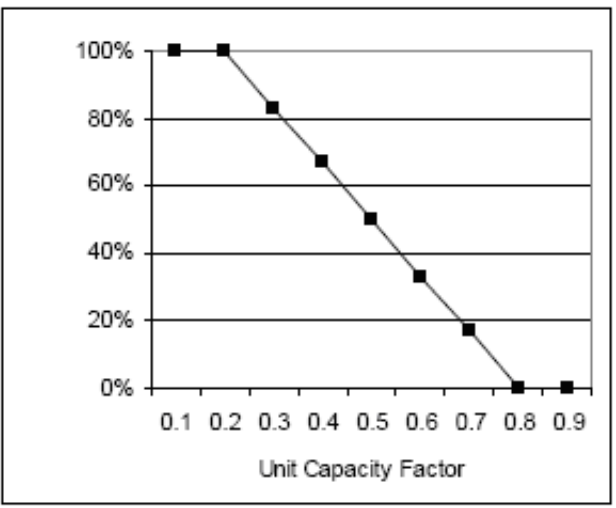
Emissions data in eGRID

- **Basis**
  - **Monitored data reported to EPA's Acid Rain Program, predominantly from continuous emission monitors (CEMs)**
  - **DOE's Energy Information Administration (EIA) electricity survey data used in calculations with EPA emission factors**
  - **(Hg) EPA's 2000 large municipal solid waste combustion database**
  - **(Hg) EPA's 1999 updated to 2001 ICE coal-fired boilers mercury emission file**
- **CO_2, SO_2, NO_x, CH_4, and N_2O emissions**
  - **Unadjusted emissions**
  - **Renewable methane adjustment for NO_x, and SO_2, CH_4, and N_2O**
  - **All biomass adjustment for CO_2**
  - **Sum emissions to the plant level**
  - **CHP plant adjustment**

Output Emission Rates

- **Notes about output emission rates in general**
  - **Do include adjustments for CHP and biogenic fuels**
  - **Do <u>not</u> include transmission & distribution line losses**
  - **Do <u>not</u> include life-cycle emissions (e.g. extraction, processing and transportation of fuels)**

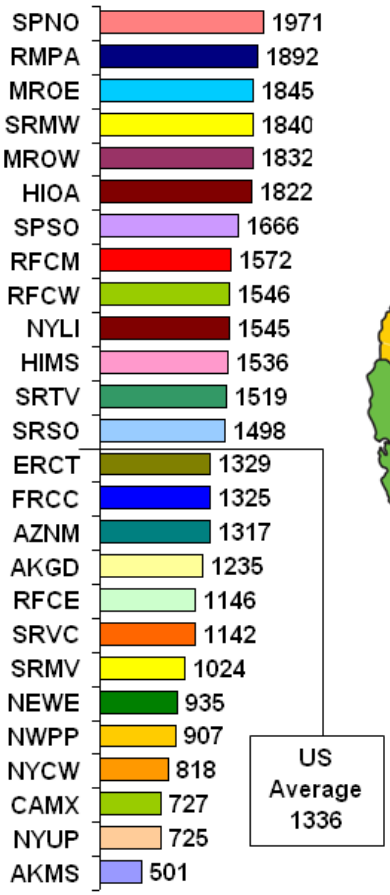
- **Total vs. Non-baseload**
  - **for each aggregation level**

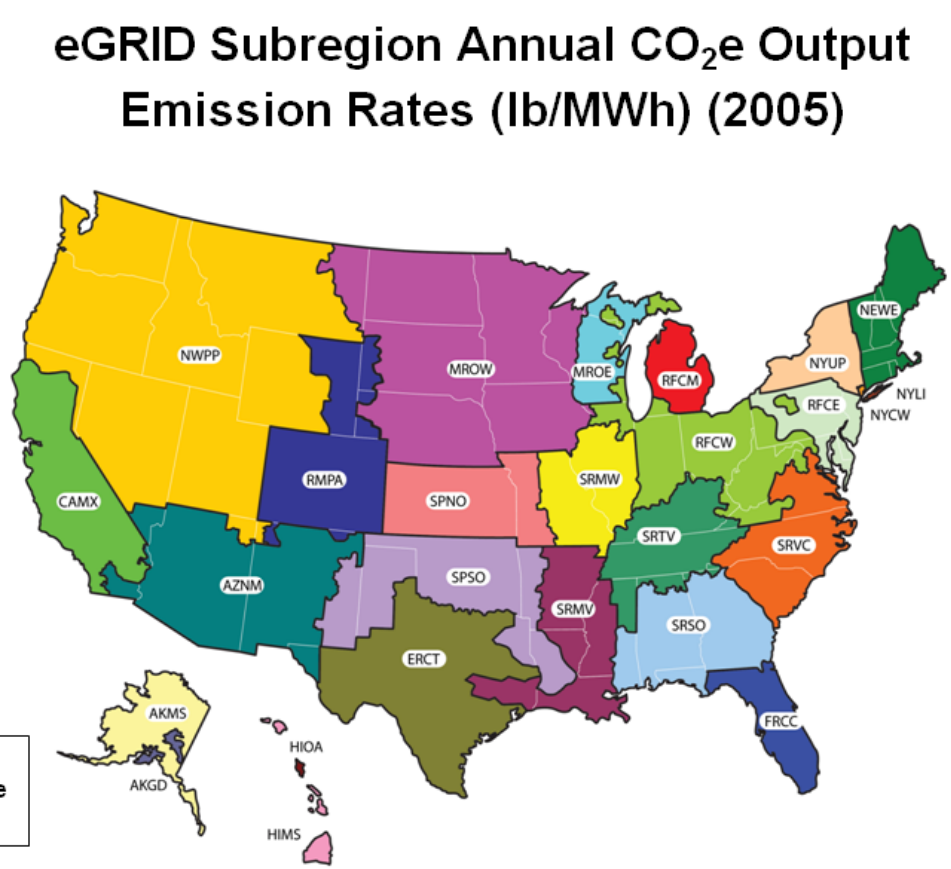


- Total – emissions (adjusted) from all plants divided by net generation from all plants
- Non-baseload – combustion only plants (or units) with capacity factor relationship determining proportion of the plant's emissions and generation that is "non-baseload"
  - » High capacity factor (c.f. >= 0.8) considered baseload
  - » Low capacity factor (c.f. <= 0.2) considered all non-baseload
  - » Other capacity factor (0.2 < c.f. < 0.8) considered partial non-baseload

Output Emission Rates

- **eGRID subregion vs. State**
  - **State boundaries do not define the reality of the electric grid**
  - **eGRID subregions minimize import-export issues**





Conclusions

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Contact Information

eGRID

eGRID Feedback page:

http://www.epa.gov/cleanenergy/energy-resources/egrid/feedback.html

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