THE EMISSIONS & GENERATION RESOURCE INTEGRATED DATABASE FOR 2012 (eGRID2012) TECHNICAL SUPPORT DOCUMENT

Prepared for:

U.S. Environmental Protection Agency
Office of Atmospheric Programs
Clean Air Markets Division
Washington, DC 20460

Prepared by:
TranSystems|E.H. Pechan, formerly E.H. Pechan & Associates, Inc.
5528-B Hempstead Way
Springfield, VA 22151

April 2012

Contract No. EP-D-06-001
Work Assignment No. 2-04

Technical Support Document

Emissions & Generation Resource Integrated Database

eGRID

Data Year 2009

U.S. Environmental Protection Agency Office of Atmospheric Programs

Prepared by TranSystems|Pechan, formerly E.H. Pechan & Associates, Inc.

eGRID2012 Version 1.0

April 2012

NOTICES

This document has been reviewed by the Clean Air Markets Division (CAMD), Office of Atmospheric Programs (OAP), U.S. Environmental Protection Agency (EPA), and approved for distribution.

This document is available to the public through the EPA eGRID website at http://www.epa.gov/egrid .

ACKNOWLEDGMENTS

This edition of eGRID was developed under the leadership of EPA's Mr. Art Diem, Clean Air Markets Division (CAMD), and TranSystems|E.H. Pechan' eGRID Team Manager, Dr. Susy Rothschild, who also prepared all the earlier editions of eGRID. Ms. Cristina Quiroz, Team member and Environmental Engineer at TranSystems|E.H Pechan, provided valuable analysis and support. The eGRID system was conceived of by Mr. Rick Morgan, former EPA Senior Energy Analyst in the Office of Atmospheric Programs. The cover graphics were supplied by the National Renewable Energy Laboratory.

CONTENTS

TABLES

Page

FIGURES

Page

[This page intentionally left blank.]

ABBREVIATIONS AND ACRONYMS

40 CFR Part 75	Code of Federal Regulations Title 40 Part 75, which specifies the air emissions monitoring and reporting requirements delineated in EPA regulations
AB 32	Assembly Bill 32 - California Global Warming Solutions Act
AR4	Fourth Intergovernmental Panel on Climate Change Assessment
BACT	Best Available Control Technology
BBtu	Billion Btu
Btu	British thermal unit
CAMD	Clean Air Markets Division
CEM	Continuous Emissions Monitoring
CHP	Combined heat and power (cogeneration)
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DOE	U.S. Department of Energy
EEA	Energy and Environmental Analysis, an ICF International Company
EF	Emission factor
eGRID	Emissions & Generation Resource Integrated Database
eGRID96	Emissions & Generation Resource Integrated Database for the year 1996 (1995 data)
eGRID97	Emissions & Generation Resource Integrated Database for the year 1997 (1995-1996 data)
eGRID2000	Emissions & Generation Resource Integrated Database for the year 2000 (1996-1998 data)
eGRID2002	Emissions & Generation Resource Integrated Database for the year 2002 (1996-2000 data)
eGRID2006	Emissions & Generation Resource Integrated Database for the year 2006 (2004 data)
eGRID2007	Emissions & Generation Resource Integrated Database for the year 2007 (2004 and 2005 data)
eGRID2010	Emissions & Generation Resource Integrated Database for the year 2010 (2007 and 2005 and 2004 data)
eGRID2012	Emissions & Generation Resource Integrated Database for the year 2012 (2009 and 2007, 2005, and 2004 data)
EGC	Electric generating company
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
ERG	Eastern Research Group
ETS	Emissions Tracking System
FERC	Federal Energy Regulatory Commission
FIPS	Federal Information Processing Standards
GATS	Generation Attribute Tracking System
GHG	Greenhouse gas
GIS	Geographic Information System
GWh	Gigawatt-hour
GWP	Global warming potential
Hg	Mercury
HHV	Higher heating value
ICF	ICF International

ID	Identifier
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Planning Model (developed by ICF)
ISO	Independent System Operator
kWh	Kilowatt-hour
LAER	Lowest Achievable Emission Rate
lb	Pound
MISO	Midwest Independent Transmission System Operator
MMBtu	Million Btu
MMcf	Million cubic feet
MSW	Municipal Solid Waste
MW	Megawatt
MWC	Municipal Waste Combustor
MWh	Megawatt-hour
NATCARB	Distributed National Carbon Sequestration Database and Geographic Information System
NERC	North American Electric Reliability Corporation
NESCAUM	Northeast States for Coordinated Air Use Management
NETL	National Energy Technology Laboratory
NGO	Nongovernmental Organization
NIST	National Institute of Standards and Technology
NO_x	Nitrogen oxides
NREL	National Renewable Energy Laboratory
N_2O	Nitrous oxide
OAP	Office of Atmospheric Programs
OMEGA JV	Ohio Municipal Electric Generation Agency Joint Ventures
ORIS	Office of the Regulatory Information System
ORISPL	Office of the Regulatory Information System PLant code
ORNL	Oak Ridge National Laboratory
OTC	Ozone Transport Commission
OTR	Ozone Transport Region
PCA	Power control area
RACT	Reasonably Available Control Technology
RECS	Renewable Energy Credits
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standards
RTO	Regional Transmission Organization
SAR	Second Intergovernmental Panel on Climate Change Assessment
SAS	Statistical Analysis System
SO_2	Sulfur dioxide
TAR	Third Intergovernmental Panel on Climate Change Assessment
TS|Pechan	TranSystems|E.H. Pechan, formerly E.H. Pechan & Associates, Inc.
USBIA	U.S. Bureau of Indian Affairs
USBR	U.S. Bureau of Reclamation
USCE	U.S. Army Corps of Engineers

SECTION I. INTRODUCTION

The Emissions & Generation Resource Integrated Database (eGRID) is a comprehensive source of data on the environmental characteristics of almost all electric power generated in the United States. The preeminent source of emissions data for the electric power sector, eGRID is based on available plant-specific data for all U.S. electricity generating plants that provide power to the electric grid and report data to the U.S. government. Data reported include generation in megawatt-hour (MWh); resource mix (for renewable and nonrenewable generation); emissions in tons for carbon dioxide (CO_2), nitrogen oxides (NO_x), and sulfur dioxide (SO_2); emissions in pounds for methane (CH_4), nitrous oxide (N_2O) and mercury (Hg); emission rates for CO_2, NO_x, and SO_2 (in both pounds per megawatt-hour [lb/MWh]) and pounds per million British thermal unit [lb/MMBtu]) and for CH_4, N_2O, and Hg (in pounds per gigawatt-hour [lb/GWh]) and Hg (in pounds per billion Btu [lb/BBtu]); heat input in MMBtu; and nameplate capacity in megawatts (MW). eGRID reports this information on an annual basis (as well as by ozone season for NO_x emissions and emission rates, net generation and resource mix, and heat input) at different levels of aggregation (plant, companies, and grid regions of the country).

The newest and eighth edition of eGRID, eGRID2012 Version 1.0, released in April 2012, includes one Excel workbook with year 2009 data. The eGRID workbook includes eight year 2009 data files – boiler, generator, plant, state, power control area, eGRID subregion, NERC region, and U.S. -- and a ninth file that displays the grid gross loss and the variables that are used in its estimation for year 2009. For this eGRID edition, eGRID2012's date in the name represents the year in which the eGRID data have been released.

Previous releases of eGRID include the following:

- The 1996 eGRID (eGRID96) was first released in December 1998; the 1997 eGRID (eGRID97) with 1996 and 1997 data, was first released in December 1999; and the 2000 eGRID (eGRID2000), with 1996 and 1997 data as in eGRID97, and 1998 data, was released in March and September 2001.

- eGRID2002, with preliminary 2000 data, was first released as Version 1.0 in December 2002 and with 1996-2000 data as Version 2.0 in April 2003 and Version 2.01 in May 2003.

- eGRID2006 Version 1.0, with the year 2004 plant spreadsheet file, was first released in December 2006; Version 2.0, which includes one Excel workbook with an updated plant file, as well as the boiler and generator files for year 2004, was released in early April 2007; and Version 2.1, with the complete set of files – boiler, generator, plant, state, EGC location (operator)- and owner-based, parent company location (operator)- and owner-based, power control area, eGRID subregion, and North American Electric Reliability Corporation (NERC) region – was released in late April 2007 and updated for typos in May 2007.

- eGRID2007 Version 1.0 was released in October 2008 and Version 1.1 was released in January 2009, both with two Excel workbooks with year 2005 data (plant and aggregation) and one Excel workbook with years 2004 and 2005 data (ImportExport).

- eGRID2010 Version 1.0 was released on February 23, 2011 and Version 1.1 was released May 20, 2011, including three Excel workbooks with year 2007 data as well as data for

years 2004 and 2005 (the same as those included in eGRID2007). Import-export data for years 2007, 2005, and 2004 are also included.

eGRIDweb version 1.0, a web-based eGRID user friendly application with years 2005 and 2004 eGRID2007 data, was released on April 27, 2009 by the U.S. EPA. For further information about this application, which allows the user to select, view, print, and download eGRID data; read the eGRIDweb Users Manual (TS|Pechan, 2009) that can be downloaded from the eGRID website or the Help tab on the application, which can be accessed either at http://cfpub.epa.gov/egridweb/index.cfm or through the eGRID website, http://www.epa.gov/egrid. This web-based application supplants an earlier one that was downloaded onto a user's PC and displayed data years 1996-2000 for eGRID2002; see that Users Manual for details (TS|Pechan, 2003b).

Three papers have been written to clarify issues and respond to questions about eGRID. The first one, "Total, Non-baseload, eGRID Subregion, State? Guidance on the Use of eGRID Output Emission Rates" (Rothschild and Diem, 2009), can be obtained from the EPA website, http://www.epa.gov/ttn/chief/conference/ei18/session5/rothschild.pdf, or downloaded from the eGRIDweb Reports tab. The second one, "The Value of eGRID and eGRIDweb to GHG Inventories" (Rothschild. Diem, Quiroz, and Salhotra, 2010), presented at the EUEC 2010 Environmental Conference, is available for download from the eGRID website at http://www.epa.gov/cleanenergy/documents/egridzips/The_Value_of_eGRID_Dec_2009.pdf. The third one, "eGRID: An Efficient Way to Value the GHG Emissions Reduction Effects of Energy Efficiency" (Diem, Rothschild, and Quiroz, 2011), is a paper that supplemented a poster presentation at the Boston August 2011 International Energy Program Evaluation Conference.

Further, in January 2012, "eGRID Data for Carbon Footprinting Electricity Purchases," (Diem, Rothschild, and Quiroz, 2012a) was presented at the EUEC 2012 Environmental Conference; and a paper/poster/podium presentation for "When to Use Which eGRID Data Year of GHG Emission Factors: Several Scenarios Presented" (Diem, Rothschild, and Quiroz, 2012b) has been accepted to the EPA 2012 International Emission Inventory Conference in August 2012.

Although eGRID is based on more than existing Federal data sources, its development required substantial attention to quality control. Accurate matching of entities from different databases required great care, even where identification codes were available. Inconsistencies between data sources, missing data, and ambiguous data necessitated adjustments to values of individual data elements, especially identification data. In general, however, questionable data have not been altered, except with regard to the relationship of plants to the power grid.

This document provides a description of the eGRID2012 year 2009 data elements in the 8 Excel spreadsheet files for each level of aggregation, as well as the grid gross loss file. Section II provides a summary of the database; Section III is the Methodology Section and presents the methodology for emissions estimations, including adjustments for biomass and combined heat and power (CHP), among other issues; Section IV includes discussion of eGRID specific identification codes, name changes and associations; and Section V describes the data elements in detail. There is a set of Reference citations in Section VI and two Appendices – Appendix A, which includes the file structure, and Appendix B, which includes the eGRID subregion and NERC region representational maps (which remain unchanged from the previous edition of eGRID) (NERC, 2012b).

SECTION II. SUMMARY OF eGRID2012 DATA

A. eGRID FILES

eGRID2012 contains electric power data at different levels of aggregation. As the database name implies, the focus of the data files is on two areas: generation and emissions. Generation is expressed in both MWh and as a percentage (called "resource mix" – generation of a certain fuel or resource type divided by total generation). CO_2, NO_x, and SO_2 emissions are expressed in tons and CH_4, N_2O, and Hg emissions are expressed in pounds. Emission rates are expressed in lb/MWh, lb/MMBtu for CO_2, NO_x, and SO_2; in lb/GWh for CH_4, N_2O, and Hg; and in lb/BBtu for Hg. The measurement units are United States units, not metric units.

Data users should take note that eGRID's emissions and emission rates are calculated at the sources of generation and do not account for losses from transmission and distribution infrastructures. Please refer to section IIIA9c on p. 17 for how to account for line losses when assigning emission rates to estimate indirect emissions associated with electricity purchases. Aggregated eGRID data only accounts for U.S. generation that takes place within the aggregated area and does not account for any electricity that is imported from or exported to other areas. The grid gross loss calculation, however, does account for U.S. regional interchanges with other U.S. regions as well as Canada and Mexico.

eGRID2012 includes not only year 2009 data but also the year 2004 data from eGRID2006, which were configured to reflect the industry's structure as was known by October 1, 2006; the year 2005 data from eGRID2007, which were configured to reflect the industry's structure as was known by December 21, 2007; and the year 2007 data from eGRID2010, which were configured to reflect the industry's structure as was known by December 31, 2010. Only certain eGRID files can be linked from year 2009 to years 2007, 2005, or 2004. The files that can be linked include the NERC region (by NERC acronym), eGRID subregion (by eGRID subregion acronym), state (by postal state abbreviation), plant (by eGRID plant sequence number), and U.S.

The eGRID year 2009 plant data are linked to the year 2007 plant data with the inclusion of the year 2007 plant file's SEQPLT07 variable in the year 2009 plant file; are linked to the year 2005 plant data with the inclusion of the year 2005 plant file's SEQPLT05 variable in the year 2009 plant file; and linked to the year 2004 plant date with the inclusion of the year 2004 plant file's SEQPLT04 variable in the year 2009 plant file – when the plants match. (Although most plants will match on ORISPL, there are some exceptions, so it is completely accurate to match from year 2009 with SEQPLT09 to year 2007, to year 2005, and to year 2004 using SEQPLT07, SEQPLT05, and SEQPLT04 respectively).

The year 2009 data are displayed in one eGRID2012 year 2009 workbook. This workbook includes a Table of Contents; the boiler, generator, plant, state, power control area, eGRID subregion, NERC region, and U.S files; and the new year 2009 grid gross loss file. The workbook can be downloaded from the EPA eGRID web site, http://www.epa.gov/egrid, along with Summary Tables and this document.

The data were originally processed on the EPA IBM mainframe using SAS, the Statistical Analysis System software.

The eight eGRID2012 data aggregation files are:

- BLR (boiler), with 5,560 year 2009 records;
- GEN (generator), with 17,484 year 2009 records;

- PLNT (plant), with 5,492 year 2009 records with non-zero generation and/or unadjusted heat input;
- ST (state), with 51 year 2009 records;
- PCAL (power control area), with 119 year 2009 records in the file;
- SRL (eGRID subregion), with 26 eGRID subregion year 2009 records in the file;
- NRL (NERC region), with 10 NERC region year 2009 records in the file; and
- US, with 1 year 2009 U.S. totals record.

The number of variables in each of the eight aggregation files varies, with 34 in BLR, 15 in GEN, 164 in PLNT, 111 in ST, 111 in PCAL, 113 in SRL, 111 in NRL, and 109 in US. The first variable in each file is a unique sequence number for that file. The boiler file is sorted by state postal code abbreviation, plant name, plant code, and boiler ID. The generator file is sorted by state postal code abbreviation, plant name, plant code, and generator ID. The plant file is sorted by state postal code abbreviation, plant name, and plant code. The state file is sorted by state postal code abbreviation, the power control area file is sorted by power control area name, the eGRID subregion file is sorted by eGRID subregion name, and the NERC region file is sorted by NERC region acronym.

The new year 2009 grid gross loss file is also included as the last tab in the eGRID workbook, eGRID2012V1_0_year09_DATA.xls. See Part B, What's New in eGRID2012, for further information.

The file structure for each of the files whose data are displayed in eGRID2012V1_0_year09_DATA.xls is included in Appendix A. The file structure also includes a description of the variables and the original data sources. The file structure indicates which variables and/or variable descriptions in year 2009 are new or different from those in year 2007.

B. WHAT'S NEW IN eGRID2012

Data file changes in eGRID2012 for year 2009 data include the following:

- Because of budgetary issues, year 2009 data are trimmed by eliminating the updated operator, owners, nufront, and parent companies to a specified year 2012 date. The operators and owners (and plant name) displayed in the eGRID plant file for year 2009 are as reported in the 2009 EIA-860. There are no associated operator parent companies in the plant file and there are no aggregation files for EGC operator-based, EGC owner-based, parent company operator-based, or parent company owner-based data in the final eGRID workbook.

- The three separate eGRID Excel workbooks have been combined into one larger Excel workbook with ten tabs (in a ZIP file).

- The derivation and data sources for the EIA-based state level grid gross loss have been replaced by the FERC- and EIA-based grid gross loss, beginning with year 2009. Consequently, the state import-export files have not been developed for year 2009. A new methodology for estimating grid gross losses has been employed using EIA utility sales data, FERC-714 power control area/balancing authority generation, and FERC-714 interchange data that are summed to the grid level.

eGRID2012 includes several new data elements delineated below:

- EPA/CAMD unit-level program codes as a replacement for the NBP flag in the boiler file;
- eGRID subregion annual CO_2 equivalent non-baseload output emission rate; and
- Plant associated ISO/RTO territory.

Some modifications have been made to eGRID plant file variables:

- For year 2007 data, only the EIA-923 prime mover level data (collected under EIA-906 in earlier years) were used for adjustment to the CAMD CO_2 emissions. But, beginning with year 2009 data, the biomass fuel components' CO_2 CAMD emissions are adjusted to zero by the same biomass fuel component percentage as that in the matching EIA-923 unit-level data (or if necessary, the matching EIA-923 prime mover level data). In addition, beginning with year 2009 data, the biogas components' CAMD-based CH_4, N_2O, SO_2, and NO_x emissions are also adjusted by the same biogas fuel component percentage as that in the matching EIA-923 unit-level data (or if necessary, the matching EIA-923 prime mover level data) for the adjusted CH_4, N_2O, SO_2, and NO_x CAMD emissions. RMBMFLAG, the biomass flag, is assigned a value of 7100 if there is a biomass adjustment to CAMD CO_2 emissions or a value of 71 if there are biogas adjustments to CAMD emissions.

Methodological changes in eGRID2012 for year 2009 data include the following:

- EIA-923 unit/boiler level data included.
- A few updated GHG emission factors (EF).
- Some updated latitude-longitude coordinates based on 2010 EIA's data (EIA, 2011e).
- Ozone season net generation from EPA/CAMD is derived differently from year 2007's. Beginning with year 2009 data, for fuel-type output emissions rates, rather than divide the total adjusted emissions by the total plant net generation (as done for year 2007 data and earlier), if a plant is partially a combustion plant (i.e., it includes both combustion and non-combustion generators), then the total plant emissions are instead divided by the combustion net generation for that plant.

Methodological changes are detailed in Section III, the Methodology Section. Year 2004, 2005, and 2007 data included in eGRID2012 are unchanged from the data in previous eGRID editions, except that in the plant file for year 2007, the longitude field is corrected for those plants whose longitude is -99.xx (they had inadvertently been replaced by 'N/A' in the previous edition). For more information about the year 2007 data, see the eGRID2010 Technical Support Document (TS|Pechan, 2010). For methodology from previous years, see their Technical Support Documents (TS|Pechan, 2008, 2007, 2003a).

C. USES AND USERS OF eGRID

eGRID data support a wide variety of users globally through a wide variety of uses. eGRID is valuable to those in the Federal Government, state and local governments, non-governmental organizations,

academia, and provides constructive direction to companies who are generally seeking environmental information from the electric power sector in the United States. eGRID is most often used for the estimation of indirect emissions from electricity purchases, in GHG inventories, for carbon footprinting, and for estimating avoided emissions from programs and projects that would reduce the consumption for grid supplied electricity. eGRID data are cited by emission inventory and registry protocols, by various emission calculation tools and applications, by many academic papers, by many consultants, and is used for many research applications and efforts.

Within EPA, eGRID data are used in the following applications and programs: Power Profiler web application, Climate Leaders protocols, ENERGYSTAR's Portfolio Manager and Target Finder, Waste Wise Office Carbon Footprint Tool, the Personal Greenhouse Gas Emissions Calculator, the Greenhouse Gas Equivalencies Calculator, and the Green Power Equivalency Calculator.

When the EPA announced its "Apps for the Environment" challenge using EPA data, developers across the U.S. responded. EPA announced the winners on November 8, 2011 and the two top winning apps -- Light Bulb Finder (http://www.lightbulbfinder.net/) and Hootroot (http://hootroot.com/) use eGRID data for a mobile app and/or a web app, as did several other entries (EPA, 2011b). Another of the winning entries, Joulebug (http://joulebug.com/) uses eGRID data and developed a game to save energy as both a web and free iPhone app.

In 2010, Executive Order 13514 was issued, requiring Federal agencies to "measure, report, and reduce their greenhouse gas emissions from direct and indirect activities." The Federal GHG Accounting and Reporting Guidance accompanied this order and recommended using eGRID non-baseload emission rates to estimate the scope 2 emission reductions from renewable energy.

One of the most popular uses of eGRID is to determine the indirect GHG emissions from electricity purchases and avoided GHG emissions from projects and programs that reduce the demand for grid supplied electricity. For example, The Climate Registry, the California Climate Action Registry, California's Mandatory GHG emissions reporting program (AB 32) (CARB, 2007), and the Greenhouse Gas Protocol Initiative cite eGRID for use in estimating scope 2 (indirect) GHG emissions from electricity purchases in the United States. Most carbon footprint calculators that are applicable to the United States use eGRID data.

The website, www.fueleconomy,gov, resulting from an EPA-U.S. Department of Energy (DOE) partnership, provides fuel economy information that consumers can use to make knowledgeable decisions when buying a car. The information can also help consumers achieve the best fuel economy from currently owned cars. This website showcases its Greenhouse Gas Emissions for Electric and Plug-in Hybrid Electric Vehicles calculator, http://www.fueleconomy.gov/feg/label/calculator.jsp, which uses eGRID data to estimate the total GHG emissions from electric and plug-in hybrid vehicles, including emissions from electricity used to charge the vehicle. eGRID is cited as a data source at http://www.fueleconomy.gov/feg/label/calculations-information.shtml . In a similar vein, the Union of Concerned Scientists (UCS, 2012) published a 2012 report using eGRID data to support its study results that it is advantageous to switch to a battery-powered vehicle, although there are wide differences in both real electricity costs and GHG emissions, depending on the region in which you live.

eGRID data are also used for Galvin Electricity Initiative's "Perfect Power Seal of Approval" (http://www.galvinpower.org/sealofapproval) tool whose metrics help consumers to evaluate the performance of the electricity grid (Galvin, 2011). EIA's National Energy Modeling System (NEMS)'s electricity market module supply regions are the eGRID subregions; the map used in their 2011 documentation (Figure 3) uses the eGRID subregion map and subregion colors, changing a few names (EIA, 2011d).

eGRID is also used by other Federal Government agencies such as Oak Ridge National Laboratory (ORNL) for their Combined Heat and Power Calculator, the National Energy Technology Laboratory (NETL) for their sponsored Distributed National Carbon Sequestration Database and Geographic Information System (NATCARB), and the National Renewable Energy Laboratory (NREL) for their micropower distributed generation optimization model named HOMER.

States and local governments rely on eGRID data for electricity labeling (environmental disclosure programs), emissions inventories, and registries as well as for efforts to analyze air emissions from the electric power sector. Several states have published state specific emissions information from eGRID or have used eGRID to inform policy decisions. The Maryland Department of the Environment (MDE) determined eligibility for participation in the Voluntary Renewable Set-Aside Account (VERSA) using eGRID factors (Maryland, 2010); and in 2009, the Delaware Valley Regional Planning Commission (DVRPC) -- a nine county region in Pennsylvania and New Jersey -- completed a 2005 GHG Inventory in support of regional efforts to quantify and reduce emissions associated with climate change, using eGRID factors (DVRPC, 2010).

Tracking Systems for Renewable Energy Credits (RECS), such as ISO-New England's Generation Information System (GIS) and PJM's Generation Attribute Tracking System (GATS) utilize eGRID data. ISO New England uses eGRID rates in developing the 2008 New England Electric Generator Air Emissions Report (http://www.iso-ne.com/genrtion_resrcs/reports/emission/2008_emissions_report.pdf).

eGRID is additionally used for nongovernmental organizations' (NGOs) tools and analysis. The following is a list of some known users and applications of eGRID data: Northeast States for Coordinated Air Use Management (NESCAUM) analysis, Powerscorecard.org, the Ozone Transport Commission's (OTC) Emission Workbook, the Greenhouse Gas (GHG) Protocol Initiative, the Rocky Mountain Institute's Community Energy Finder, Leonardo Academy's "Cleaner and Greener Environmental Program," the National Resource Defense Council's Benchmarking Air Emissions, The Berkeley Institute of the Environment, Cool Climate Carbon Footprint Calculator, the Climate and Air Pollution Planning Assistant (CAPPA), Emission Solution's Carbon Footprint Calculator, and the Clean Air software developed by the International Council for Local Environmental Initiatives (ICLEI), The United States Department of Transportation Federal Transit Administration (FTA), The Google PowerMeter, a free energy monitoring to calculate your home's energy consumption online, The National Public Radio – U.S. Electric Grid, The International Code Council (ICC), the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), The Local Energy Efficiency Policy Calculator (LEEP - C) released by the American Council for an Energy-Efficient Economy (ACEEE), and the World Resource Institute's Carbon Value Analysis Tool (CVAT).

Additionally, Brighter Planet, with its CM_1 web service, has developed a model to estimated GHG emissions from electricity use that uses both the eGRID subregion GHG emission factors (EF) as well as the grid gross loss data for their estimates (Brighter Planet, 2010).

The Center for Global Developments' Carbon Monitoring for Action Database (CARMA) at carma.org, which contains information about carbon emissions for power plant and companies in the U.S. as well as other countries, used eGRID year 2005 data as a base, according to the Center's David Wheeler (Wheeler, 2007). eGRID data also underlie the Global Energy Observatory U.S. power plant database.

D. eGRID SOURCES

eGRID is developed from a variety of data collected by the U.S. Environmental Protection Agency (EPA), and the Energy Information Administration (EIA). Federal data sources include:

- EPA, Clean Air Markets (EPA/CAMD) Annual and Ozone Season Emissions data collected under 40 CFR Part 75 (EPA, 2011a);
- EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010 (EPA, 2012b);
- EIA, EIA-860: Annual Electric Generator Report (EIA, 2011a);
- EIA, EIA-861: Annual Electric Power Industry Report (EIA, 2011b);
- EIA, EIA-923: Power Plant Operations Report (EIA, 2011c);
- FERC, FERC-714: Annual Electric Balancing Authority Area and Planning Area Report (FERC, 2011); and
- An additional source of eGRID data, the North American Electric Reliability Corporation (NERC) [formerly the North American Electric Reliability Council] (NERC, 2012a and 2012b), is quasi-governmental since it was certified by FERC in July 2006 as the "electric reliability organization."

Data displayed in eGRID are derived from the above data sources; EPA does not collect data directly from electric generators for eGRID. Inconsistencies between data sources, missing data, and ambiguous data occasionally necessitate adjustments to values of individual data elements. When necessary, EPA substitutes data from secondary sources or default values. EPA also updates grid configuration data. In general, however, data are displayed as reported; this may lead to plant file outliers to which users should be alert.

SECTION III. eGRID METHODOLOGY

This section describes eGRID development methodologies that are not transparent. Some methods used for eGRID2012 are modified or refined from previous editions of eGRID and are so noted in this section.

A. ESTIMATION OF EMISSIONS

Emissions (CO_2, NO_x, SO_2, Hg, CH_4, and N_2O) in eGRID are estimated using data from a variety of sources from EPA and EIA (see SOURCEM variable in the eGRID plant file). Carbon dioxide (CO_2) is a product of fossil fuel combustion and is the primary greenhouse gas (GHG) emitted by human activities that is contributing to global climate change; nitrogen oxides (NO_x) is a product of fossil fuel combustion and is a precursor to the formation of ozone, or smog, and also contributes to acid rain and other environmental and human health impacts; sulfur dioxide (SO_2) is an air pollutant emitted primarily by power plants burning fossil fuels, especially coal, which is a precursor to acid rain and is associated with other environmental and human health impacts; and mercury (Hg) is a toxic heavy metal that is a byproduct of the combustion of fossil fuels, especially coal. Methane (CH_4) and nitrous oxide (N_2O), two other GHG emitted by electric power generators, are included in eGRID for years 2009, 2007, and 2005, beginning at the plant level. The emissions data for the three GHG are used as default factors in a variety of climate protocols (including The Climate Registry, The California Climate Action Registry, California's Mandatory GHG emissions reporting program (AB 32), and EPA's Climate Leaders) for indirect emissions estimation calculations.

Although many small units, as well as some nonutilities and cogenerators, are not subject to EPA/CAMD's data reporting, the vast majority of emissions reported in eGRID are from the EPA/CAMD data. Sources that report to EPA/CAMD for year 2009 data are generally utility and nonutility steam units with at least 25 MW capacity, nonsteam units – gas turbines, combined cycles, internal combustion engines – that came on-line after 1990, and independent power producers/cogenerators that sell a specific amount of electricity.

Plant level emissions in eGRID are built by summing its component parts – which could simply be unit level boilers and/or turbines or a combination of boilers and prime movers representing an aggregation of like generating units. In general, eGRID plant level emissions reflect a combination of monitored and estimated data. Emissions and emission rates in eGRID represent emissions and rates at the point(s) of generation. They do account for losses within the generating plants (net generation). However, they do not take into account any power purchases, imports or exports of electricity into a specific state or any other grouping of plants; and they do not account for any transmission and distribution losses between the points of generation and the points of consumption. Also, eGRID does not account for any pre-combustion emissions associated with the extraction, processing and transportation of fuels and other materials used at the plants or any emissions associated with the construction of the plants.

eGRID emissions and heat input that are displayed in the boiler file are unadjusted, while both adjusted and unadjusted emissions and heat input are displayed in the plant file. Adjusted emissions and heat input as well as generation are used in calculating plant emission rates and for all aggregation emission values.

1. Unadjusted Emission Estimates for Year 2009

Emissions that are reported and estimated for eGRID are initially unadjusted, including biomass GHG values, and are displayed at the plant (and boiler) level. Adjusted emissions (and heat input) are included in the plant file and all subsequent aggregation files. All emission rates in the plant file and all aggregation files are based on adjusted emissions, net generation, and adjusted heat input. Depending on

the source of data and the emissions type, component emissions are adjusted for biomass and then summed to the plant level before making the CHP adjustment specific to eGRID. Both the source(s) of emissions data and adjustment flags are provided in the plant file.

2. Annual Emission Estimates for CO_2, SO_2, and NO_x

Mass emissions in eGRID are estimated using data from a variety of sources. eGRID's primary source for CO_2, SO_2, and NO_x, data is EPA/CAMD's unit level emissions data. CO_2 is a greenhouse gas, while SO_2 and NO_x are not. SO_2 and NO_x are acid rain pollutants and have been regulated under the Clean Air Act Amendments for many years. If EPA/CAMD emissions are not reported, the emissions are generally estimated using fuel consumption – on a boiler-fuel level if the data are in the EIA-923 boiler level, and/or on a prime mover-fuel level if the data are only in the EIA-923 prime mover level file.

For estimating CO_2, the Intergovernmental Panel on Climate Change (IPCC) (IPCC, 2007) greenhouse gas (GHG) methodology using fuel consumption, a fuel-specific carbon coefficient, and the fuel-related fraction of carbon oxidized (beginning with year 2005 data, the IPCC's mandated change to a uniform oxidation fraction of 1 is used for all fossil fuels) is implemented. This method is also used in EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010 (EPA, 2012b, Annex 2 tables). CO_2 emission factors (EF), which are actually carbon coefficients, for year 2009 are obtained from two sources: EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010 (EPA, 2012b, Annex 2 tables), The Climate Registry's January 6, 2012 EF file (TCR, 2012), both of which use the EF from Table C-1 from EPA's Final Mandatory Reporting of Greenhouse Gases Rule (EPA, 2009) as the basis for their EF. If CO_2 emissions are estimated, whether for EPA/CAMD, EIA-923 boiler, or EIA-923 prime mover data, the emission factor is applied to fuel consumption (usually in MMBtu).

For SO_2, EPA-approved uncontrolled EF based on EPA's AP-42 EF (EPA, 2012a), sulfur content, and control efficiencies (if available), and fuel use are also used in the estimation of these emissions.

The following describes how NO_x emissions are estimated for cases in which EPA/CAMD emissions data are not reported or cannot be used. For steam boilers originating from the EIA-923, the controlled annual NO_x emission rate and heat input are used. For data originating from the EIA-923 prime mover level, for steam prime movers, fuel use and EPA-approved uncontrolled emissions factors (EPA, 2012a) are used; and for EIA-923 nonsteam prime movers, beginning with year 2004 eGRID data, a better method is used to calculate NO_x emissions for combined cycles, turbines, and internal combustion engines. NO_x EF were developed based on the prime mover technology, size, and location. The location is important due to the differing stringency of air pollution controls in some areas with severe air quality problems. For larger nonsteam generators, the factors were based on data from the EPA Reasonably Available Control Technology/Best Available Control Technology/Lowest Achievable Emission Rate RACT/BACT/LAER) Clearinghouse (EPA, undated2). The methodology also reviewed current RACT requirements for large generating facilities in regions with stringent limits in areas such as the Ozone Transport Region (OTR), California, and Texas. For smaller nonsteam generators (including small combustion turbines, microturbines and reciprocating engines), the methodology draws from several sources including the EPA CHP Partnership *Catalogue of CHP* (EPA, undated1) and the U.S. Department of Energy (DOE) *Gas-Fired Distributed Energy Resource Technology Characterizations* (DOE, 2003).

Geothermal emissions, albeit minimal, are estimated for CO_2, SO_2, and NO_x. While CO_2 is a gas in the geothermal reservoir, SO_2 and NO_x result from hydrogen sulfide combustion. The three pollutants' EF, obtained from a 2007 Geothermal Energy Association environmental guide (GEA, 2007), are applied to plant net generation, and differ depending on the type of geothermal plant (GEA, 2010, plus updates based on internet research). For a binary or flash/binary geothermal plant, there are no CO_2, SO_2, or NO_x EF; for a flash geothermal plant, there are no NO_x EF and small CO_2 and SO_2 EF; and for a dry steam

geothermal plant, there are small CO_2, SO_2, and NO_x EF. If a plant has operating (i.e., reported non-zero net generation) generators with different geothermal types, then the methodology is modified. In this case, appropriate geothermal type EF must be applied to the prime mover net generation for each of the different geothermal types of the plant generators.

3. Annual Emission Estimates for CH_4 and N_2O

In addition to CO_2, electric power plants also emit some CH_4, and N_2O GHG emissions. CH_4 and N_2O emissions are reported in pounds and are estimated by multiplying the fuel specific heat input in MMBtu by appropriate EF from Table C-2 of EPA's Final Mandatory Reporting of Greenhouse Gases Rule (EPA, 2009).

Nitrous oxide (N_2O) is an oxide of nitrogen that is not part of the NO_x subset of oxides of nitrogen. N_2O is a greenhouse gas, the emissions of which are contributing toward global climate change; NO_x is not a GHG. N_2O should not be confused with NO_X.

a. Global Warming Potential

Global Warming Potential (GWP) is a value assigned to a GHG so that the emissions of different gases can be assessed on an equivalent basis to the emissions of the reference gas, CO_2, which has a GWP of 1. Traditionally, the 100-year GWPs are used when calculating overall CO_2 equivalent emissions, which is the sum of the products of each GHG emission value and its GWP. Note: be sure when calculating the CO_2 equivalent that each of the GHG emission values has the same measurement units (either all in tons or all in pounds) since in eGRID, CO_2 are expressed in tons while both CH_4 and N_2O are expressed in pounds. Additionally, in order to compare emissions across previous data years', the GWP for the second (1996) IPCC assessment (SAR), is used, although there have been subsequent third (2001) (TAR) and fourth (2006) (AR4) assessments. A comparison of the three GWP for the three electric power GHG gases is presented in Table III-1 (EPA, 2012b, Table 1-3).

Table III-1. Comparison of 100-Year GWPs

Gas	SAR	TAR	AR4
CO_2	1	1	1
CH_4	21	23	25
N_2O	310	296	298

Beginning with year 2007 data, the CO_2 equivalent emissions (tons) and total output emission rate (in lb/MWh) is calculated (using the SAR GWP) at the plant and aggregation levels; and beginning with year 2009 data, the CO_2 equivalent s non-baseload output emission rate (in lb/MWh) is also calculated, but at the eGRID subregion level.

4. Annual Emission Estimates for Mercury (Hg)

No mercury emissions are included for year 2009 data since the previously employed estimation methods are likely to produce an overestimate of the emissions for boilers for which we have original 1999/2002 data. It is likely that air pollution control devices that affect Hg emissions have been installed on some of these boilers, but there are no Federal data available to measure their impact. Similarly, there are no currently available Federal Hg EFs for estimating mercury emissions for all electric power units. Because of current legal challenges relating to the regulation of Hg emissions from the electric power sector, EPA is not issuing any Hg data in eGRID in this edition. EPA may develop a new methodology for the estimation of Hg emissions in a future edition of eGRID.

5. Ozone Season Emission Estimates for NO_x

The ozone season is the five-month period from May through September when excessive levels of ozone, or smog, are most likely to form in the atmosphere due to a chemical reaction of nitrogen oxides with other pollutants in the presence of sunlight. EPA/CAMD provides ozone season NO_x emissions for many units that do not report annual emissions. Otherwise, for steam boilers and sampled plants with prime movers that report to the EIA-923 and are not covered by EPA/CAMD, monthly fuel quantity is provided so that five-month (May through September) ozone season NO_x emissions can be estimated; if the plant prime mover reports only annually to the EIA-923, then ozone season estimates are calculated as the annual estimates multiplied by 5/12.

6. Adjusted Emission Estimates

Emissions reported in eGRID represent emissions from fuel utilized only for electricity generation. Thus, for certain plants, there are two possible cases for which eGRID adjusts the emission estimates: if the plant is a CHP facility; and if components of the plant burn biomass, including biogas (such as landfill, methane, and digester [other biomass] gas). A biomass facility's adjusted emissions displayed in eGRID may be different from that reported in other EPA sources such as EPA/CAMD's emissions data.

There are two EPA Acid Rain Program (ARP) plants whose plant-prime mover EPA/CAMD emissions and heat input are adjusted to zero in eGRID; the unadjusted values are published for reference purposes. The net generation for two of these plant-prime movers is reported as zero even though positive fuel use is reported to the EIA-923. For 74th Street (ORISPL = 2504), the steam turbine prime mover data (the three unit level EPA reported emissions and heat input) are adjusted to zero, but the gas turbine adjusted emissions and heat input remain positive. A second plant, AES Redondo Beach LLC (ORISPL = 356), has five steam units that report positive emissions to EPA, but research revealed that one unit does not put electricity to the grid; this unit was assigned zero adjusted emissions and heat input**.**

7. Adjustments for Biomass

eGRID makes adjustments for biogas emissions, for biomass emissions other than biogas, and for solid waste emissions for specified pollutants. Solid waste typically consists of a mixture of biogenic materials – biomass such as wood, paper, and food waste – and "other fossil" materials – fossil-based materials such as plastics and tires. Thus, emissions from the biomass component of solid waste are adjusted exactly as non-biogas biomass emissions are adjusted, while emissions from the fossil component of solid waste are not adjusted.

Solid waste is split into the two components in eGRID so that adjustments can be made as needed. EPA's methodology for splitting MSW into the two components includes different splits for the MSW types. The MSW percentages for the MSW biomass component (called MSB) and the MSW fossil component (called MSF) are described in Table III-2 below (EIA, 2007). The type of MSW is obtained from an EPA data file (EPA, 2002).

Table III-2. Municipal Solid Waste MSB and MSF Splits

MSW Type	Variable(s)	MSB Split (%)	MSF Split (%)
Mass Burn	Heat Input, Generation	52.7%	47.3%
Mass Burn	Fuel Consumption	65.4%	34.6%
Refuse Derived Fuel	Heat Input, Generation	52.7%	47.3%
Refuse Derived Fuel	Fuel Consumption	75.1%	24.9%
Unknown	Heat Input, Generation	52.7%	47.3%
Unknown	Fuel Consumption	67.7%	32.3%

As with all biomass generation, CO_2 emissions from the biomass portion of solid waste are adjusted, but emissions from the remaining portion of solid waste are reported based on appropriate EF. The EF used don't take in consideration any control devices that may be present because there is no readily available nationwide information. Generation from supplemental fossil fuels co-fired with solid waste is identified if known and reflected in emission rates. This methodology has not changed. However, beginning with the year 2007 data, the biomass portion of solid waste combustion is shown in the unadjusted CO_2 emissions.

A flag in the plant file indicates whether there is any biomass adjustment and the type of adjustment. The possible adjustments for CO_2, NO_x, SO_2, CH_4, and N_2O emissions (and heat input) are explained below.

a. CO_2

Biomass is a fuel derived from organic matter such as wood and paper products, agricultural waste, or methane (e.g., from landfills). eGRID assumes that these materials are subject to the natural carbon cycle and, therefore, do not contribute to global warming. eGRID assigns zero CO_2 emissions to generation from the combustion of all biomass (including biogas) because these organic materials would otherwise release CO_2 (or other greenhouse gases) to the atmosphere through decomposition.

For those adjusted-for-biomass CO_2 emissions that are estimated, the biomass components are zeroed out in this edition, just as they have been for previous years of eGRID data. However, in this edition of eGRID, the CO_2 emissions from biomass are more comprehensively disclosed in the plant unadjusted emissions. The CO_2 emissions from biomass can be determined at a plant level by comparing the emissions and the unadjusted emissions at plants that have a biomass adjustment flag. If the CHP adjustment flag is also 1, to determine the biomass emissions, first calculate how much of the adjustment is accounted for from CHP using the electric allocation factor (since the CHP plant adjustment is applied last).

For the EPA/CAMD units that for a given prime mover whose matching EIA-923 prime mover burns some biomass fuel, the biomass fuel components' CO_2 CAMD emissions are adjusted by the same biomass fuel component percentage as reported in the EIA-923; prior to year 2007, these emissions, if CAMD-reported, were only zeroed out if the EPA/CAMD primary fuel was a biomass fuel. Beginning with year 2009 data, the biomass fuel components' CO_2 CAMD emissions are adjusted to zero by the same biomass fuel component percentage as that in the matching EIA-923 unit-level data (or if necessary, the matching EIA-923 prime mover level data). RMBMFLAG, the biomass flag, is assigned a value of 7100 if there is a biomass adjustment to CAMD CO_2 emissions. Similarly, the biogas fuel components' CO_2, CH_4, N_2O, SO_2, and NO_x emissions are adjusted by the same biogas fuel component percentage as that in the matching EIA-923 unit-level data (or if necessary, the matching EIA-923 prime mover level data). RMBMFLAG, the biomass flag, is assigned a value of 71 if there are biogas adjustments for CAMD emissions.

b. NO_x, SO_2, CH_4, and N_2O

NO_x, SO_2, CH_4, and N_2O emissions from generation powered by biogas (landfill gas and digester gas) are also adjusted in eGRID. Landfill gas and digester gas emissions must be flared in most cases if the gas is not consumed as useful energy. Therefore, eGRID assumes that biogas would have been flared if not used to generate electricity, so that eGRID adjusted emissions are the amount of incremental emissions attributable to utilizing biogas to generate electricity. Thus, emissions from these fuels are adjusted by decreasing the uncontrolled EF (used to estimate the emissions) by the emission factor represented by a typical flare. This methodology has not changed.

For NO_x, the EPA-approved flare emission factor is assumed to be 40 lb per million cubic feet (MMcf) of methane, 20 lb per MMcf of methane for landfill gas, and 26 lb per MMcf of methane for digester gas, and is subtracted from the respective original EPA-approved uncontrolled EF before being applied. For SO_2, CH_4, and N_2O, the EF are assumed to be the same as the flares', so there are no incremental SO_2, CH_4, and N_2O emissions attributable to utilizing biogas to generate electricity, and values of zero are assigned.

In eGRID, there are no fuel adjustments for NO_x, SO_2, CH_4, and N_2O emissions for biomass other than biogas. Beginning with year 2009 data, the biogas components' CAMD CH_4, N_2O, SO_2, and NO_x emissions are also adjusted by the same biogas fuel component percentage as that in the matching EIA-923 unit-level data (or if necessary, the matching EIA-923 prime mover level data) for the adjusted CH_4, N_2O, SO_2, and NO_x CAMD emissions. RMBMFLAG, the biomass flag, is assigned a value of 71 if there is a biogas adjustment to CAMD emissions.

8. Adjustments for CHP

CHP is a type of generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, or cooling purposes. CHP, also known as cogeneration, converts energy more efficiently than facilities that separately produce heat and electricity. The plants labeled as CHP in eGRID are an EPA designation based on a CHP file developed for DOE (EEA, 2011 updated). A flag in the plant file indicates if a plant is considered a CHP for purposes of eGRID. Since emissions reported in eGRID represent electricity generation only, emissions associated with useful thermal output – the amount of heat produced in a CHP facility that is used for purposes other than making electricity – are excluded from the adjusted emissions (and a plant's emissions data reported in eGRID may be different from that reported in other EPA sources). As in eGRID2010, the unadjusted emissions are shown only in the plant file.

eGRID's methodology is designed to share CHP's efficiency gains between electricity and useful thermal output. For CHP facilities in the year 2009 data, eGRID allocates emissions between electricity and thermal output using a plant level electric allocation factor that discounts the value of useful thermal output by 25%. If a plant is a CHP and has an electric allocation factor, it is applied to the emissions (and heat input) for the entire plant after any biomass adjustment has been made. Specifically, the adjusted value is the product of the electric allocation factor and the original value.

The methodology for estimating an electric allocation factor is as follows:

The useful thermal output value for year 2009 data can be calculated from EIA-923 data as 0.8 multiplied by (total heat input minus electricity heat input) MMBtu. The electric allocation factor is calculated as the ratio of the electricity heat output to the sum of the electricity and steam heat outputs, where

electricity heat output in MMBtu is the net generation MWh multiplied by 3.413 and steam heat output MMBtu is 0.75 multiplied by useful thermal output

If the useful thermal output is unknown, the electric allocation factor (ELCALLOC) is estimated given specific conditions. But, if there are non-zero values for both annual net generation and annual total heat input, an 8,500 Btu per kilowatt-hour (kWh) median plant nominal heat rate is assumed. Since actual heat rate equals (electric allocation factor multiplied by 1000 multiplied by heat input MMBtu) divided by (net generation MWh), then the electric allocation factor for CHP plants without a given useful thermal output is initially calculated as:

ELCALLOC = (8.5 * plant net generation MWh) / (unadjusted plant heat input MMBtu).

If, however, the plant's CHP prime mover has been designated steam and the heat rate is less than 22,747 Btu/kWh, then the electric allocation factor for the CHP plant is initially calculated as:

ELCALLOC = ((12.68 * plant net generation) / (unadjusted plant heat input)) - 0.17444.

For calculated electric allocation factors that fall below a specified minimum, additional adjustments are made as summarized in Table III-3 below.

Table III-3. Floors for Power to Heat Ratio and ELCALLOC

Type of CHP Prime Mover	Minimum ELCALLOC	Minimum Power to Heat Ratio
Coal or MWC Boilers	0.11765	0.10
All Other Boilers	0.06250	0.05
Gas Turbines	0.30556	0.33
Combined Cycles, IGCC	0.47183	0.67
Internal Combustion Engines	0.40000	0.50

The CHP electric allocation "floors" were derived from an analysis of the theoretical power-to-heat ratio of different CHP technologies and the actual operating characteristics of existing CHP systems. The power-to-heat ratio is largely a function of the CHP prime mover, its efficiency, and the amount and temperature of heat available from the system. In addition, the reported operating characteristics of a large number of CHP facilities as reported in the DOE ORNL CHP database (EEA, 2011) were reviewed. The combination of theoretical and reported characteristics was used to establish the minimum values for the electric allocation factors.

This methodology has not changed.

9. Emission Rate Estimates

Both output and input emission rates are calculated for eGRID, beginning with the plant level of aggregation. In addition to emission values, annual and ozone season net generation and heat input values (adjusted heat input values if it is a CHP) are required for emission rate calculations.

a. Generation

Net generation, in MWh, is the amount of electricity produced by the generator and transmitted to the electric grid; it does not include any generation consumed by the plant. If the generation consumed by the plant is greater than the gross generation, negative net generation will occur and be displayed in eGRID; this can further result in negative emission rates.

Plant-fuel-prime mover net generation for all prime mover types can be obtained from the EIA-923; (most) steam and nuclear generator unit level net generation can also be obtained from the EIA-923.

For sampled plants with EIA-923 net generation, generation is reported monthly and annually so that ozone season generation is calculated by summing up the generation for the five months of May through September. If there are no monthly data, ozone season generation is calculated as 5/12 of the annual generation. Net generation for those plant-prime movers (or entire plants) that did not report data to the EIA-923, but did report emissions to the EPA, is derived from EPA/CAMD data if there also is positive gross load generation in the EPA/CAMD data file.

The following methodology was employed for obtaining year 2009 net generation data:

Plant level net generation

To determine plant level net generation, use EIA-923 plant-prime mover annual and ozone season MWh net generation, if available. Ozone season net generation for those plants/generators that report monthly to the EIA-923 is calculated by summing the May through September net generation; for plants/units that report only annually to the EIA-923, the ozone season net generation is calculated as 5/12 of annual net generation.

If plant-prime mover net generation is also needed because there is EPA/CAMD non-zero reported emissions without associated EIA-923 net generation, then CAMD's reported annual gross load multiplied by a prime mover-level conversion factor found in Velocity Suite's data (Ventyx, 2007) for the specific unit(s) is used to estimate annual net generation MWh, aggregated to the plant level by prime mover. Similarly, for estimating EPA/CAMD ozone season net generation, CAMD's reported ozone season gross load multiplied by a prime mover-level conversion factor found in Velocity Suite's data (Ventyx, 2007) for the specific unit(s) is used to estimate ozone season net generation MWh, aggregated to the plant level by prime mover. Otherwise, if net generation for that prime mover is zero, then the associated adjusted emissions is assigned a value of zero.

Generation can be appropriately attributed to fuel type with the EIA-923 data. With the selected CAMD net generation, the fuel code of the plant primary fuel is assigned (see subsections C and D for further information about resource mix).

Combustion net generation is also developed (as is non-combustion generation), based on the fuel type generation of each plant. For plants that are only composed of combustion generating units, the plant combustion net generation is the same as the total plant net generation. For plants that have both combustion and non-combustion generating units, the combustion net generation will be less than the total net generation for that plant.

Generator level net generation

To determine generator level net generation for some units, use EIA-923 annual and ozone season net generation MWh for plants with one prime mover at a non-nuclear plant operating in year 2009. Additionally, for steam and nuclear generators, use EIA-923 nuclear unit-level reported annual and ozone season net generation. Most non-steam generators will not have a year 2009 value for net generation.

b. Heat Input

Heat input, in MMBtu, is the amount of heat energy consumed by a generating unit that combusts fuel. Annual boiler level heat input for eGRID is initially obtained from EPA/CAMD 12 month reported

emissions data. Ozone season heat input is also provided with these data. EPA heat input is based either on stack flow and CO_2/O_2 monitoring, or fuel flow and heat content of fuel.

If these EPA data are unavailable, heat input is obtained from the EIA-923 prime mover level data; its value was calculated internally by EIA by multiplying the reported EIA fuel consumption by the reported heat content (the higher heating value [HHV]). If available monthly data, the EIA ozone season heat input is calculated by summing up the data for the five months of May through September; otherwise, the ozone season heat input is calculated as 5/12 of the annual heat input.

If a plant reports heat input or data to calculate heat input for the same prime mover to EIA-923 and/or EPA/CAMD, the EPA/CAMD data are used first. If the sources are different for different components of the plant, then the heat input data are summed for the plant.

c. Rates

The units for output emission rates are lb/MWh for SO_2, NO_x, and CO_2, and lb/GWh for Hg, CH_4, and N_2O. These rates are calculated as the emissions divided by the net generation and multiplied by a unit conversion factor. Beginning with year 2009 data, for fuel-based output emissions rates, rather than divide the total adjusted emissions by the total plant net generation (as done for year 2007 data and earlier), if a plant is partially a combustion plant (i.e., it includes both combustion and non-combustion generators), then the total plant emissions are instead divided by the combustion net generation for that plant.

For input emission rates, the units are lb/MMBtu for SO_2, NO_x, and CO_2, and lb/BBtu for Hg; these rates are calculated as the emissions divided by the heat input and multiplied by a unit conversion factor.

eGRID output emission rates do not account for any line losses between the points of consumption and the points of generation. For example, because there are line losses, one kilowatt hour of electricity consumption requires a little more than one kilowatt hour of electricity generation. To account for transmission and distribution line losses when applying eGRID output emission rates to electricity consumption within a certain region, divide the consumption by (one minus the grid gross loss as a decimal). If reporting GHG emissions to The Climate Registry (TCR), the emissions without the line losses belong in scope 2, while just the emissions from line losses (the difference between the emissions including line losses and the emissions not including line losses) belong in scope 3. eGRID publishes grid gross loss factors, which can be used to account for line losses, in the eGRID Summary Tables.

Beginning with year 2009 data, grid gross loss is derived from FERC-714 power control area/balancing authority interchange data (as well as FERC generation, EIA consumption, U.S. regional interchange, and FERC foreign [Canadian and Mexican] net imports) that are summed to the defined region. The eGRID2012 year 2009 estimated grid gross loss for each U.S. interconnect power grid (EIA, 2000) (see Table III-8 for eGRID subregion – U.S. interconnect power grid relationships) are included in the eGRID2012 year 2009 workbook and are also displayed in Table III-4.

Table III-4. eGRID2012 Year 2009 Grid Gross Loss (%)

Power Grid	Grid Gross Loss (%)
Eastern	5.82
Western	8.21
ERCOT	7.99
Alaska	5.84
Hawaii	7.81
U.S.	**6.50**

i. Fuel-based Emission Rates

Beginning at the state level, coal, oil, gas, and fossil fuel output and input emission rates are calculated based on plants' fossil fuel category, which in turn is based on the plants' primary fuel (see subsection C). If a plant's primary fuel is in the coal, oil, gas, or other fossil category, then all of its adjusted emissions and heat input, and combustion net generation are included in the respective aggregation level for that fuel category. For example, all plants whose primary fuel is in the coal category and who are located in Alabama will have their emissions, heat input, and combustion net generation summed and then the appropriate calculations will be applied to determine the fuel-based output and input emission rates for Alabama. See Table III-5 for a list of primary fuels and fuel categories.

The methodology used to determine fuel-based output emissions rates has changed (see Section II B, What's New in eGRID2012).

ii. Non-baseload Emission Rates

Beginning at the state level, there are seven annual non-baseload emission rates which are the annual output emission rates for plants that combust fuel and have capacity factors less than 0.8, weighted by generation and a percent of generation determined by capacity factor. These data values are derived from plant level data and supplement, rather than replace, the fossil fuel output emission rates, which are sometimes used as a rough estimate to determine how much emissions could be avoided if energy efficiency and/or renewable energy displaces fossil fuel generation. These non-baseload output emission rates would somewhat improve this rough estimate by factoring out baseload generation, which is generally unaffected by measures that affect marginal generation.

The plant level capacity factor is used as a surrogate for determining how much non-baseload generation and emissions occur at each facility. Although there are reasons that can influence a particular plant's capacity factor besides dispatch or load order (e.g., repairs, etc.), capacity factor is being used as a surrogate for dispatch-order for this calculation. The non-baseload information is published in eGRID just at the aggregate level (state, PCA, etc.), but not for individual plants.

The following describes the procedure used to generate these non-baseload emission rates. The emission rates are determined starting with plant level data. First, all generation from resources that do not combust fuel is removed from each plant. Plants with 100% hydro, nuclear, wind, solar, and/or geothermal generation are removed from the non-baseload calculation. For any plants that have partial generation from the combustion of fuel, the emissions from the plant are retained and the generation from resources that do not combust fuel is subtracted out for this calculation, and the plant's output emission rate is recalculated. Next, a capacity factor relationship is used to determine the percent of the plant's generation and emissions to be considered non-baseload generation. All generation at plants with low capacity factors (greater than 0.0 and less than 0.2) would be considered non-baseload. No generation at plants with high capacity factors (0.8 and greater) would be considered non-baseload generation. No

generation at plants with negative generation from combustion sources would be considered non-baseload generation. A linear relationship would determine the percent generation that is non-baseload at plants with capacity factors between these 0.2 and 0.8. The non-baseload generation of each plant is multiplied by the plant's output emission rate, to determine the non-baseload emissions. Finally, the total non-baseload generation and the total non-baseload emissions are summed up at each level of aggregation (state, PCA, eGRID subregion, NERC region, and U.S. Total) and are used to calculate the non-baseload output emission rates.

eGRID non-baseload values can be useful when attempting to estimate the emissions benefits of reductions in electricity use. For example, if one is interested in estimating the carbon dioxide emission reductions associated with the installation of energy efficient equipment or products (e.g., an ENERGYSTAR heating, ventilating, and air conditioning (HVAC) system); or the installation of building envelop technologies (e.g., sealing air leaks and insulation improvements), then one could use the eGRID subregion non-baseload CO_2 output emission rate and the expected or actual energy savings resulting from the installation to estimate the CO_2 emission reductions. Non-baseload values may be less appropriate when attempting to determine the emissions benefits of some intermittent resources, such as wind power. Non-baseload values should not be used for assigning an emission value for electricity use in carbon-footprinting exercises or GHG emissions inventory efforts.

eGRID subregion total output emission rates are recommended for scope 2 emissions and the eGRID subregion non-baseload output emission rates are recommended to estimate emission reductions from renewable energy or energy efficiency projects that reduce consumption of grid supplied electricity.

The methodology used to determine non-baseload emissions rates has not changed.

iii. Combustion Emission Rates

Combustion output emission rates for all pollutants are estimated, beginning at the plant level. Whereas the generation used in the denominator for calculating the traditional total output emission rate is the total net generation, the denominator used for calculating the combustion output emission rate is the net generation associated with emissions, namely, the combustion generation only. Thus, generation from nuclear, hydro, geothermal, solar, and wind will not be included in the calculation of this rate. This methodology has not changed.

B. TREATMENT OF PLANT OWNERSHIP

Beginning with year 2009 data, the owner(s) and operator of a plant are taken directly from those provided in the 2009 EIA-860. Since ownership is reported in eGRID only on the plant level, but in the EIA-860 on the generator level, the generators' owner companies and percentages must be aggregated to the plant level, which is accomplished for each plant by MW-weighting each generator's ownership and then summing to the plant level. Although eGRID's methodology for assigning ownership on a plant level has not changed, eGRID has not tracked ownership or nonutility front company data as was done in the past, and is taking ownership data directly from the EIA-860 for year 2009 data.

Unfortunately, there are some plants for which this plant level ownership methodology will result in misleading percentages. For example, if one company owns only one of several generators and that one generator is connected to a "clean" boiler that has emissions whose ratio to the entire plant's emissions is much less than its MW's ratio to the entire plant's MW, that one company will, because of its MW-to-plant MW ratio, have a higher plant ownership percentage attributed to it than its actual emissions plant

percentage; thus, that company will be associated with greater emissions and generation than it actually has.

This situation is not typical since most plants do not have "jointly owned" generators or different owners for all the plant's generators. It affects only some plants and companies and some percentage of emissions and generation associations in this situation. One example that does not benefit from this methodology is Ohio's Cardinal plant (ORISPL = 2828), which has three generators and three boilers, associated on a one-to-one basis. Each generator has about the same nameplate capacity. One generator is owned by Ohio Power, and two by Buckeye Power Inc. The Cardinal plant ownership is approximately 33% Ohio Power and 67% Buckeye, so 67% of the plant emissions would be attributable to Buckeye Power using eGRID methodology. However, the reported SO_2 emissions for the two boilers associated with Buckeye's two generators combined are over 90% of the Cardinal plant's reported SO_2 emissions total (the largest boiler has no SO_2 control), and the reported NO_x emissions for the two boilers associated with Buckeye's two generators combined are over 70% of the Cardinal plant's reported NO_x emissions total (the largest boiler has an additional NO_x control [selective catalytic reduction]).

C. DETERMINATION OF PLANT PRIMARY FUEL

The primary fuel of a plant that consumes any amount of combustible fuel is determined solely by the fuel that has the maximum heat input for year 2009 data. This methodology has not changed.

For plants that do not consume any combustible fuel, the primary "fuel" is determined by the resource associated with the prime mover (nuclear, solar, wind, geothermal, or hydro/pumped storage) with the maximum generation associated with that prime mover.

The possible original fuel codes and fuel categories for the plant primary fuel data variable (PLPRMFL in the eGRID plant file) are as shown in Table III-5 below.

Table III-5. Plant Primary Fuel

Fuel Code	Description	Fuel Category	Fuel Group
AB	agricultural byproducts	biomass	solid
BG	bagasse	biomass	solid
BLQ	black liquor	biomass	solid
DG	digester gas	biomass	gas
LFG	landfill gas	biomass	gas
ME	methane	biomass	gas
MSB	MSW biomass part	biomass	solid
OBL	other biomass liquid	biomass	liquid
OBS	other biomass solids	biomass	solid
PP	paper pellets	biomass	solid
SLW	sludge waste	biomass	solid
WDL	wood (waste) liquids	biomass	liquid
WDS	wood (waste) solids	biomass	solid
ANT	anthracite coal	coal	solid
BIT	bituminous coal	coal	solid
LIG	lignite coal	coal	solid
SUB	subbituminous coal	coal	solid
SC	syncoal	coal	solid
RC	refined coal	coal	solid
WC	waste coal	coal	solid
SGC	coal-derived synthetic gas	coal	gas
NG	natural gas	gas	gas
PG	propane gas/LPG	gas	gas
BU	butane gas	gas	gas
DFO	distillate/diesel oil	oil	liquid
JF	jet fuel	oil	liquid
KER	kerosene	oil	liquid
OO	other oil	oil	liquid
OTL	other liquid	oil	liquid
PC	petroleum coke	oil	solid
RG	refinery gas	oil	gas
RFO	residual oil	oil	liquid
WO	waste oil	oil	liquid
BFG	blast furnace gas	other fossil	gas
COG	coke oven gas	other fossil	gas
HY	hydrogen	other fossil	gas
LB	liquid byproduct	other fossil	liquid
MH	methanol	other fossil	liquid
MSF	MSW other fossil part	other fossil	solid
OG	other gas	other fossil	gas
OTS	other solid	other fossil	solid
TDF	tire-derived fuel	other fossil	solid

Note that since solid waste plants are broken down into biomass and fossil components, a solid waste plant will have “MSB” as the primary fuel.

Since the plant primary fuel variable is based solely on heat input, a partially combustible fueled plant, i.e., one that burns some combustible fuel but is mainly a nuclear, hydro, or solar plant, the plant primary fuel designation can be misleading. Thus, a new variable, plant primary fuel generation category, was developed for the plant file, beginning with year 2007 data. This new variable is based on the maximum

net generation fuel category and can be one of eleven values (the same as the number of plant annual net generation fuel categories) as shown in Table III-6.

Table III-6. Plant Primary Fuel Generation Category

Fuel Category	Description
CL	Coal
OL	Oil
GS	Gas
NC	Nuclear
HY	Hydro
BM	Biomass
WI	Wind
SO	Solar
GT	Geothermal
OF	Other Fossil
OP	Other Unknown/Purchased/Waste Heat

D. ESTIMATION OF RESOURCE MIX

Resource mix is a collection of nonrenewable and renewable resources that are used to generate electricity. Nonrenewable resources include fossil fuels (e.g., coal, oil, gas, and other fossil) and nuclear energy source; renewable energy resources include biomass, solar, wind, geothermal, and hydro. A percentage is assigned to each resource or group of resources. Resource mix is displayed in eGRID and expressed in both MWh and generation percent.

For cases in which there is only one fuel and its generation is negative, that fuel's generation percent is assigned 100%. For cases in which there are fuels with both negative and positive net generation, the generation percents only include the positive generation in both the denominator and numerator. For cases in which there are only two fuels and both net generations are negative, both fuels' generation percents are assigned 0%.

For the three grouped aggregate categories – total net generation from nonrenewable, total net generation from all renewables, and total net generation from renewables minus hydro, the sum of the total net generation from renewables and from all nonrenewables equals the total net generation. In cases for which there is both positive and negative fuel generation in the nonrenewables category (it is unlikely to happen in the renewables category), the category percentages may be misleading since only the positive generation components are considered in calculating the generation percents for total renewables and nonrenewables. Similarly, for the two grouped aggregated categories of combustion net generation and noncombustion net generation, their sum equals the total net generation. For cases in which there is more than one negative nonrenewables (or combustion) net generation value and there is no renewables (or noncombustion) net generation, the total nonrenewables (or combustion) resource mix is assigned 100 %.

The methodology for the determination of resource mix has not changed.

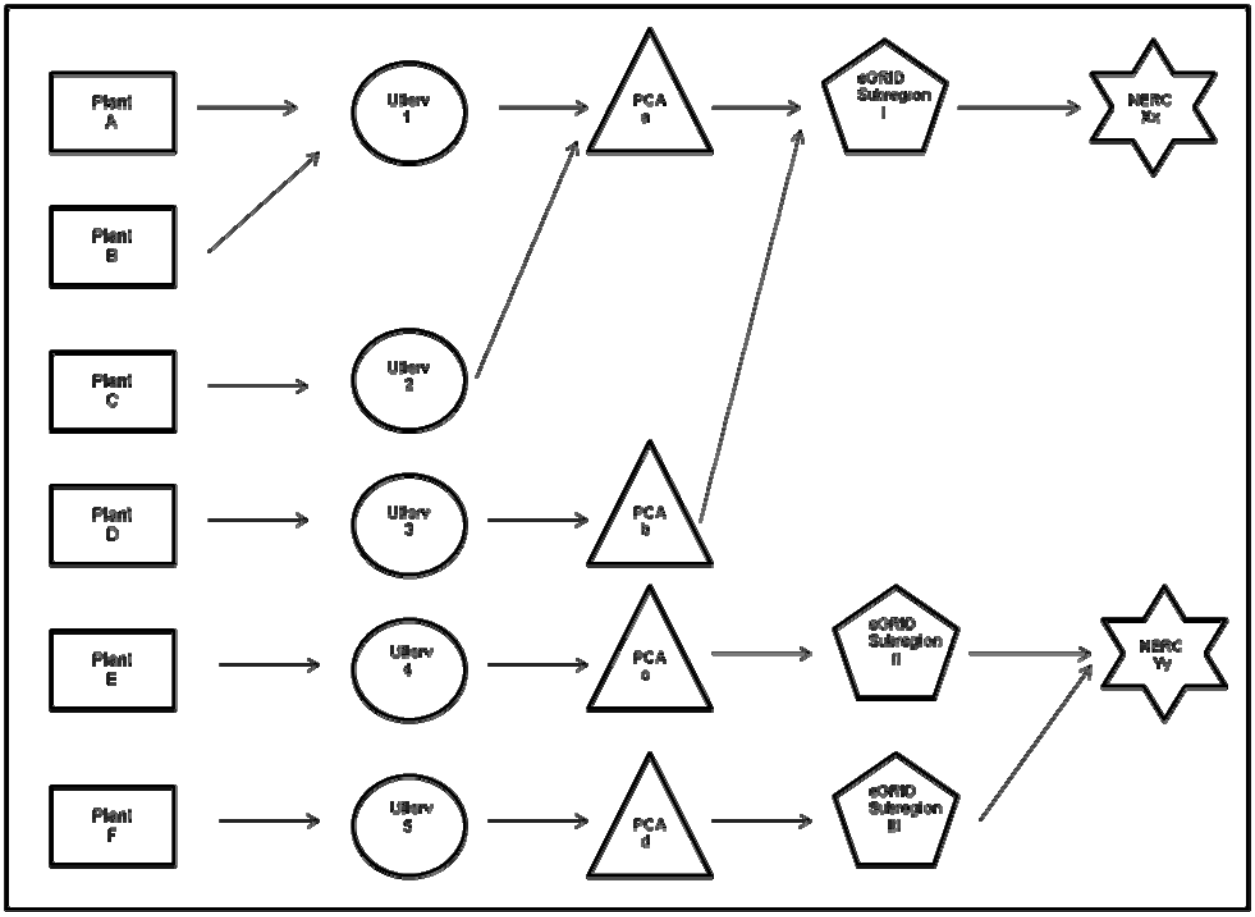
eGRID plant resource mix and net generation are derived from the EIA-923 prime mover level data, which provides the information on a plant-prime mover-fuel level. However, there are some cases for which only the EPA/CAMD-based net generation is available for use in eGRID. In these cases, the primary fuel (based on the maximum heat input value) is assigned 100% of the generation for the resource mix.

E. DETERMINATION OF PLANT AGGREGATION LINKS

The plant's state, operator, and owner(s), as well as the utility service territory EGCs (updated as needed) are already associated with each plant and based on EIA data.

A graphic representation of examples of relationships among plants, utility service territories, PCAs, eGRID subregions, and NERC regions is depicted below in Figure III-1.

Figure III-1. Examples of Plant Through NERC Linkages



1. NERC Region

NERC region refers to a region designated by the North American Electric Reliability Corporation. Each NERC region listed in eGRID represents one of ten regional portions of the North American electricity transmission grid: eight in the contiguous United States, plus Alaska and Hawaii (which are not part of the formal NERC regions, but are considered so in eGRID). The NERC regions themselves have not changed from those in eGRID2010; the Electric Reliability Council of Texas (ERCOT) NERC region did change its name to the Texas Reliability Entity (TRE) between eGRID years 2006 and 2007 data. Note, however, that some plants operating in each NERC region do change from year to year. The ten NERC region names and their acronyms for eGRID are displayed in Table III-7.

Table III-7. NERC Region Acronym and Names for eGRID

NERC Region	NERC Name
ASCC	Alaska Systems Coordinating Council
FRCC	Florida Reliability Coordinating Council
HICC	Hawaiian Islands Coordinating Council
MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RFC	Reliability First Corporation
SERC	SERC Reliability Corporation
SPP	Southwest Power Pool
TRE	Texas Regional Entity
WECC	Western Electricity Coordinating Council

Although some NERC regions include portions of Canada and/or Mexico that are integrated with U.S. grids, eGRID aggregation data are limited to generation within the United States.

A representation of the NERC region map used for eGRID2012 is included in Appendix B. This map, which is a *representational* one, shows approximate boundaries because they are based on companies, not on strictly geographical boundaries. Since NERC regions are based not on location but on companies, the linkage is between a plant and its transmission/distribution/utility service territory, which in turn is linked to a PCA, which is associated with a NERC region.

2. eGRID Subregion

eGRID subregions are developed as subsets of NERC regions. In eGRID2002 and earlier, these grid regions were similar to EPA's IPM subregions (except for the New York and California areas). Many of these older subregions no longer exist since their NERC regions no longer exist. At this juncture, NERC has only defined subregions for the WECC NERC region. Thus, for the WECC NERC region and for those other NERC regions that did not change configuration, the newer eGRID subregions will remain in effect. Definitions of the eGRID subregions were made by EPA after consultation with NERC staff.

A representation of the eGRID subregion map used for eGRID2012 is included in Appendix B. This map, which is a *representational* one, shows approximate boundaries because they are based on companies, not on strictly geographical boundaries. Since plant-associated eGRID subregions are based on companies, the linkage is between a plant and its transmission/distribution/utility service territory, not the plant location. Thus, there is no shape file or subregion layer available for eGRID subregions.

eGRID subregions are identified and defined by EPA – using the NERC regions and PCAs as a guide. An eGRID subregion is often, but not always, equivalent to an Integrated Planning Model (IPM) subregion. The 26 eGRID subregions are subsets of the NERC regions as configured on December 2010. The plant's associated PCA determines the plant's associated eGRID subregion, which is defined as a subset of the NERC region, and is composed of entire PCAs – with the exception of PJM Interconnection and New York Independent System Operator PCAs, which are each associated with three eGRID subregions. The eGRID subregions themselves have not changed since eGRID2002 year 2000 data. Note, however, that some plants operating in each eGRID subregion do change from year to year. The 26 eGRID subregion names and their acronyms are displayed in Table III-8, along with the U.S interconnect power grid that they are part of. Note that the five eGRID subregions within the SERC NERC region are also known by other names; specifically, SERC Midwest is also called Gateway, SERC Mississippi Valley is also called Delta, SERC Tennessee Valley is also called Central, SERC South is also called Southeastern, and SERC Virginia/Carolina is also called VACAR.

Table III-8. eGRID Subregion Acronym and Names for eGRID

eGRID Subregion	eGRID Subregion Name	Power Grid
FRCC	FRCC All	Eastern
MROE	MRO East	Eastern
MROW	MRO West	Eastern
NEWE	NPCC New England	Eastern
NYCW	NPCC NYC/Westchester	Eastern
NYLI	NPCC Long Island	Eastern
NYUP	NPCC Upstate NY	Eastern
RFCE	RFC East	Eastern
RFCM	RFC Michigan	Eastern
RFCW	RFC West	Eastern
SRMW	SERC Midwest	Eastern
SRMV	SERC Mississippi Valley	Eastern
SRSO	SERC South	Eastern
SRTV	SERC Tennessee Valley	Eastern
SRVC	SERC Virginia/Carolina	Eastern
SPNO	SPP North	Eastern
SPSO	SPP South	Eastern
CAMX	WECC California	Western
NWPP	WECC Northwest	Western
RMPA	WECC Rockies	Western
AZNM	WECC Southwest	Western
ERCT	ERCOT All	ERCOT
AKGD	ASCC Alaska Grid	Alaska
AKMS	ASCC Miscellaneous	Alaska
HIOA	HICC Oahu	Hawaii
HIMS	HICC Miscellaneous	Hawaii

3. Power Control Area

A Power Control Area (PCA) (or Balancing Authority, as NERC now terms it) is a portion of an integrated power grid for which a single dispatcher has operational control of all electric generators. PCAs range in size from small municipal utilities such as Columbia MO City of, to large power pools such as PJM Interconnection. There have been some changes to PCAs from eGRID2010 to eGRID2012 (NERC, 2012a).

In Alaska, isolated electric utility systems, which are not part of an integrated power grid, have been grouped into a nominal PCA called “Alaska Misc.” In Hawaii, isolated electric utility systems, which are not part of an integrated power grid, have been grouped into a nominal PCA called “Hawaii Misc.” These two PCAs have dummy (negative) codes since there are none available from EIA: -1 for Alaska Misc and -2 for Hawaii Misc. Otherwise, PCA IDs are assigned based on the EIA-861 (EIA, 2011b) if possible; if the name is essentially the same as an EGC’s, then the EIA EGC code from the EIA-860 is used (EIA, 2011a).

In eGRID, a PCA associated with a plant is determined by the transmission lines connecting the PCA and the plant through a utility entity (previously thought of/known as a utility service area) and now reported to EIA as “the owner of the transmission or distribution facilities to which the plant is interconnected” (EIA, 2011a) and that eGRID terms a utility service territory.

PCAs are assigned according to the utility service territory in which the plant is physically located. The PCA associated with a plant is determined by the owner of the transmission/distribution utility/regulated EGC (not parent company) associated with the plant. At present, there is not one Federal file that can be used to link year 2009 utility EGCs with their PCAs, but the PCAs in eGRID have been updated and reported by NERC to reflect a March 2012 configuration (NERC, 2012a).

The PCA link to the NERC region has been determined by NERC, as has the PCA association with the Midwest Independent Transmission System Operator (MISO) for 26 PCAs. The plant's associated PCA determines the plant's associated NERC region, except for the PJM Interconnection PCA, which has plants in two NERC regions. NERC provides the linkage used in eGRID between PCAs and NERC regions by publishing the currently registered balancing authorities (PCAs) in the NERC Compliance Registry (NERC, 2012a). The NERC acronyms are also assigned by NERC. The possible relationships between the 129 PCAs (119 PCAs are displayed in eGRID2012 year 2009 data) and 10 NERC regions are shown below in Table III-9.

Table III-9. PCA – NERC Region Relationship

PCA Name	NERC Region	NERC Name
Alaska Misc	ASCC	Alaska Systems Coordinating Council
Anchorage Municipality of	ASCC	Alaska Systems Coordinating Council
Chugach Electric Assn Inc	ASCC	Alaska Systems Coordinating Council
Golden Valley Elec Assn Inc	ASCC	Alaska Systems Coordinating Council
Florida Municipal Power Pool	FRCC	Florida Reliability Coordinating Council
Florida Power & Light Company	FRCC	Florida Reliability Coordinating Council
Gainesville Regional Utilities	FRCC	Florida Reliability Coordinating Council
Homestead City of	FRCC	Florida Reliability Coordinating Council
JEA	FRCC	Florida Reliability Coordinating Council
New Smyrna Beach Utilities Commission of	FRCC	Florida Reliability Coordinating Council
Progress Energy Florida	FRCC	Florida Reliability Coordinating Council
Seminole Electric Cooperative	FRCC	Florida Reliability Coordinating Council
Tallahassee City of	FRCC	Florida Reliability Coordinating Council
Tampa Electric Company	FRCC	Florida Reliability Coordinating Council
Hawaii Electric Light Co Inc	HICC	Hawaiian Islands Coordinating Council
Hawaii Misc	HICC	Hawaiian Islands Coordinating Council
Hawaiian Electric Co Inc	HICC	Hawaiian Islands Coordinating Council
Alliant - East	MRO	Midwest Reliability Organization
Alliant - West	MRO	Midwest Reliability Organization
Dairyland Power Cooperative	MRO	Midwest Reliability Organization
Great River Energy	MRO	Midwest Reliability Organization
Lincoln Electric System	MRO	Midwest Reliability Organization
Madison Gas and Electric Company	MRO	Midwest Reliability Organization
MidAmerican Energy Company	MRO	Midwest Reliability Organization
Minnesota Power	MRO	Midwest Reliability Organization
Muscatine Power and Water	MRO	Midwest Reliability Organization
Nebraska Public Power District	MRO	Midwest Reliability Organization
Northern States Power	MRO	Midwest Reliability Organization
Omaha Public Power District	MRO	Midwest Reliability Organization
Otter Tail Power Company	MRO	Midwest Reliability Organization
Southern Minnesota Municipal Power Agcy	MRO	Midwest Reliability Organization
Upper Peninsula Power Company	MRO	Midwest Reliability Organization

Table III-9 (continued).

PCA Name	NERC Region	NERC Name
WAPA - Upper Great Plains East	MRO	Midwest Reliability Organization
Wisconsin Public Service Corporation	MRO	Midwest Reliability Organization
New Brunswick System Operator	NPCC	Northeast Power Coordinating Council
New England ISO	NPCC	Northeast Power Coordinating Council
New York ISO	NPCC	Northeast Power Coordinating Council
Consumers Energy Company	RFC	Reliability First Corporation
Detroit Edison Company	RFC	Reliability First Corporation
Duke Energy Corporation	RFC	Reliability First Corporation
Hoosier Energy REC	RFC	Reliability First Corporation
Indianapolis Power & Light Company	RFC	Reliability First Corporation
Michigan Electric Coordinated Systems	RFC	Reliability First Corporation
Northern Indiana Public Service Company	RFC	Reliability First Corporation
Ohio Valley Electric Corporation	RFC	Reliability First Corporation
PJM Interconnection	RFC, SERC	Reliability First Corporation, SERC Reliability Corporation
Southern Indiana Gas & Electric Company	RFC	Reliability First Corporation
Wisconsin Energy Corporation	RFC	Reliability First Corporation
Alcoa Power - Yadkin Division	SERC	SERC Reliability Corporation
Ameren Services Company	SERC	SERC Reliability Corporation
Associated Electric Cooperative Inc	SERC	SERC Reliability Corporation
Benton City of	SERC	SERC Reliability Corporation
Big Rivers Electric Corporation	SERC	SERC Reliability Corporation
CECD - Batesville	SERC	SERC Reliability Corporation
Columbia MO City of	SERC	SERC Reliability Corporation
Conway City of	SERC	SERC Reliability Corporation
Duke Energy Carolinas	SERC	SERC Reliability Corporation
East Kentucky Power Cooperative	SERC	SERC Reliability Corporation
Electric Energy Inc	SERC	SERC Reliability Corporation
Entergy	SERC	SERC Reliability Corporation
LG&E and KU Services Company	SERC	SERC Reliability Corporation
Louisiana Generating	SERC	SERC Reliability Corporation
North Little Rock AR City of	SERC	SERC Reliability Corporation
Osceola AR City of	SERC	SERC Reliability Corporation
Plum Point Energy Associates	SERC	SERC Reliability Corporation
PowerSouth Energy Cooperative	SERC	SERC Reliability Corporation
Progress Energy Carolinas	SERC	SERC Reliability Corporation
Ruston LA City of	SERC	SERC Reliability Corporation
South Carolina Electric & Gas Company	SERC	SERC Reliability Corporation
South Carolina Public Service Authority	SERC	SERC Reliability Corporation
South Mississippi Electric Power Assn	SERC	SERC Reliability Corporation
Southeastern Power Administration	SERC	SERC Reliability Corporation
Southern Company Services	SERC	SERC Reliability Corporation
Southern Illinois Power Cooperative	SERC	SERC Reliability Corporation
Springfield IL - CWLP City of	SERC	SERC Reliability Corporation
Tennessee Valley Authority	SERC	SERC Reliability Corporation
Union Power Partners	SERC	SERC Reliability Corporation
West Memphis AR City of	SERC	SERC Reliability Corporation
AEP - PSO/SWEPCO	SPP	Southwest Power Pool
Cleco Corporation	SPP	Southwest Power Pool
Empire District Electric Company	SPP	Southwest Power Pool

Table III-9 (continued).

PCA Name	NERC Region	NERC Name
Grand River Dam Authority	SPP	Southwest Power Pool
Independence MO City of	SPP	Southwest Power Pool
Kansas City Board of Public Utilities	SPP	Southwest Power Pool
Kansas City Power & Light Co-GMO	SPP	Southwest Power Pool
Kansas City Power & Light Company	SPP	Southwest Power Pool
Lafayette Utilities System	SPP	Southwest Power Pool
Louisiana Energy & Power Authority	SPP	Southwest Power Pool
Oklahoma Gas and Electric Company	SPP	Southwest Power Pool
Southwestern Power Administration	SPP	Southwest Power Pool
Southwestern Public Service Company	SPP	Southwest Power Pool
Springfield MO City Utilities of	SPP	Southwest Power Pool
Sunflower Electric Power Corporation	SPP	Southwest Power Pool
Westar Energy	SPP	Southwest Power Pool
Western Farmers Electric Cooperative	SPP	Southwest Power Pool
ERCOT ISO	TRE	Texas Regional Entity
Arizona Public Service Company	WECC	Western Electricity Coordinating Council
Arlington Valley	WECC	Western Electricity Coordinating Council
Avista Corporation	WECC	Western Electricity Coordinating Council
Balancing Authority of Northern California	WECC	Western Electricity Coordinating Council
Bonneville Power Administration	WECC	Western Electricity Coordinating Council
California ISO	WECC	Western Electricity Coordinating Council
El Paso Electric Company	WECC	Western Electricity Coordinating Council
Gila River Power	WECC	Western Electricity Coordinating Council
Griffith Energy	WECC	Western Electricity Coordinating Council
Idaho Power Company	WECC	Western Electricity Coordinating Council
Imperial Irrigation District	WECC	Western Electricity Coordinating Council
Los Angeles Department of Water and Power	WECC	Western Electricity Coordinating Council
NaturEner Power Watch	WECC	Western Electricity Coordinating Council
Nevada Power Company	WECC	Western Electricity Coordinating Council
New Harquahala Generating Company	WECC	Western Electricity Coordinating Council
NorthWestern Corporation	WECC	Western Electricity Coordinating Council
PUD No. 1 of Chelan County	WECC	Western Electricity Coordinating Council
PUD No. 1 of Douglas County	WECC	Western Electricity Coordinating Council
PUD No. 2 of Grant County	WECC	Western Electricity Coordinating Council
PacifiCorp	WECC	Western Electricity Coordinating Council
Portland General Electric Company	WECC	Western Electricity Coordinating Council
Public Service Company of Colorado	WECC	Western Electricity Coordinating Council
Public Service Company of New Mexico	WECC	Western Electricity Coordinating Council
Puget Sound Energy	WECC	Western Electricity Coordinating Council
Salt River Project	WECC	Western Electricity Coordinating Council
Seattle City Light	WECC	Western Electricity Coordinating Council
Sierra Pacific Power Company	WECC	Western Electricity Coordinating Council
Tacoma Power	WECC	Western Electricity Coordinating Council
Tucson Electric Power	WECC	Western Electricity Coordinating Council
Turlock Irrigation District	WECC	Western Electricity Coordinating Council
WAPA - Desert Southwest Region	WECC	Western Electricity Coordinating Council
WAPA - Rocky Mountain Region	WECC	Western Electricity Coordinating Council
WAPA - Upper Great Plains West	WECC	Western Electricity Coordinating Council

The 2009 EIA-860 (EIA, 2011a) specifies each plant's owner of the transmission/distribution utility/regulated EGC (also called utility service territory), but there appear to be many that are incorrect. TS|Pechan has used a WECC document, "Existing Generation and Significant Additions and Changes to System Facilities Data as of January 1, 2007" (WECC, 2007) and independent research to provide PCAs and eGRID subregions (then the WECC plants' utility service territories were updated as needed). The other nine NERC regions' utility service territories were also reviewed and updated as needed, as were the PCAs, eGRID subregions, and NERC regions.

Since PCAs are not strictly geographically based, there are no shape files available for mapping them. Several years ago, the NERC website, www.nerc.com, had a PCA "bubble map" available to show the relationship between the PCAs and their approximate relationship to NERC regions, but it was simply an approximation. A recent PCA bubble map does not seem to be available from NERC

The relationship among PCAs, eGRID subregions, and NERC regions, as well as the PCA-MISO association is depicted in Table III-10 below.

Table III-10. PCA – MISO – eGRID Subregion – NERC Region Relationship

PCA Name	MISO?	eGRID Subregion	NERC Region
AEP - PSO/SWEPCO		SPSO	SPP
Alaska Misc		AKMS	ASCC
Alcoa Power - Yadkin Division		SRVC	SERC
Alliant - East	Y	MROE	MRO
Alliant - West	Y	MROW	MRO
Ameren Services Company	Y	SRMW	SERC
Anchorage Municipality of		AKGD	ASCC
Arizona Public Service Company		AZNM	WECC
Arlington Valley		AZNM	WECC
Associated Electric Cooperative Inc		SRTV	SERC
Avista Corporation		NWPP	WECC
Balancing Authority of Northern California		CAMX	WECC
Benton City of		SRMV	SERC
Big Rivers Electric Corporation	Y	SRTV	SERC
Bonneville Power Administration		NWPP	WECC
CECD - Batesville		SRMV	SERC
California ISO		CAMX	WECC
Chugach Electric Assn Inc		AKGD	ASCC
Cleco Corporation		SPSO	SPP
Columbia MO City of	Y	SRMW	SERC
Consumers Energy Company	Y	RFCM	RFC
Conway City of		SRMV	SERC
Dairyland Power Cooperative	Y	MROW	MRO
Detroit Edison Company	Y	RFCM	RFC
Duke Energy Carolinas		SRVC	SERC
Duke Energy Corporation		RFCW	RFC
ERCOT ISO		ERCT	TRE
East Kentucky Power Cooperative		SRTV	SERC
El Paso Electric Company		AZNM	WECC
Electric Energy Inc		SRTV	SERC
Empire District Electric Company		SPNO	SPP
Entergy		SRMV	SERC

Table III-10 (continued).

PCA Name	MISO?	eGRID Subregion	NERC Region
Florida Municipal Power Pool		FRCC	FRCC
Florida Power & Light Company		FRCC	FRCC
Gainesville Regional Utilities		FRCC	FRCC
Gila River Power		AZNM	WECC
Golden Valley Elec Assn Inc		AKGD	ASCC
Grand River Dam Authority		SPSO	SPP
Great River Energy	Y	MROW	MRO
Griffith Energy		AZNM	WECC
Hawaii Electric Light Co Inc		HIMS	HICC
Hawaii Misc		HIMS	HICC
Hawaiian Electric Co Inc		HIOA	HICC
Homestead City of		FRCC	FRCC
Hoosier Energy REC	Y	RFCW	RFC
Idaho Power Company		NWPP	WECC
Imperial Irrigation District		AZNM	WECC
Independence MO City of		SPNO	SPP
Indianapolis Power & Light Company	Y	RFCW	RFC
JEA		FRCC	FRCC
Kansas City Board of Public Utilities		SPNO	SPP
Kansas City Power & Light Co-GMO		SPNO	SPP
Kansas City Power & Light Company		SPNO	SPP
LG&E and KU Services Company		SRTV	SERC
Lafayette Utilities System		SPSO	SPP
Lincoln Electric System		MROW	MRO
Los Angeles Department of Water and Power		CAMX	WECC
Louisiana Energy & Power Authority		SPSO	SPP
Louisiana Generating		SRMV	SERC
Madison Gas and Electric Company	Y	MROE	MRO
Michigan Electric Coordinated Systems	Y	RFCM	RFC
MidAmerican Energy Company	Y	MROW	MRO
Minnesota Power	Y	MROW	MRO
Muscatine Power and Water	Y	MROW	MRO
NaturEner Power Watch		NWPP	WECC
Nebraska Public Power District		MROW	MRO
Nevada Power Company		AZNM	WECC
New Brunswick System Operator		NEWE	NPCC
New England ISO		NEWE	NPCC
New Harquahala Generating Company		AZNM	WECC
New Smyrna Beach Utilities Commission of		FRCC	FRCC
New York ISO		NYCW	NPCC
New York ISO		NYLI	NPCC
New York ISO		NYUP	NPCC
North Little Rock AR City of		SRMV	SERC
NorthWestern Corporation		NWPP	WECC
Northern Indiana Public Service Company	Y	RFCW	RFC
Northern States Power	Y	MROW	MRO
Ohio Valley Electric Corporation		RFCW	RFC
Oklahoma Gas and Electric Company		SPSO	SPP
Omaha Public Power District		MROW	MRO

Table III-10 (continued).

PCA Name	MISO?	eGRID Subregion	NERC Region
Osceola AR City of		SRMV	SERC
Otter Tail Power Company	Y	MROW	MRO
PJM Interconnection		RFCE	RFC
PJM Interconnection		RFCW	RFC
PJM Interconnection		SRVC	SERC
PUD No. 1 of Chelan County		NWPP	WECC
PUD No. 1 of Douglas County		NWPP	WECC
PUD No. 2 of Grant County		NWPP	WECC
PacifiCorp		NWPP	WECC
Plum Point Energy Associates		SRMV	SERC
Portland General Electric Company		NWPP	WECC
PowerSouth Energy Cooperative		SRSO	SERC
Progress Energy Carolinas		SRVC	SERC
Progress Energy Florida		FRCC	FRCC
Public Service Company of Colorado		RMPA	WECC
Public Service Company of New Mexico		AZNM	WECC
Puget Sound Energy		NWPP	WECC
Ruston LA City of		SRMV	SERC
Salt River Project		AZNM	WECC
Seattle City Light		NWPP	WECC
Seminole Electric Cooperative		FRCC	FRCC
Sierra Pacific Power Company		NWPP	WECC
South Carolina Electric & Gas Company		SRVC	SERC
South Carolina Public Service Authority		SRVC	SERC
South Mississippi Electric Power Assn		SRSO	SERC
Southeastern Power Administration		SRVC	SERC
Southern Company Services		SRSO	SERC
Southern Illinois Power Cooperative	Y	SRMW	SERC
Southern Indiana Gas & Electric Company	Y	RFCW	RFC
Southern Minnesota Municipal Power Agcy	Y	MROW	MRO
Southwestern Power Administration		SPSO	SPP
Southwestern Public Service Company		SPSO	SPP
Springfield IL - CWLP City of	Y	SRMW	SERC
Springfield MO City Utilities of		SPSO	SPP
Sunflower Electric Power Corporation		SPNO	SPP
Tacoma Power		NWPP	WECC
Tallahassee City of		FRCC	FRCC
Tampa Electric Company		FRCC	FRCC
Tennessee Valley Authority		SRTV	SERC
Tucson Electric Power		AZNM	WECC
Turlock Irrigation District		CAMX	WECC
Union Power Partners		SRMV	SERC
Upper Peninsula Power Company	Y	MROE	MRO
WAPA - Desert Southwest Region		AZNM	WECC
WAPA - Rocky Mountain Region		RMPA	WECC
WAPA - Upper Great Plains East		MROW	MRO
WAPA - Upper Great Plains West		NWPP	WECC
West Memphis AR City of		SRMV	SERC
Westar Energy		SPNO	SPP

Table III-10 (continued).

PCA Name	MISO?	eGRID Subregion	NERC Region
Western Farmers Electric Cooperative		SPSO	SPP
Wisconsin Energy Corporation	Y	RFCW	RFC
Wisconsin Public Service Corporation	Y	MROE	MRO

F. TREATMENT OF AGGREGATION LEVELS

All aggregation levels are based on the plant file. The state file data are developed by summing up the plant data (adjusted heat input, adjusted emissions, adjusted fuel-based emissions, net generation, fuel-based net generation, nameplate capacity, and the plant data values needed to calculate non-baseload emission rates), based on the state in which the plant is located. The PCA, eGRID subregion, and NERC region files are developed by summing up the plant data for each of the values for each aggregation level. This methodology has not changed.

The totals from the plant, state, PCA, eGRID subregion, NERC region, and U.S. files' adjusted heat input, adjusted emissions, adjusted fuel-based emissions, net generation, fuel-based net generation, and nameplate capacity data should be the same, after accounting for rounding.

SECTION IV. SPECIFIC eGRID IDENTIFIER CODES, NAME CHANGES AND ASSOCIATIONS

eGRID2012 generally uses identifier (ID) codes (for plants, companies, etc.) assigned by EIA. However, identifiers (IDs) and certain corresponding names have been changed in eGRID2012 in order to minimize confusion. If needed, entities that do not have an EIA designated ID are assigned values in eGRID. The specifics are delineated below.

A. PLANT LEVEL

One plant, Laramie River Station (ORISPL = 6204) in Wyoming, has three boilers and generators that supply power to two different power grids. Consequently, the first boiler (1) has become a separate plant in eGRID2012 with a dummy ORISPL = 6204.1 because it is operated within a PCA that is in the Eastern grid; while the second and third boilers have become a separate plant with a dummy ORISPL = 6204.2 because they are operated within a PCA that is in the Western grid. This plant representation occurs in all editions of eGRID.

B. EGC, COMPANY LEVEL

EGCs, for purposes of eGRID files, are operators, owners, and utility service territories of power plants for the given year. Each EGC has a unique code assigned by EIA.

Several other companies, as utility service territories, were broken up and given dummy IDs because the company operates in more than one power control area or do not have an EIA company code in any published EIA electric power survey data. These include:

- Basin Electric Power Coop EGC (ID = -7304), which is broken up into two divisions: Basin Electric Power Coop-East EGC (ID = 1307.1) and Basin Electric Power Coop-West EGC (ID = 1307.2);
- PacifiCorp EGC (ID = 14354), which is broken up into two divisions: PacifiCorp-Rocky Mtn EGC (ID = 14354.1) and PacifiCorp-Pacific EGC (ID = 14354.2); and
- Liberty Utilities (ID = 66666).

[This page intentionally left blank.]

SECTION V. DESCRIPTION OF DATA ELEMENTS

For year 2009 data, eGRID2012 has 8 aggregation files named BLR (boiler), GEN (generator), PLNT (plant), ST (state), PCAL (PCA), SRL (eGRID subregion), NRL (NERC region), and US (United States total). The regional grid gross loss factor data are also included. Appendix A provides the file structure for the eGRID2012 2007 data year, which include variable descriptions and original data sources. Definitions for like variables are not repeated after the description in the plant file. For example, in the plant file, the net generation in MWh is defined at the plant level for the data element PLNGENAN. For each subsequent file, the net generation, nnNGENAN (where nn is ST, PC, SR, NR, or US) is not described in Appendix A; it is simply the sum of PLNGENAN attributed to the aggregation entity.

A. THE BLR (BOILER) FILE

There are 34 variables in the first file, BLR, which contains unit level data. The one new variable for this data year is the first one. The one replacement variable (previously NBPFLAG) is PRGCODE, which displays all – not just one -- of the EPA programs to which the unit is subjected. Note that summing the boiler unadjusted emissions to the plant level may not result in the same values as the plant unadjusted emissions since additional emissions from prime movers not covered by the EPA/CAMD boiler level data may be included in the plant emissions values.

1. **eGRID2012 year 2009 File Boiler Sequence Number (SEQBLR09) –**
   The boiler records in this year 2009 data file are sorted by state postal code abbreviation, plant name, plant code, and boiler ID, and are assigned a unique sequential number beginning with 1. This sequence number is unlikely to be the same as the sequence number in the year 2007 eGRID file for the same entity.
   This is a new field in eGRID2012.

2. **Plant State Abbreviation (PSTATABB) –**
   This field contains the two character postal code abbreviation of the state in which the plant is located.
   Source: EIA-860

3. **Plant Name (PNAME) –**
   This field is the name associated with each plant.
   Source: EIA-860 + updates

4. **DOE/EIA ORIS Plant or Facility Code (ORISPL) –**
   This plant code corresponds to PNAME and was originally developed for power plants by the Office of the Regulatory Information System (ORIS), which was a part of the Federal Power Commission. It is now assigned by EIA and is used as a unique plant identification code for many EPA electric power databases, too. One plant code, that for Laramie River, has been altered. See Section IV for details.
   Source: EIA-860 + updates

5. **Boiler ID (BLRID) –**
   This field identifies the unit ID for the unit that produces the emissions. The unit may be a steam boiler, combustion turbine, or engine.
   Sources: EPA/CAMD, EIA-923

6. Acid Rain Program Flag (ARPFLAG) –

This field indicates if the unit reports EPA/CAMD emissions data annually under Title IV of the Clean Air Act Amendments of 1990 as part of the Acid Rain Program (1=Yes).
Source: EPA/CAMD

7. Program Codes (PRGCODE) –

This field lists, as reported to EPA/CAMD, the programs that the unit is subject to. Values may be combined and separated by commas. The individual values possible are:

ARP	=Acid Rain Program
CAIRNOX	=Clean Air Interstate Rule for NO_x (annual)
CAIROS	=Clean Air Interstate Rule for NO_x (ozone season)
CAIRSO2	=Clean Air Interstate Rule for SO_2
NHNOX	=New Hampshire's special NO_x program
RGGI	=Regional Greenhouse Gas Initiative (CO_2)
SIPNOX	=NO_x SIP Call

See http://epa.gov/airmarkets/progsregs/index.html#current for additional information.

This field, beginning with year 2009 data, replaces the more limiting field, NBPFLAG, from earlier eGRID data years.
Source: EPA/CAMD

8. Boiler Bottom and Firing Type (BOTFIRTY) –

This field displays the boiler bottom type followed by the firing type. This field is based on the "best" data source display in field #24.
Possible values are:

For bottom type:

	= Blank
DRY	= Dry bottom
WET	= Wet bottom

For firing type:

	= Blank
ARCH	= Arch firing
CELL	= Cell
CONCEN/TANG	= Concentric (tangentially-fired)
CYCLONE	= Cyclone firing
DUCTBURNER	= Duct burner
FLUIDIZED	= Fluidized bed firing
FRONT/WALL	= Front firing (wall-fired)
N/A	= Not available
OPPOS/WALL	= Opposite firing (wall-fired)
OTHER	= Other
REAR/WALL	= Rear firing (wall-fired0
SIDE/WALL	= Side firing (wall-fired)
STOKER	= Stoker (spreader)
TANGENTIAL	= Tangential firing
TURBO	= Turbo
VERTICAL	= Vertical firing
WALL	= Wall firing

Source: EPA/CAMD, EIA-860

9. Number of Associated Generators (NUMGEN) –

This field provides the number of generators associated with each EIA-860 boiler in the file.

Source: EIA-860

10. Boiler Primary Fuel (FUELB1) –

This field specifies the primary fuel determined from EIA-923 boiler reported data or the primary fuel reported to EPA/CAMD. This field is based on the "best" data source display in field #24.

Possible values are:

AB = Agricultural byproduct
BFG = Blast furnace gas
BG = Butane gas
BIT = Bituminous coal
BLQ = Black liquor
COG = Coke oven gas
DFO = Distillate fuel oil, light fuel oil, FO2, diesel oil
DG = Digester gas (other biomass gas)
HY = Hydrogen
JF = Jet fuel
KER = Kerosene
LFG = Landfill gas
LIG = Lignite coal
MSB = Municipal solid waste biomass component
NG = Natural gas
OBS = Other biomass solid
OG = Other gas
OO = Other oil
OTH = Other
PC = Petroleum coke
PRG = Process gas
RFO = Residual fuel oil, heavy fuel oil, petroleum
RG = Refinery gas
SC = Synthetic coal (syncoal)
SLW = Sludge waste
SUB = Subbituminous coal
TDF = Tire-derived fuel
WC = Waste coal
WDL = Wood, wood waste liquid
WDS = Wood, wood waste solid
WO = Waste oil

Source: EPA/CAMD, EIA-923

11. Unit Operating Hours (HRSOP) –

This field is the number of hours that an EPA/CAMD unit reported operating during the year.

Source: EPA/CAMD

12. **Boiler Unadjusted Annual EPA/CAMD Heat Input (HTIEAN) –**
This field, in MMBtu, is the unit's unadjusted annual total heat input assigned by EPA/CAMD, based on the values reported to EPA/CAMD. When not available, it is zero.
Source: EPA/CAMD

13. **Boiler Unadjusted Ozone Season EPA/CAMD Heat Input (HTIEOZ) –**
This field, in MMBtu, is the unit's unadjusted ozone season (May through September) heat input, based on the values reported to EPA/CAMD. When not available, it is zero.
Source: EPA/CAMD

14. **Boiler Unadjusted Annual Total EIA-Based Calculated Heat Input (HTIFAN) –**
This field, in MMBtu, provides the boiler's unadjusted annual total heat input, calculated using EIA-923 boiler data, when available. When not available, it is zero.
Source: EIA-923

15. **Boiler Unadjusted Ozone Season EIA-Based Calculated Heat Input (HTIFOZ) –**
This field, in MMBtu, provides the boiler's unadjusted ozone season (May through September) heat input, calculated using EIA-923 boiler data, when available. If EIA-923 boiler ozone season data are not available, but EIA-923 boiler annual data are, then the value in this field is calculated as 5/12 of the annual value. Otherwise, the value is zero.
Source: EIA-923

16. **Boiler Unadjusted Annual EPA/CAMD NO_x Emissions (NOXEAN) –**
This field, in tons, is the unit's unadjusted NO_x emissions assigned by EPA/CAMD based on the values reported to EPA/CAMD. When not available, it is zero.
Source: EPA/CAMD

17. **Boiler Unadjusted Ozone Season EPA/CAMD NO_x Emissions (NOXEOZ) –**
This field, in tons, is the unit's unadjusted ozone season (May through September) NO_x emissions based on values reported to EPA/CAMD. When not available, it is zero.
Source: EPA/CAMD

18. **Boiler Unadjusted Annual EIA-Based Calculated NO_x Emissions (NOXFAN) –**
This field, in tons, is the boiler's unadjusted annual NO_x emissions calculated using EIA-923 boiler reported data, when available, and the EPA-approved EF. When not available, it is zero.
Source: EIA-923

19. **Boiler Unadjusted Ozone Season EIA-Based Calculated NO_x Emissions (NOXFOZ) –**
This field, in tons, is the boiler's unadjusted ozone season (May through September) NO_x emissions calculated from EIA-923 boiler reported data and EPA-approved EF. If EIA-923 boiler ozone season data are not available, but EIA-923 annual data are, then the value in this field is calculated as 5/12 of the annual value. Otherwise, the value is zero.
Source: EIA-923

20. **Boiler Unadjusted Annual EPA/CAMD SO_2 Emissions (SO2EAN) –**
This field, in tons, is the unit's unadjusted annual SO_2 emissions assigned by EPA/CAMD and based on the values reported to EPA/CAMD. When not available, it is zero. Units that are NBP and not ARP do not report annual SO_2 emissions, so the

emissions were estimated using fuel quantity (back calculated from reported EPA/CAMD heat input and average hear content) and the appropriate EPA-approved emission factor.
Source: EPA/CAMD

21. Boiler Unadjusted Annual EIA-Based Calculated SO_2 Emissions (SO2FAN) –
This field, in tons, is the boiler's unadjusted annual SO_2 emissions calculated using EIA-923 boiler reported data, when available, and the EPA-approved EF. When not available, it is zero.
Source: EIA-923

22. Boiler Unadjusted Annual EPA/CAMD CO_2 Emissions (CO2EAN) –
This field, in tons, is the unit's unadjusted annual CO_2 emissions assigned by EPA/CAMD based on the values reported to EPA/CAMD. Units that are NBP and not ARP do not report annual CO_2 emissions, so the emissions were estimated using reported EPA/CAMD heat input and the appropriate IPCC GHG carbon coefficient. When not available, it is zero. If the fuel for this boiler is biomass, the CO_2 emissions are assigned a zero value (see the Methodology Section for the rationale for biomass adjustments for CO_2).
Source: EPA/CAMD

23. Boiler Unadjusted Annual EIA-Based Calculated CO_2 Emissions (CO2FAN) –
This field, in tons, is the boiler's unadjusted annual CO_2 emissions calculated using EIA-923 boiler reported data, when available, and IPCC GHG carbon coefficients. When not available, it is zero. If the fuel for this boiler is biomass, the CO_2 emissions are assigned a zero value (see the Methodology Section).
Source: EIA-923

24. Source of "Best" Data from EPA/CAMD or EIA-923 Boiler Level (SRCBEST) –
This field describes the one source of the "best" variables (HTIBAN, NOXBAN, SO2BAN, CO2BAN, HTIBOZ, NOXBOZ) – either EPA CAMD or EIA-923.

25. Boiler Unadjusted Annual Best Heat Input (HTIBAN) –
This field, in MMBtu, contains the "best" unadjusted annual heat input value by taking HTIEAN as its value, if it exists; otherwise, HTIFAN's value is used.

26. Boiler Unadjusted Ozone Season Best Heat Input (HTIBOZ) –
This field, in MMBtu, contains the "best" unadjusted ozone season (May through September) heat input value by taking HTIEOZ as its value, if it exists; otherwise, HTIFOZ's value is used.

27. Boiler Unadjusted Annual Best NO_x Emissions (NOXBAN) –
This field, in tons, contains the "best" unadjusted annual NO_x value by taking NOXEAN as its value, if it exists; otherwise NOXFAN's value is used.

28. Boiler Unadjusted Ozone Season Best NO_x Emissions (NOXBOZ) –
This field, in tons, contains the "best" unadjusted ozone season (May through September) NO_x value by taking NOXEOZ as its value, if it exists; otherwise NOXFOZ's value is used.

29. Boiler Unadjusted Annual Best SO_2 Emissions (SO2BAN) –
This field, in tons, contains the "best" unadjusted annual SO_2 value by taking SO2EAN as its value, if it exists; otherwise SO2FAN's value is used.

30. Boiler Unadjusted Annual Best CO_2 Emissions (CO2BAN) –
This field, in tons, contains the "best" unadjusted annual CO_2 value by taking CO2EAN as its value, if it exists; otherwise CO2FAN's value is used.

31. Boiler SO_2 (Scrubber) First Control Device (SO2CTLDV) –
This field contains the first reported SO_2 control device. Values may be combined and separated by commas. This field is based on the "best" data source display in field #24. Possible values are:

	= blank
BR	= Jet bubbling reactor
CD	= Circulating dry scrubber
DA	= Dual alkali
DL FGD	= Dry lime flue gas desulfurization unit
DP	= Dry powder injection type
FBL	= Fluidized bed
MA	= Mechanically aided type
MO	= Magnesium oxide
OT	= Other
PA	= Packed type
SB	= Sodium based
SD	= Spray dryer type
SP	= Spray type
TR	= Tray type
VE	= Venturi type
WL FGD	= Wet lime flue gas desulfurization unit
WLS	= Wet limestone

Sources: EPA/CAMD, EIA-860

32. Boiler NO_x First Control Device (NOXCTLDV) –
This field contains the first reported NO_x control device. Values may be combined and separated by commas. This field is based on the "best" data source display in field #24. Possible values are:

	= Blank
AA	= Advanced overfire air
BF	= Biased firing
CF	= Fluidized bed combustor
CM	= Combustion modification/fuel reburning
DLNB	= Dry low NO_x premixed technology
FR	= Flue gas recirculation
FU	= Fuel reburning
H2O	= Water injection
LA	= Low excess air
LNB or LN	= Low NO_x burner
LNBO	= Low NO_x burner with overfire air
LNC1	= Low NO_x burner technology with close-coupled overfire air
LNC2	= Low NO_x burner technology with separated OFA

LNC3	= Low NO_x burner technology with close-coupled and separated overfire air
LNCB	= Low NO_x burner technology for cell burners
NA	= Not applicable
NH3	= Ammonia injection
OFA or OV	= Overfire air
OT	= Other
SC	= Slagging
SCR or SR	= Selective catalytic reduction
SNCR or SN	= Selective noncatalytic reduction
ST or STM	= Steam injection

Sources: EPA/CAMD, EIA-860

33. Boiler Hg Activated Carbon Injected System Flag (HGCTLDV) –
This field contains an activated carbon injection mercury control flag (1=Yes), based on EIA data.
Source: EIA-860

34. Boiler Year On-Line (BLRYRONL) –
The field provides the four digit boiler year on-line. This field is based on the "best" data source display in field #24.
Source: EPA/CAMD, EIA-860

B. THE GEN (GENERATOR) FILE

There are 15 variables in the second file, GEN, which contains generator level data. Note that summing the generator generation to the plant level may not result in the same values as the plant generation. This file includes generation from steam boilers and nuclear units in the EIA-923 and from those plant-prime movers in the EIA-923 that have only one generator in the EIA-860. The one new variable for this data year is the first one.

1. eGRID2012 year 2009 File Generator Sequence Number (SEQGEN09) –
The generator records in this year 2009 data file are sorted by state postal code abbreviation, plant name, plant code, and generator ID, and are assigned a unique sequential number beginning with 1. This sequence number is unlikely to be the same as the sequence number in the year 20075 eGRID file for the same entity.

2. Plant State Abbreviation (PSTATABB) –
This field contains the two character postal code abbreviation of the state in which the plant is located.
Source: EIA-860

3. Plant Name (PNAME) –
This field is the name associated with each plant.
Source: EIA-860 + updates

4. DOE/EIA ORIS Plant or Facility Code (ORISPL) –
This plant code corresponds to PNAME and was originally developed for power plants by the Office of the Regulatory Information System (ORIS), which was a part of the Federal Power Commission. It is now assigned by EIA and is used as a unique plant identification code for many EPA electric power databases, too. One plant code, that for Laramie River, has been altered. See Section IV for details.
Source: EIA-860 + updates

5. Generator ID (GENID) –
This field identifies the electrical generation unit (generator). In the majority of cases, there is a 1-to-1 correspondence with the boiler ID if it is a steam generator.
Sources: EIA-860

6. Number of Associated Boilers (NUMBLR) –
This field provides the number of EIA-860 boilers associated with each generator in the file.
Sources: EIA-860

7. Generator Status (GENSTAT) –
This field indicates the reported generator status at the end of the given year.
Possible values are:

BU = Back-up
OA = Out of service (returned or will be returned to service)
OP = Operating – in service
OS = Out of service (not expected to be returned to service)
RE = Retired – no longer in service
SB = Stand-by (long-term storage)

TS = Testing, construction complete, but not yet in commercial operation
V = Under constructions, more than 50% constructed

Generators with one of these above generator status values are considered potentially operating generators (including generators with status = 'RE', if the retirement date is the data year or later).
Source: EIA-860

8. Generator Prime Mover Type (PRMVR) –
This field indicates the reported generator's electric generator type.
Possible values are:

BT = Binary cycle turbine
CA = Combined cycle steam turbine
CC = Combined cycle - total unit
CE = Compressed air energy storage
CS = Combined cycle - single shaft
CT = Combined cycle combustion turbine
FC = Fuel cell
GT = Combustion (gas) turbine
HY = Hydraulic turbine
IC = Internal combustion (diesel)
IG = Integrated gasification combustion turbine
OT = Other turbine
PS = Hydraulic turbine - reversible (pumped storage)
PV = Photovoltaic
ST = Steam turbine (boiler, nuclear, geothermal, and solar steam)
WT = Wind turbine

Source: EIA-860

9. Generator Primary Fuel (FUELG1) –
This field indicates the potential primary fuel reported for the generator.
Possible values are:

AB = Agricultural byproduct
BFG = Blast furnace gas
BIT = Bituminous coal
BLQ = Black liquor
DFO = Distillate fuel oil, light fuel oil, FO2, diesel oil
DG = Digester gas (other biomass gas)
GEO = Geothermal
JF = Jet fuel
KER = Kerosene
LFG = Landfill gas
LIG = Lignite coal
MSB = Municipal solid waste biomass component
NG = Natural gas
NUC = Nuclear materiel
OBL = Other biomass liquid
OBS = Other biomass solid
OG = Other gas
OTH = Other unknown
PC = Petroleum coke
PUR = Purchased steam

RFO = Residual fuel oil, heavy fuel oil, petroleum
SC = Synthetic coal (syncoal)
SUB = Subbituminous coal
SUN = Solar
TDF = Tire-derived fuel
WAT = Water
WC = Waste coal
WDL = Wood, Wood waste liquid
WDS = Wood, Wood waste solid
WH = Waste heat
WND = Wind
WO = Waste oil

Source: EIA-860

10. Generator Nameplate Capacity (NAMEPCAP) –
This field indicates the nameplate capacity, in MW, of the generator.
Source: EIA-860

11. Generator Capacity Factor (CFACT) –
This field is calculated at the generator level:
CFACT = (GENNTAN) / (NAMEPCAP * 8760).
The value should be between 0 and 1 exclusive. However, there are outliers.

12. Generator Annual Net Generation (GENNTAN) –
This field is the reported net generation in MWh. Note that summing the net generation of the generators in a plant may not provide a value that is the same as the plant generation value, PLNGENAN, since the data sources are often different.
Sources: EIA-923

13. Generator Ozone Season Net Generation (GENNTOZ) –
This field is the generator five month ozone season (May through September) net generation in MWh. For plants that reported monthly data, it is based on monthly generator generation data. Otherwise, it is calculated as 5/12 of the annual value.
Sources: EIA-923

14. Generation Data Source (GENERSRC) –
This field describes the data source of the generator net generation data. The values are as follows:

F860 = EIA-860 generator level,
F923NK = EIA-923 nuclear unit
F923NONK = EIA-923 only generator at that plant's prime mover
F923ST = EIA-923 ST unit

15. Generator Year On-Line (GENYRONL) –
This field provides the four digit generator year on-line.
Source: EIA-860

C. THE PLNT (PLANT) FILE

There are 164 variables in PLNT. Some data may be outliers and should be viewed with caution.

1. eGRID2012 year 2009 File Plant Sequence Number (SEQPLT09) –
The plant records in this year 2009 data file are sorted by state postal code abbreviation, plant name, and boiler ID, and are assigned a unique sequential number beginning with 1. This sequence number is unlikely to be the same as the sequence number in the year 2007 eGRID2010 file for the same entity.
This is a new field in eGRID2012.

2. Plant State Abbreviation (PSTATABB) –
This field contains the two character postal code abbreviation of the state in which the plant is located.
Source: EIA-860

3. Plant Name (PNAME) –
This field is the name associated with each plant.
Source: EIA-860 + updates

4. DOE/EIA ORIS Plant or Facility Code (ORISPL) –
This plant code corresponds to PNAME and was originally developed for power plants by the Office of the Regulatory Information System (ORIS), which was a part of the Federal Power Commission. It is now assigned by EIA and is used as a unique plant identification code for many EPA electric power databases, too. One plant code, that for Laramie River, has been altered. See Section IV for details.
Source: EIA-860 + updates

5. Plant EPA Facility Registry System FRS Identification Code (FRSID) –
This field is the EPA Facility Registry System (FRS) code associated with the ORISPL. This field is blank for year 2009 data because of data inconsistencies.
Source: EPA FRS

6. Plant Operator Name (OPRNAME) –
The name associated with each operating company (EGC) is contained in this field.
Source: EIA-860

7. Plant Operator ID (OPRCODE) –
This field contains the operating company ID. Each operating company has a unique company code assigned by EIA, with some exceptions. Some operator names do not have associated codes assigned by EIA and are EPA-assigned. See Section IV for details.
Source: EIA-860

8. Utility Service Territory Name (UTLSRVNM) –
This field contains the name of the owner of the transmission/distribution company/EGC, also known as the utility service territory (a utility company or EGC) [and previously known as the utility service area] in which the plant is located. See Section IV for further details.
Source: EIA-860 + updates

9. Utility Service Territory ID (UTLSRVID) –
This field contains the unique ID code associated with the utility service territory name.
Source: EIA-860 + updates

10. ID of the Operator's Parent Company (OPPRNUM) –
This field contains the ID of the plant's operator's parent company, if it exists. It is zero otherwise. EIA did not assign IDs for most parent companies; thus, EPA assigned unique negative integer IDs beginning with -7001 as parent company IDs. It is zero for year 2009 data.

11. Name of the Operator's Parent Company (OPPRNAME) –
This field contains the name of the plant's operator's parent company, if it exists. It is blank otherwise. It is blank for year 2009 data.

12. Power Control Area Name (PCANAME) –
This field contains the name of the power control area for the plant. The PCA is associated with the plant's eGRID subregion and NERC region. See the Methodology Section for further information about PCAs.
Sources: NERC, EIA-861 + updates

13. Power Control Area ID (PCAID) –
This field contains the ID of the power control area for the plant. See the Methodology Section for further information about PCAs.
Sources: NERC, EIA-861 + updates

14. NERC Region Acronym (NERC) –
This field contains the acronym for the NERC region in which the plant is located. The NERC region is associated with the plant's PCA and eGRID subregion. See the Methodology Section for further information about NERC regions. A representation of the eGRID2012 NERC region map is included in Appendix B.
Source: NERC

15. eGRID Subregion Acronym (SUBRGN) –
This field contains the acronym for the eGRID subregion in which the plant is located. The eGRID subregion is associated with the plant's PCA and NERC region. See the Methodology Section for further information about eGRID subregions. A representation of the eGRID2012 eGRID subregion map is included in Appendix B.
Source: EPA

16. eGRID Subregion Name (SRNAME) –
This field contains the name of the eGRID subregion in which the plant is located. See the Methodology Section for further information about eGRID subregions.
Source: EPA

17. Plant associated ISO/RTO Territory (ISORTO) –
This field contains the name, if applicable, of the Independent System Operator (ISO) or Regional Transmission Organization (RTO) associated with the plant.
Possible values are CAISO, ERCOT, ISONE, MISO, NYISO, PJM, SPP, OTHER, or blank.
This is a new field in eGRID2012.
Source: EIA-860 (2010) + updates

18. Plant FIPS State Code (FIPSST) –
This field contains the two digit Federal Information Processing Standards (FIPS) state character code of the state in which the plant is located. The codes are from the National Institute of Standards and technology (NIST, undated).
Source: NIST based

19. Plant FIPS County Code (FIPSCNTY) –
This field contains the three digit FIPS county character code of the county in which the plant is located. The codes are from the National Institute of Standards and technology (NIST, undated).
Source: NIST based

20. Plant County Name (CNTYNAME) –
This field corresponds to FIPSST and contains the name of the county in which the plant is located.
Source: EIA-860, EPA/CAMD

21. Plant Latitude (LAT) –
This field contains the latitude, in degrees to four decimal places, associated with the plant. When not available, the plant's county centroid's y-coordinate is used.
Source: EPA/CAMD, EIA + updates

22. Plant Longitude (LON) –
This field contains the longitude, in degrees to four decimal places, associated with the plant. When not available, the plant's county centroid's x-coordinate is used.
Source: EPA/CAMD, EIA + updates

23. Country Centroid flag (CCFLAG) –
This field indicates if the plant's latitude and longitude (fields # 20 and # 21) are based on the county centroid (1= county centroid used).

24. Number of Boilers (NUMBLR) –
This field contains the number of operating boilers or turbines within a plant. Note that the meaning and sources of these data are different from the data element of the same name in the generator file.
Source: EPA/CAMD, EIA-860 calculated

25. Number of Generators (NUMGEN) –
This field contains the number of potentially operating generators within a plant. Note that the meaning and source of these data are different from the data element of the same name in the boiler file.
Source: EIA-860 calculated

26. Plant combustion status (COMBUST) –
This field contains the plant combustion status: Possible values are: 1= Combusts, 0 = No combustion, 0.5 = Partial combustion.

27. Plant Emissions Source(s) (SOURCEM) –
This field describes the source(s) of emissions data for the plant. Values may be combined and separated by commas.

Possible values are:

EPA CAMD	= NO_x, SO_2, and CO_2 emissions reported to EPA's Emissions tracking System/Continuous Emissions Monitoring System (EPA/CAMD) if in the ARP program; otherwise estimated by applying EPA-approved EF to EPA/CAMD data for year 2009. CH_4 and N_2O emission estimated by applying EPA-approved EF to EPA/CAMD data for year 2009.
EIA-923	= NO_x, SO_2, CO_2, CH_4, and N_2O emissions estimated by applying EPA-approved EF to EIA-923 boiler-level data for year 2009.
EIA-906	= NO_x, SO_2, CO_2, CH_4, and N_2O emissions estimated by applying EPA-approved EF to EIA-923 plant-prime mover-level data for year 2009.

28. Plant Primary Fuel (PLPRMFL) –

This field contains the plant's primary fuel based on maximum heat input if the plant combusts any fuel or assignment if the plant does not combust any fuel. Possible values are:

AB	= Agricultural byproduct
BFG	= Blast furnace gas
BG	= Bagasse
BIT	= Bituminous coal
BLQ	= Black liquor
COG	= Coke oven gas
DFO	= Distillate fuel oil, light fuel oil, FO2, diesel oil
DG	= Digester gas (other biomass gas)
GEO	= Geothermal steam
HY	= Hydrogen
JF	= Jet fuel
KER	= Kerosene
LFG	= Landfill gas
LIG	= Lignite coal
MSB	= Municipal solid waste biomass component
NG	= Natural gas
NUC	= Nuclear materiel
OBL	= Other biomass liquid
OBS	= Other biomass solid
OG	= Other gas
OO	= Other oil check that it is not OOL
OTH	= Other (unknown)
OTL	= Other liquid
PC	= Petroleum coke
PG	= Propane gas/LPG
PP	= Paper pellets
PRG	= Process gas
PUR	= Purchased fuel (unknown)
RFO	= Residual fuel oil, heavy fuel oil, petroleum
RG	= Refinery gas
SC	= Synthetic coal (syncoal)
SLW	= Sludge waste

SUB = Subbituminous coal
SUN = Sun
TDF = Tire-derived fuel
WAT = Water
WC = Waste coal
WDL = Wood, wood waste liquid
WDS = Wood, wood waste solid
WND = Wind
WO = Waste oil

29. Plant Primary Coal/Oil/Gas/Other Fossil Fuel Category (PLFUELCT) –
The value of this field is "COAL" if PLPRMFL is derived from coal, "OIL" if it is derived from oil, "GAS" if it is derived from gas, or "OFSL" if it is other fossil. Fossil fuel refers to any naturally occurring organic fuel, such as petroleum, coal, and natural gas. See the Methodology Section for a complete list of fuel codes and categories.

30. Plant Primary Fuel Generation Category (PLPFGNCT) –
This field contains the plant's primary fuel based on maximum net generation if the plant generates. Possible values are based on the 11 that are used for resource mix: COAL, OIL, GAS, NUCLEAR, HYDRO, BIOMASS, WIND, SOLAR, GEOTHERMAL, OTHRFOSL, and WSTHTOTPUR (Other Unknown/Purchased/Waste Heat).

31. Flag indicating if the plant burned or generated any amount of coal (COALFLAG) –
This field contains a flag to indicate if the plant burned or, if it has positive heat input and generated electricity from coal (1= Yes). If a plant has negative coal generation and no coal heat input for a given year, the coal flag does not have the value of 1; this condition is new for year 2009 data.

32. Plant Capacity Factor (CAPFAC) –
This field contains the plant capacity factor, expressed with four decimal places. It is calculated as follows:
CAPFAC = (PLNGENAN / (NAMEPCAP * 8760))
Although the value should be between 0 and 1 inclusive, there are outliers.

33. Plant Nameplate Capacity (NAMEPCAP) –
This field contains the nameplate capacity of the plant, in MW.
Source: EIA-860 summed

34. Biogas/Biomass Plant Adjustment Flag (RMBMFLAG) –
This field contains the biogas (landfill gas, digester gas)/biomass adjustment flag. A biomass facility's emissions reported in eGRID may be different from that reported in other EPA sources such as EPA/CAMD's emissions data.
Possible values are:

0 = No biomass
1 = Biogas included
100 = Other biomass included
71 = Biogas adjustments for CAMD emissions
7100 = Biomass adjustment for CAMD CO_2

For details, see the Methodology Section.

35. Combined Heat and Power (CHP) Plant Adjustment Flag (CHPFLAG) –
This field contains a flag to indicate if the plant is a CHP facility (1=Yes). A CHP facility's emissions and heat input reported in eGRID may be different from that reported in other EPA sources such as EPA/CAMD's emissions data. For details, see the Methodology Section.
Source: eGRID CHP list

36. CHP Plant Useful Thermal Output (USETHRMO) –
This field, in MMBtu, contains the useful thermal output estimated for a CHP facility.
Source: EIA-923 calculated

37. CHP Plant Power to Heat Ratio (PWRTOHT) –
This field contains the power to heat ratio for a CHP facility, which is the ratio of the heat value of electricity generated (3413 * kWh output) to the facility's useful thermal output. There are outliers.

38. CHP Plant Electric Allocation Factor (ELCALLOC) –
This field contains the CHP plant's decimal fraction of the emissions that is attributed to electricity. It is derived as the ratio of the electric heat output to the sum of the electric and steam heat outputs, where the steam output is 75% of the useful thermal output. The electric allocation factor is used to allocate emissions from a CHP facility to both electricity generation and useful thermal output. For non-CHP plants, eGRID uses an electric allocation factor of 1.0. See the Methodology Section for further information.

39. Plant Pumped Storage Flag (PSFLAG) –
This field indicates if the plant has at least one pumped storage generator (1= Yes).
Source: EIA-860

40. Plant Annual Heat Input (PLHTIAN) –
This field is the total annual heat input, in MMBtu, for the plant. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

41. Plant Ozone Season Heat Input (PLHTIOZ) –
This field is the five month ozone season (May through September) heat input, in MWh, for the plant. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

42. Plant Annual Net Generation (PLNGENAN) –
This field is the total reported annual net generation, in MWh, for the plant.
Sources: EIA-923, EPA/CAMD calculated

43. Plant Ozone Season Net Generation (PLNGENOZ) –
This field, in MWh, is the five month ozone season (May through September) net generation for the plant.
Sources: EIA-923, EPA/CAMD calculated

44. Plant Annual NO_x Emissions (PLNOXAN) –
This field, in tons, is the total annual NO_x emissions for the plant. Biogas components are adjusted. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

This adjusted emissions field is estimated by first making the biogas adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

45. Plant Ozone Season NO_x Emissions (PLNOXOZ) –
This field, in tons, is the five month ozone season (May through September) NO_x emissions for the plant. Biogas components are adjusted. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

This adjusted emissions field is estimated by first making the biogas adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

46. Plant Annual SO_2 Emissions (PLSO2AN) –
This field, in tons, is the total annual SO_2 emissions for the plant. Biogas components are adjusted. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

This adjusted emissions field is estimated by first making the biogas adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

47. Plant Annual CO_2 Emissions (PLCO2AN) –
This field, in tons, is the total annual CO_2 emissions for the plant. All estimated CO_2 emissions from biomass fuels are adjusted to zero. The biomass fuel components' CO_2 CAMD emissions are excluded (adjusted to zero) by the same biomass fuel component percentage as that in the EIA-923 for the adjusted CO_2 CAMD emissions; prior to year 2007, these emissions, if CAMD-reported, were only zeroed out if the primary fuel was a biomass fuel. For CHP plants, the value is adjusted by the electric allocation factor.

This adjusted emissions field is estimated by first making the biomass adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

48. Plant Annual CH_4 Emissions (PLCH4AN) –
This field, in lbs, is the total annual CH_4 emissions for the plant. Biogas biomass components are adjusted. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

This adjusted emissions field is estimated by first making the biomass adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

49. Plant Annual N_2O Emissions (PLN2OAN) –
This field, in lbs, is the total annual N_2O emissions for the plant. Biogas biomass components are adjusted. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

This adjusted emissions field is estimated by first making the biomass adjustment (if it exists) and then applying the electric allocation factor (if the plant is a CHP). See the Methodology Section for details.

50. Plant Annual CO_2 Equivalent Emissions (PLCO2EQA) –
This field, in U.S. tons, is the annual CO_2 equivalent emissions for the plant. This value is a universal standard of measurement. The GWPs from the second IPCC assessment are used per EPA for the calculation; the formula used is as follows:

PLCO2EQA = ((1* PLCO2AN) + (21* PLCH4AN / 2000) + (310 * PLN2OAN / 2000)).

This value can be converted to metric tonnes by dividing by 1.1023. See the Methodology Section for details.

51. Plant Annual Hg Emissions (PLHGAN) –
This field, in lbs, is the total annual Hg emissions for the plant. For CHP plants, the value is adjusted by the electric allocation factor. See the Methodology Section for details.

52. Plant Annual NO_x Total Output Emission Rate (PLNOXRTA) –
This field, in lb/MWh, is calculated as follows:
PLNOXRTA = 2000 * (PLNOXAN / PLNGENAN).

53. Plant Ozone Season NO_x Total Output Emission Rate (PLNOXRTO) –
This field, in lb/MWh, is calculated as follows:
PLNOXRTO = 2000 * (PLNOXOZ / PLNGENOZ).

54. Plant Annual SO_2 Total Output Emission Rate (PLSO2RTA) –
This field, in lb/MWh, is calculated as follows:
PLSO2RTA = 2000 * (PLSO2AN / PLNGENAN).

55. Plant Annual CO_2 Total Output Emission Rate (PLCO2RTA) –
This field, in lb/MWh, is calculated as follows:
PLCO2RTA = 2000 * (PLCO2AN / PLNGENAN).

56. Plant Annual CH_4 Total Output Emission Rate (PLCH4RTA) –
This field, in lb/GWh, is calculated as follows:
PLCH4RTA = PLCH4AN / (PLNGENAN / 1000).

57. Plant Annual N_2O Total Output Emission Rate (PLN2ORTA) –
This field, in lb/GWh, is calculated as follows:
PLN2ORTA = PLN2OAN / (PLNGENAN / 1000).

58. Plant Annual CO_2 Equivalent Total Output Emission Rate (PLC2ERTA) –
This field, in lb/MWh, is calculated as follows:
PLC2ERTA = 2000 * (PLCO2EQA / PLNGENAN).

59. Plant Annual Hg Total Output Emission Rate (PLHGRTA) –
This field, in lb/GWh, is calculated as follows:
PLHGRTA = PLHGAN / (PLNGENAN / 1000).

60. Plant Annual NO_x Input Emission Rate (PLNOXRA) –
This field, in lb/MMBtu, is calculated as follows:
PLNOXRA = 2000 * (PLNOXAN / PLHTIAN).

61. Plant Ozone Season NO_x Input Emission Rate (PLNOXRO) –
This field, in lb/MMBtu, is calculated as follows:
PLNOXRO = 2000 * (PLNOXOZ / PLHTIOZ).

62. Plant Annual SO_2 Input Emission Rate (PLSO2RA) –
This field, in lb/MMBtu, is calculated as follows:
PLSO2RA = 2000 * (PLSO2AN / PLHTIAN).

63. Plant Annual CO_2 Input Emission Rate (PLCO2RA) –
This field, in lb/MMBtu, is calculated as follows:
PLCO2RA = (2000 * (PLCO2AN / PLHTIAN).

64. Plant Annual Hg Input Emission Rate (PLHGRA) –
This field, in lb/BBtu, is calculated as follows:
PLHGRA = PLHGAN / (PLHTIAN / 1000).

65. Plant Annual NO_x Combustion Output Emission Rate (PLNOXCRT) –
This field, in lb/MWh, is calculated as follows:
PLNOXCRT = 2000 * (PLNOXAN / PLGENACY).

66. Plant Ozone Season NO_x Combustion Output Emission Rate (PLNOXCRO) –
This field, in lb/MWh, is calculated as follows:
PLNOXCRO = 2000 * (PLNOXOZ / ((PLGENACY * PLNGENOZ) / PLNGENAN)).

67. Plant Annual SO_2 Combustion Output Emission Rate (PLSO2CRT) –
This field, in lb/MWh, is calculated as follows:
PLSO2CRT = 2000 * (PLSO2AN / PLGENACY).

68. Plant Annual CO_2 Combustion Output Emission Rate (PLCO2CRT) –
This field, in lb/MWh, is calculated as follows:
PLCO2CRT = 2000 * (PLCO2AN / PLGENACY).

69. Plant Annual CH_4 Combustion Output Emission Rate (PLCH4CRT) –
This field, in lb/GWh, is calculated as follows:
PLCH4CRT = PLCH4AN / (PLGENACY / 1000).

70. Plant Annual N_2O Combustion Output Emission Rate (PLN2OCRT) –
This field, in lb/GWh, is calculated as follows:
PLN2OCRT = PLN2OAN / (PLGENACY / 1000).

71. Plant Annual Hg Combustion Output Emission Rate (PLHGCRT) –
This field, in lb/GWh, is calculated as follows:
PLHGCRT = PLHGAN / (PLGENACY / 1000).

72. Plant Unadjusted Annual NO_x Emissions (UNNOX) –
This field, in tons, is the total plant level unadjusted annual NO_x emissions. See the Methodology Section for details.

73. Plant Unadjusted Ozone Season NO_x Emissions (UNNOXOZ) –
This field, in tons, is the unadjusted five month ozone season (May through September) NO_x emissions for the plant. See the Methodology Section for details.

74. Plant Unadjusted Annual SO_2 Emissions (UNSO2) –
This field, in tons, is the total plant level unadjusted annual SO_2 emissions. See the Methodology Section for details.

75. Plant Unadjusted Annual CO_2 Emissions (UNCO2) –
This field, in tons, is the total plant level unadjusted annual CO_2 emissions. Beginning in year 2007, the biomass fuel components' CO_2 emissions will be included in the unadjusted CO_2 plant emissions. See the Methodology Section for details.

76. Plant Unadjusted Annual CH_4 Emissions (UNCH4) –
This field, in lbs, is the total plant level unadjusted annual CH_4 emissions. See the Methodology Section for details.

77. Plant Unadjusted Annual N_2O Emissions (UNN2O) –
This field, in lbs, is the total plant level unadjusted annual N_2O emissions. See the Methodology Section for details.

78. Plant Unadjusted Annual Hg Emissions (UNHG) –
This field, in lbs, is the total plant level unadjusted annual Hg emissions. Mercury emissions are reported for year 2002 for coal plants and for year 2000 for large municipal waste combustors, and for eGRID, are estimated for year 2005. See the Methodology Section for details.

79. Plant Unadjusted Annual Heat Input (UNHTI) –
This field, in MMBtu, is the total plant level unadjusted annual heat input. See the Methodology Section for details.
Sources: EPA/CAMD, EIA-923

80. Plant Unadjusted Ozone Season Heat Input (UNHTIOZ) –
This field, in MMBtu, is the five month ozone season (May through September) heat input for the plant. See the Methodology Section for details.
Sources: EPA/CAMD, EIA-923

81. Plant Nominal Heat Rate (PLHTRT) –
This field, in Btu/kWh, contains the plant nominal heat rate for at least partially combusted plants. It is calculated as follows:
PLHTRT = 1000 * (PLHTIAN / PLNGENAN) for combustion plants; and
PLHTRT = 1000 * (PLHTIAN / PLGENACY) for partial combustion plants.

For CHP plants, the value is, in effect, adjusted by the electric allocation factor, since the heat input has been adjusted.
This field's definition has been modified for eGRID2012.

82. Plant Annual Coal Net Generation (PLGENACL) –
This field, in MWh, contains the plant annual net generation for coal. Fuel codes that are included in coal are BIT, SUB, LIG, WC, and SC.

83. Plant Annual Oil Net Generation (PLGENAOL) –
This field, in MWh, contains the plant annual net generation for oil. Fuel codes included in oil are DFO, JF, KER, OO, PC, RFO, RG, and WO.

84. Plant Annual Gas Net Generation (PLGENAGS) –
This field, in MWh, contains the plant annual net generation for natural gas. Fuel codes included in gas are NG and PG.

85. Plant Annual Nuclear Net Generation (PLGENANC) –
This field, in MWh, contains the plant annual net generation for nuclear if the fuel code is NUC. Note that one plant, North Anna, has both nuclear and hydro prime movers, but the greater generation is associated with nuclear

86. Plant Annual Hydro Net Generation (PLGENAHY) –
This field, in MWh, contains the plant annual net generation for hydro if the fuel code is WAT.

87. Plant Annual Biomass Net Generation (PLGENABM) –
This field, in MWh, contains the plant annual net generation for biomass. Biomass is a fuel derived from organic matter such as wood and paper products, agricultural waste, or methane (e.g., from landfills). The renewable portion of solid waste, fuel code MSB, is included as biomass, as are AB, BLQ, DG, LFG, ME, OBL, OBS, PP, SLW, WDL, and WDS. See the Methodology Section for more information.

88. Plant Annual Wind Net Generation (PLGENAWI) –
This field, in MWh, contains the plant annual net generation for wind if the fuel code is WND.

89. Plant Annual Solar Net Generation (PLGENASO) –
This field, in MWh, contains the plant annual net generation for solar if the fuel code is SUN.

90. Plant Annual Geothermal Net Generation (PLGENAGT) –
This field, in MWh, contains the plant annual net generation for geothermal if the fuel code is GEO.

91. Plant Annual Other Fossil Net Generation (PLGENAOF) –
This field, in MWh, contains the plant annual net generation for other fossil fuel that cannot be categorized as coal, oil, or gas. Other fossil fuel codes include BFG, COG, HY, LB, MH, MSF, OG, PRG, and TDF.

92. Plant Annual Other Unknown/ Purchased Fuel Net Generation (PLGENAOP) –
This field, in MWh, contains the plant annual net generation for other unknown/purchased if the fuel code is OTH or PUR or WH.

93. Plant Annual Total Nonrenewables Net Generation (PLGENATN) –
This field, in MWh, contains the annual total nonrenewables net generation for the plant. Nonrenewables are exhaustible energy resources such as coal, oil, gas, other fossil, nuclear power, and other unknown/purchased fuel. This field is the sum of PLGENACL, PLGENAOL, PLGENAGS, PLGENAOF, PLGENANC, and PLGENAOP.

94. Plant Annual Total Renewables Net Generation (PLGENATR) –
This field, in MWh, contains the annual total renewables net generation for the plant. Renewables are inexhaustible energy resources such as biomass, wind, solar, geothermal, and hydro. This field is the sum of PLGENABM, PLGENAWI, PLGENASO, PLGENAGT, and PLGENAHY.

95. Plant Annual Total Nonhydro Renewables Net Generation (PLGENATH) –
This field, in MWh, contains the annual total nonhydro renewables net generation for the plant. This field is the sum of PLGENABM, PLGENAWI, PLGENASO, and PLGENAGT.

96. Plant Annual Total Combustion Net Generation (PLGENACY) –
This field, in MWh, contains the annual total combustion net generation for the plant. This field is the sum of PLGENACL, PLGENAOL, PLGENAGS, PLGENAOF, PLGENABM, and PLGENAOP.

97. Plant Annual Total Noncombustion Net Generation (PLGENACN) –
This field, in MWh, contains the annual total noncombustion net generation for the plant. This field is the sum of PLGENANC, PLGENAHY, PLGENAWI, PLGENASO, and PLGENAGT.

98. Plant Coal Generation Percent (PLCLPR) –
This field, the coal resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLCLPR = 100 * (PLGENACL / PLNGENAN).

99. Plant Oil Generation Percent (PLOLPR) –
This field, the oil resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLOLPR = 100 * (PLGENAOL / PLNGENAN).

100. Plant Gas Generation Percent (PLGSPR) –
This field, the gas resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLGSPR = 100 * (PLGENAGS / PLNGENAN).

101. Plant Nuclear Generation Percent (PLNCPR) –
This field, the nuclear resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLNCPR = 100 * (PLGENANC / PLNGENAN).

102. Plant Hydro Generation Percent (PLHYPR) –
This field, the hydro resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLHYPR = 100 * (PLGENAHY / PLNGENAN).

103. Plant Biomass Generation Percent (PLBMPR) –
This field, the biomass resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLBMPR = 100 * (PLGENABM / PLNGENAN).

104. Plant Wind Generation Percent (PLWIPR) –
This field, the wind resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLWIPR = 100 * (PLGENAWI / PLNGENAN).

105. Plant Solar Generation Percent (PLSOPR) –
This field, the solar resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLSOPR = 100 * (PLGENASO / PLNGENAN).

106. Plant Geothermal Generation Percent (PLGTPR) –
This field, the geothermal resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLGTPR = 100 * (PLGENAGT / PLNGENAN).

107. Plant Other Fossil Generation Percent (PLOFPR) –
This field, the other fossil resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLOFPR = 100 * (PLGENAOF / PLNGENAN).

108. Plant Other Unknown/Purchased Fuel Generation Percent (PLOPPR) –
This field, the other unknown/purchased fuel/waste heat resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLOPPR = 100 * (PLGENAOP / PLNGENAN).

109. Plant Total Nonrenewables Generation Percent (PLTNPR) –
This field, the total nonrenewables resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLTNPR = 100 * (PLGENATN / PLNGENAN).

110. Plant Total Renewables Generation Percent (PLTRPR) –
This field, the total renewables resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLTRPR = 100 * (PLGENATR / PLNGENAN).

111. Plant Total Nonhydro Renewables Generation Percent (PLTHPR) –
This field, the total nonhydro renewables resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLTHPR = 100 * (PLGENATH / PLNGENAN).

112. Plant Total Combustion Generation Percent (PLCYPR) –
This field, the total combustion resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLCYPR = 100 * (PLGENACY / PLNGENAN).

113. Plant Total Noncombustion Generation Percent (PLCNPR) –
This field, the total noncombustion resource mix expressed as a percent of plant annual net generation, is calculated as follows:
PLCNPR = 100 * (PLGENACN / PLNGENAN).

114. Plant Owner Name (First) (OWNRNM01) –
This field contains the name of the first plant owner, a company or EGC.
Sources: EIA-860

115. Plant Owner Code (First) (OWNRUC01) –
This field contains the unique company code associated with OWNRNM01 and assigned by EIA, with some exceptions. Some owner names do not have associated codes assigned by EIA and are EPA-assigned. If no information on ownership is provided, then it is assumed that the operator has 100% ownership. See the Methodology Section and Section IV for details.
Source: EIA-860

116. Plant Owner Percent (First) (OWNRPR01) –
This field contains the percent of the plant that is owned by OWNRNM01. It is calculated based on reported generator ownership data. If no information on ownership is provided, then it is assumed that the operator has 100% ownership. See the Methodology Section and Section IV for details.
Source: EIA-860

117. Plant Owner Name (Second) (OWNRNM02) –
This field contains the name of the second plant owner.
Source: EIA-860

118. Plant Owner Code (Second) (OWNRUC02) –
This field contains the unique EIA-assigned number associated with OWNRNM02.
Some owner names do not have associated codes assigned by EIA and are EPA-assigned.
If no information on ownership is provided, then it is assumed that the operator has 100% ownership.
See the Methodology Section and Section IV for details.
Source: EIA-860

119. Plant Owner Percent (Second) (OWNRPR02) –
This field contains the percent of the plant that is owned by OWNRNM02. It is calculated based on reported generator ownership data.
Some owner names do not have associated codes assigned by EIA and are EPA-assigned.
If no information on ownership is provided, then it is assumed that the operator has 100% ownership.
See the Methodology Section and Section IV for details.
Source: EIA-860.

120. – 161. Plant Owner Name, Plant Owner Code, and Plant Owner Percent (Third - Sixteenth) –
The description of these fields contains the information for the third through sixteenth plant owners. See the descriptions in fields #113 through #115 above.
Source: EIA-860

162. eGRID2006 year 2004 File Plant Sequence Number (SEQPLT04) –
This field contains the sequence number of the plant in the year 2004 data, if one exists. This sequence number is unlikely to be the same as the sequence number in the year 2005 eGRID2007 file for the same plant.

163. eGRID2007 year 2005 File Plant Sequence Number (SEQPLT05) –
This field contains the sequence number of the plant in the year 2005 data, if one exists. This sequence number is unlikely to be the same as the sequence number in the year 2007 eGRID2010 file for the same plant.

164. eGRID2010 year 2005 File Plant Sequence Number (SEQPLT05) –
This field contains the sequence number of the plant in the year 2007 data, if one exists. This sequence number is unlikely to be the same as the sequence number in the year 2009 eGRID2012 file for the same plant.

D. THE ST (STATE) FILE

There are 111 variables in the fourth file, ST, which contains state level data. All size, heat input, generation, and emission values are derived by aggregating from the plant level based on the state in which the plant is located. Variables that are either identical to those in the plant file or different from those in the plant file by the first two letters of their names (e.g., STHTIAN instead of PLHTIAN) are not re-described. Aggregated variable names generally begin with "ST." The one new variable for this data year is the first one.

1. **eGRID2012 year 2009 File State Sequence Number (SEQST09) –**
   The state records in this year 2009 data file are sorted by state postal code abbreviation and are assigned a unique sequential number beginning with 1. This is a new field in eGRID2012.

2. **State Abbreviation (PSTATABB) –**

3. **FIPS State Code (FIPSST) –**

4. **State Nameplate Capacity (NAMEPCAP) –**

5. **State Annual Heat Input (STHTIAN) –**

6. **State Ozone Season Heat Input (STHTIOZ) –**

7. **State Annual Net Generation (STNGENAN) –**

8. **State Ozone Season Net Generation (STNGENOZ) –**

9. **State Annual NO_x Emissions (STNOXAN) –**

10. **State Ozone Season NO_x Emissions (STNOXOZ) –**

11. **State Annual SO_2 Emissions (STSO2AN) –**

12. **State Annual CO_2 Emissions (STCO2AN) –**

13. **State Annual CH_4 Emissions (STCH4AN) –**

14. **State Annual N_2O Emissions (STN2OAN) –**

15. **State Annual CO_2 Equivalent Emissions (STCO2EQA) –**
    This field, in tons, is the sum of each state's plants' PLCO2EQA.

16. **State Annual Hg Emissions (STHGAN) –**

17. **State Annual NO_x Total Output Emission Rate (STNOXRTA) –**
    This field, in lb/MWh, is calculated as follows:
    STNOXRTA = 2000 * (STNOXAN / STNGENAN).

18. **State Ozone Season NO_x Total Output Emission Rate (STNOXRTO) –**
This field, in lb/MWh, is calculated as follows:
STNOXRTO = 2000 * (STNOXOZ / STNGENOZ).

19. **State Annual SO_2 Total Output Emission Rate (STSO2RTA) –**
This field, in lb/MWh, is calculated as follows:
STSO2RTA = 2000 * (STSO2AN / STNGENAN).

20. **State Annual CO_2 Total Output Emission Rate (STCO2RTA) –**
This field, in lb/MWh, is calculated as follows:
STCO2RTA = 2000 * (STCO2AN / STNGENAN).

21. **State Annual CH_4 Total Output Emission Rate (STCH4RTA) –**
This field, in lb/GWh, is calculated as follows:
STHCH4RTA = STCH4AN / (STNGENAN / 1000).

22. **State Annual N_2O Total Output Emission Rate (STN2ORTA) –**
This field, in lb/GWh, is calculated as follows:
STN2ORTA = STN2OAN / (STNGENAN / 1000).

23. **State Annual CO_2 Equivalent Total Output Emission Rate (STC2ERTA) –**
This field, in lb/MWh, is calculated as follows:
STC2ERTA = 2000 * (STCO2EQA / STNGENAN).

24. **State Annual Hg Total Output Emission Rate (STHGRTA) –**
This field, in lb/GWh, is calculated as follows:
STHGRTA = STHGAN / (STNGENAN / 1000).

25. **State Annual NO_x Input Emission Rate (STNOXRA) –**
This field, in lb/MMBtu, is calculated as follows:
STNOXRA = 2000 * (STNOXAN / STHTIAN).

26. **State Ozone Season NO_x Input Emission Rate (STNOXRO) –**
This field, in lb/MMBtu, is calculated as follows:
STNOXRO = 2000 * (STNOXOZ / STHTIOZ).

27. **State Annual SO_2 Input Emission Rate (STSO2RA) –**
This field, in lb/MMBtu, is calculated as follows:
STSO2RA = 2000 * (STSO2AN / STHTIAN).

28. **State Annual CO_2 Input Emission Rate (STCO2RA) –**
This field, in lb/MMBtu, is calculated as follows:
STCO2RA = 2000 * (STCO2AN / STHTIAN).

29. **State Annual Hg Input Emission Rate (STHGRA) –**
This field, in lb/BBtu, is calculated as follows:
STHGRA = STHGAN / (STHTIAN / 1000).

30. State Annual NO_x Combustion Output Emission Rate (STNOXCRT) –
This field, in lb/MMBtu, is calculated as follows:
STNOXCRT =2000 * (STNOXAN / STGENACY).

31. State Ozone Season NO_x Combustion Output Emission Rate (STNOXCRO) –
This field, in lb/MMBtu, is calculated as follows:
STNOXCRO = 2000 * (STNOXOZ / ((STGENACY*STNGENOZ)/STNGENAN)).

32. State Annual SO_2 Combustion Output Emission Rate (STSO2CRT) –
This field, in lb/MMBtu, is calculated as follows:
STSO2CRT = 2000 * (STSO2AN / STGENACY).

33. State Annual CO_2 Combustion Output Emission Rate (STCO2CRT) –
This field, in lb/MMBtu, is calculated as follows:
STCO2CRT = 2000 * (STCO2AN / STGENACY).

34. State Annual CH_4 Combustion Output Emission Rate (STCH4CRT) –
This field, in lb/BBtu, is calculated as follows:
STCH4CRT = STCH4AN / (STGENACY / 1000).

35. State Annual N_2O Combustion Output Emission Rate (STN2OCRT) –
This field, in lb/BBtu, is calculated as follows:
STN2OCRT = STN2OAN / (STGENACY / 1000).

36. State Annual Hg Combustion Output Emission Rate (STHGCRT) –
This field, in lb/BBtu, is calculated as follows:
STHGCRT = STHGAN / (STGENACY / 1000).

37. State Annual NO_x Coal Output Emission Rate (STCNOXRT) –
This field, in lb/MWh, is calculated as the sum of the annual NO_x emissions from all plants in the state that have coal as its primary fuel (PLPRMFL) divided by the sum of the annual combustion net generation from the same set of plants, and multiplied by a unit conversion factor. The methodology is new, beginning with year 2009 data, for all the fuel-based output emission rates.

38. State Annual NO_x Oil Output Emission Rate (STONOXRT) –
This field, in lb/MWh, is calculated as the sum of the annual NO_x emissions from all plants in the state that have oil as its primary fuel (PLPRMFL) divided by the sum of the annual combustion net generation from the same set of plants, and multiplied by a unit conversion factor. The methodology is new, beginning with year 2009 data, for all the fuel-based output emission rates.

39. State Annual NO_x Gas Output Emission Rate (STGNOXRT) –
This field, in lb/MWh, is calculated as the sum of the annual NO_x emissions from all plants in the state that have natural gas as its primary fuel (PLPRMFL) divided by the sum of the annual combustion net generation from the same set of plants, and multiplied by a unit conversion factor. The methodology is new, beginning with year 2009 data, for all the fuel-based output emission rates.

40. State Annual NO_x Fossil Fuel Output Emission Rate (STFSNXRT) –
This field, in lb/MWh, is calculated as the sum of the annual NO_x emissions from all plants in the state that have a fossil fuel (coal, oil, gas**,** or other fossil) as its primary fuel (PLPRMFL) divided by the sum of the annual combustion net generation from the same set of plants, and multiplied by a unit conversion factor. The methodology is new, beginning with year 2009 data, for all the fuel-based output emission rates.

41. - 44. State Ozone Season NO_x Coal, Oil, Gas, and Fossil Fuel Output Emission Rates –
The descriptions of these fields, in lb/MWh, contain the same information for ozone season NO_x as fields #37 through #40, respectively, do for annual NO_x. The state ozone season combustion net generation, used in the denominator of the equations used to calculate these state fuel-based output emission rates is calculated as the ratio of the state annual to ozone season net generation for that fuel times the state annual combustion net generation. The methodology is new, beginning with year 2009 data, for all the fuel-based output emission rates.

45. - 48. State Annual SO_2 Coal, Oil, Gas, and Fossil Fuel Output Emission Rates –
The descriptions of these fields, in lb/MWh, contain the same information for annual SO_2 as fields #37 through #40, respectively, do for annual NO_x.

49. - 52. State Annual CO_2 Coal, Oil, Gas, and Fossil Fuel Output Emission Rates –
The descriptions of these fields, in lb/MWh, contain the same information for annual CO_2 as fields #37 through #40, respectively, do for annual NO_x.

53. - 54. State Annual Hg Coal and Fossil Fuel Output Emission Rates –
The descriptions of these fields, in lb/GWh, contain the same information for annual Hg as fields #37 and #40, respectively, do for annual NO_x.

55. - 72. State Annual NO_x, Ozone Season NO_x, Annual SO_2, Annual CO_2 Coal, Oil, Gas, and Fossil Fuel Input Emission Rates; and Annual Hg Coal and Fossil Fuel Input Emission Rates –
The description of these fields, primary fuel-specific input emission rates, contains the same information that fields #37 through #54 do for primary fuel-specific output emission rates – except that the calculations include heat input, rather than net generation. Note that for Hg input emission rates, the units are lb/BBtu, not lb/MMBtu. These values are calculated in the same manner as are any input emission rates.

73. State Annual NO_x Non-baseload Output Emission Rate (STNBNOX) –
This field, in lb/MWh, is the sum of the annual non-baseload NO_x emissions divided by the sum of annual non-baseload net generation in the state and then multiplied by a unit conversion factor. This field is intended to provide a more refined estimate of avoided emissions than the fossil-fuel average output emission rate. The non-baseload emissions and generation include only emissions and generation from combustion sources and exclude emissions and generation from plants that have high capacity factors. The remaining emissions and generation are weighted by a factor which is a function of capacity factor. For more information, see the Methodology Section.

74. State Ozone Season NO_x Non-baseload Output Emission Rate (STNBNXO) –
The description of this field, in lb/MWh, contains the same information as field #73 does, but for the ozone season.

75. **State Annual SO_2 Non-baseload Output Emission Rate (STNBSO2) –**
The description of this field, as well as fields #76 through #79, in lb/MWh, contain the same information as field #73 does, but for the appropriate pollutant.

76. **State Annual CO_2 Non-baseload Output Emission Rate (STNBCO2) –**

77. **State Annual CH_4 Non-baseload Output Emission Rate (STNBCH4) –**

78. **State Annual N_2O Non-baseload Output Emission Rate (STNBN2O) –**

79. **State Annual Hg Non-baseload Output Emission Rate (STNBHG) –**

80. **State Annual Coal Net Generation (STGENACL) –**

81. **State Annual Oil Net Generation (STGENAOL) –**

82. **State Annual Gas Net Generation (STGENAGS) –**

83. **State Annual Nuclear Net Generation (STGENANC) –**

84. **State Annual Hydro Net Generation (STGENAHY) –**

85. **State Annual Biomass Net Generation (STGENABM) –**

86. **State Annual Wind Net Generation (STGENAWI) –**

87. **State Annual Solar Net Generation (STGENASO) –**

88. **State Annual Geothermal Net Generation (STGENAGT) –**

89. **State Annual Other Fossil Net Generation (STGENAOF) –**

90. **State Annual Other Unknown/Purchased Fuel Net Generation (STGENAOP) –**

91. **State Annual Total Nonrenewables Net Generation (STGENATN) –**

92. **State Annual Total Renewables Net Generation (STGENATR) –**

93. **State Annual Total Nonhydro Renewables Net Generation (STGENATH) –**

94. **State Annual Total Combustion Net Generation (STGENACY) –**

95. **State Annual Total Noncombustion Net Generation (STGENACN) –**

96. **State Coal Generation Percent (STCLPR) –**

97. **State Oil Generation Percent (STOLPR) –**

98. **State Gas Generation Percent (STGSPR) –**

99. **State Nuclear Generation Percent (STNCPR) –**

100. State Hydro Generation Percent (STHYPR) –

101. State Biomass Generation Percent (STBMPR) –

102. State Wind Generation Percent (STWIPR) –

103. State Solar Generation Percent (STSOPR) –

104. State Geothermal Generation Percent (STGTPR) –

105. State Other Fossil Generation Percent (STOFPR) –

106. State Other Unknown/Purchased Fuel Generation Percent (STOPPR) –

107. State Total Nonrenewables Generation Percent (STTNPR) –

108. State Total Renewables Generation Percent (STTRPR) –

109. State Total Nonhydro Renewables Generation Percent (STTHPR) –

110. State Total Combustion Generation Percent (STCYPR) –

111. State Total Noncombustion Generation Percent (STCNPR) –

E. THE PCAL (PCA) FILE

There are 111 variables in the fifth file, PCAL, which contains location (operator)-based power control area (PCA) data. All generation and emission values are derived by aggregating from the plant level based on the associated PCA.

The one new variable for this data year is the year 2009 sequence number. There are no other variables that have not been described in previous file variable descriptions. Aggregated variable names generally begin with "PC."

F. THE SRL (eGRID SUBREGION) FILE

There are 113 variables in the sixth file, SRL, which contains location (operator-based) eGRID subregions. All generation and emission values are derived by aggregating from the plant level based on the associated eGRID subregion.

One new variable added to this file in eGRID2012 is the eGRID subregion annual CO_2 equivalent non-baseload output emission rate (SRNBC2ER). The other new variable for this data year is the year 2009 sequence number. There are no other variables that have not been described in previous file variable descriptions. Aggregated variable names generally begin with "SR."

G. THE NRL (NERC REGION) FILE

There are 111 variables in the seventh file, NRL, which contains location (operator)-based NERC region data. All generation and emission values are derived by aggregating from the plant level based on the associated NERC region.

The only variable in this file that has not been described in a previous file variable description is NERCNAME, the NERC region name associated with the NERC region acronym (see subsection E.1. of the Methodology Section). The other new variable for this data year is the year 2009 sequence number. Aggregated variable names generally begin with "NR."

H. THE US (U.S.) FILE

There are 109 variables in the eighth file, US, which contains data for the entire United States. All generation and emission values are derived by aggregating from the plant level. The one new variable for this data year is the year 2009 sequence number. There are no other variables that have not been described in previous file variable descriptions. Aggregated variable names generally begin with "US."

I. THE REGIONAL GRID GROSS LOSS FILE

There are seven variables in this newly added ninth file, GGL, for year 2009 data. The grid gross loss values can be used when applying eGRID GHG factors (eGRID subregion annual GHG total output emission rates) to consumption. Specifically, to account for indirect emissions associated with consumption of electricity (both from generation and from transmission and distribution line losses) divide the product of the electricity consumption and the generation based eGRID total output emission rates by (one minus the grid gross loss as a decimal). See the equation below:

GHG emis cons = GHG emis rate * Consumption /(1-ggl%/100)/2000;

where

GHG emis cons	=	a specified GHG emission associated with a certain amount of electricity consumption (generation and line losses) in tons,
GHG emis rate	=	eGRID subregion annual total output emission rate in lb/MWh for a specified GHG,
Consumption	=	the given electricity consumption in MWh (= kWh/1000), and
Ggl%	=	the estimated regional grid gross loss as a percent.

If reporting the indirect emissions for the electricity generation (scope 2 emissions) separately from the indirect emissions as a result of transmission and distribution line losses (scope 3 emissions), then the scope 2 emissions are simply the consumption in MWh multiplied by the eGRID subregion annual total output emission rate in lb/MWh, and the scope 3 emissions are calculated in the following equation:

GHG emis ll = GHG emis rate * Consumption * (ggl%/100) / (1-ggl%/100)/2000;

where

GHG emis ll	=	a specified GHG emission associated with the line losses of a certain amount of electricity consumption in tons,
GHG emis rate	=	eGRID subregion annual total output emission rate in lb/MWh for a specified GHG,
Consumption	=	the given electricity consumption in MWh (= kWh/1000), and
Ggl%	=	the estimated regional grid gross loss as a percent.

The variables in the regional grid gross loss file are as follows:

1. REGION –
This field is one of the three interconnect power grids in the U.S. (plus Alaska, Hawaii, and the entire U.S.)

2. GENERAT –
The field is the regional total net generation in MWh. These data originally are at the PCA level plus MISO and are subsequently summed to the power grid region.
Source: 2009 FERC-714, eGRID2012 year 2009 net generation (for Alaska and Hawaii)

3. FRGNINTC –
This field is the regional total net interchange in MWh with Canada and Mexico. These data originally are at the PCA level plus MISO and are subsequently summed to the power grid region. Note that imports will have a positive value.
Source: 2009 FERC-714 updated by EIA

4. INTRCHNG –
This field is the regional total net interchange (= generation imported - generation exported) in MWh with a different U.S. region. These data originally are at the PCA level plus MISO and are subsequently summed to the power grid region. Note that imports will have a positive value.
Source: 2009 FERC-714 + updates

5 CONSUMP –
This field is the regional total consumption in MWh. Consumption is the sum of total retail sales to ultimate customers, energy furnished without charge, and energy consumed

by the respondent without charge. These data, originally at the utility service territory level, are subsequently summed to the power grid region.
Source: 2009 EIA-861 Files 1 and 2 + updates

6. **GGRSLOSS –**
This field is the estimated grid gross loss as a percent. The algorithm used is
GGRLOSS = (100 * (GENERAT + FRGNINTC + INTRCHNG - CONSUMP) / GENERAT).
The grid gross loss values are also included in Table III-4.

7. **YEAR –**
This field is the year of data.

SECTION VI. REFERENCES

Brighter Planet, 2010: Brighter Planet, Electricity Use carbon model, 2010. http://brighterplanet.github.com/electricity_use/impact_model.html

CARB, 2007: California Air Resources Board "Regulation for the Mandatory Reporting of Greenhouse Gas Emissions (AB 32 requirements)" Table 5 in Appendix A, December 2007. http://www.arb.ca.gov/regact/2007/ghg2007/frofinoal.pdf

Diem, Rothschild, and Quiroz, 2011: Diem, A., S. Rothschild, and C. Quiroz, "eGRID: An Efficient Way to Value the GHG Emissions Reduction Effects of Energy Efficiency," a paper accompanying the poster presentation at the International Energy Program Evaluation Conference, Boston, MA, August 2011.

Diem, Rothschild, and Quiroz, 2012a: Diem, A., S. Rothschild, and C. Quiroz, "eGRID Data for Carbon Footprinting Electricity Purchases," presented at EUEC 2012 Environmental Conference, Phoenix, AZ, January 2012.

Diem, Rothschild, and Quiroz, 2012b: Diem, A., S. Rothschild, and C. Quiroz, "When to Use Which eGRID Data Year of GHG Emission Factors: Several Scenarios Presented" to be presented at the U.S. Environmental Protection Agency 2012 International Emission Inventory Conference, Tampa, Florida, August 2012 (forthcoming).

DVRPC, 2010: Delaware Valley Regional Planning Commission, Regional Greenhouse Gas Emissions Inventory, revised December 2010. http://www.dvrpc.org/reports/09038A.pdf

DOE, 2003: U.S. Department of Energy, *Gas-Fired Distributed Energy Resource Technology Characterizations*, November 2003. http://www.nrel.gov/docs/fy04osti/34783.pdf

EEA, 2011 updated: Energy and Environmental Analysis, an ICF International Company, "Combined Heat and Power Installation Database, maintained for DOE ORNL," Washington, DC, 2011, updated. http://www.eea-inc.com/chpdata/index.html

EIA, 2000: Energy Information Administration, The Main Interconnections of the U.S. Electric Power Grid and the 10 North American Electric Reliability Council Regions in "The Changing Structure of the Electric Power Industry 2000: An Update (Figure 7)", October 2000. http://www.eia.gov/cneaf/electricity/chg_stru_update/fig7.html

EIA, 2007: Energy Information Administration. Tables B1 and B2, http://www.eia.doe.gov/cneaf/solar.renewables/page/mswaste/msw.pdf . Tables and updates based on EIA-EPA email exchanges from October 23, 2007 through November 15, 2007.

EIA, 2011a: Energy Information Administration, "2009 Annual Electric Generator Report," Form EIA-860, Washington, DC, 2011. http://www.eia.gov/cneaf/electricity/page/eia860.html

EIA, 2011b: Energy Information Administration, "2009 Annual Electric Power Industry Report," Form EIA-861, Washington, DC, 2011. http://www.eia.gov/cneaf/electricity/page/eia861.html

EIA, 2011c: Energy Information Administration, "2009 Power Plant Operations Report," Form EIA-923, Washington, DC, 2011. http://www.eia.gov/cneaf/electricity/page/eia906_920.html

EIA, 2011d: Energy Information Administration, The Electricity Module of the National Energy Modeling System Model Documentation Report (Figure 3), July 2011. ftp://ftp.eia.doe.gov/modeldoc/m068(2011).pdf

EIA, 2011e: Energy Information Administration, "Plant Coordinates (2010), attached file from EIA's Stan Kaplan, December 6, 2011.

EPA, 2002: U.S. Environmental Protection Agency, "Large Municipal Waste Combustor 2000 Database," 2002.

EPA, 2009: U.S. Environmental Protection Agency, Final Mandatory Reporting of Greenhouse Gases Rule (Tables C-1 and C-2), Washington, D.C., October 30, 2009. http://www.epa.gov/climatechange/emissions/downloads09/GHG-MRR-Full%20Version.pdf

EPA, 2011a: U.S. Environmental Protection Agency, 2009 Annual and Ozone Season EPA/CAMD database, Washington, DC, downloaded October 31, 2011 from http://camddataandmaps.epa.gov/gdm/.

EPA, 2011b: U.S. Environmental Protection Agency, Apps for the Environment, November 2011. http://www.epa.gov/appsfortheenvironment/

EPA, 2012a: U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42 – uncontrolled criteria pollutant emission factors (EF) with EPA-approved updates, February 2012.

EPA, 2012b: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*, Washington, D.C., April 2012. http://epa.gov/climatechange/emissions/usinventoryreport.html

EPA, undated1: U.S. Environmental Protection Agency's EPA CHP Partnership, *Catalogue of CHP Technologies*. http://www.epa.gov/chp/documents/catalog_chptech_full.pdf (updated link)

EPA, undated2: U.S. Environmental Protection Agency, RACT/BACT/LAER Clearinghouse. Washington, DC. http://cfpub1.epa.gov/RBLC/

FERC, 2011: Federal Energy Regulatory Commission, Form FERC-714 year 2009 data. Obtained from EIA on July 6, 2011.

Galvin, 2011: Galvin Electricity Initiative, Perfect Power Seal of Approval: Metrics and Scoring System (beta version), April 20, 2011.

GEA, 2007: Alyssa Kagel, Diana Bates, and Karl Gawell. Table 3, Air Emissions Summary, in "A Guide to Geothermal Energy and the Environment", Geothermal Energy Association, Washington, D.C., April 2007. http://geo-energy.org/reports/Environmental%20Guide.pdf

GEA, 2010: Geothermal generator type from state-plant information displayed on the Geothermal Energy Association website, http://www.geo-energy.org/, Washington, D.C., August 2010.

IPCC, 2007: The Intergovernmental Panel on Climate Change (IPCC), "2006 IPCC Guidelines for National Greenhouse Gas Inventories", volume 2 (Energy), April 2007. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf

Maryland, 2010: Maryland Department of the Environment, Technical Support Document for Amendments to COMAR 26.09 MD CO_2 Budget Training Program, Baltimore, MD, October 25, 2010. http://www.mde.state.md.us/aboutmde/AboutMDEHome/Documents/RGGI-VERSA_TSD.PDF

NERC, 2012a: "Currently Registered BAs in NERC Compliance Registry as of March 28, 2012" Excel spreadsheet. Downloaded NERC_Compliance_Registry_Matrix_Excel20120328.xls from http://www.nerc.com/page.php?cid=3|25 .

NERC, 2012b: North American Electric Reliability Corporation, NERC Regions map, http://www.nerc.com/fileUploads/File/AboutNERC/maps/NERC_Regions_color.jpg.

NIST, undated: National Institute of Standards and Technology, Federal Information Processing Standards Publications. http://www.itl.nist.gov/fipspubs/index.htm.

Rothschild and Diem, 2009: Rothschild, S. and A. Diem, 2009. "Total, Non-baseload, eGRID Subregion, State? Guidance on the Use of eGRID Output Emission Rates," presented at the U.S. Environmental Protection Agency Emission Inventory Conference, Baltimore, MD, May 2009. http://www.epa.gov/ttn/chief/conference/ei18/session5/rothschild.pdf

Rothschild, Diem, Quiroz, Salhotra, 2010: Rothschild, S, A. Diem, C. Quiroz, and M. Salhotra, 2010. "The Value of eGRID and eGRIDweb to GHG Inventories," presented at EUEC 2010 Environmental Conference, Phoenix, AZ, February 2010. http://www.epa.gov/cleanenergy/documents/egridzips/The_Value_of_eGRID_Dec_2009.pdf

TCR, 2012: The Climate Registry updated emission factor file, January 6, 2012.

TS|Pechan, 2003a: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2002 (eGRID2002) Version 2.1 Technical Support Document," prepared for the U.S. Environmental Protection Agency, Acid Rain Division, Washington, DC, May 2003.

TS|Pechan, 2003b: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2002 (eGRID2002) Version 2.1 Users Manual," prepared for the U.S. Environmental Protection Agency, Acid Rain Division, Washington, DC, April 2003.

TS|Pechan, 2007: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2006 (eGRID2006) Technical Support Document," prepared for the U.S. Environmental Protection Agency, Climate Protection Partnership Division, Washington, DC, May 2007.

TS|Pechan, 2008: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2007 (eGRID2007) Technical Support Document," prepared for the U.S. Environmental Protection Agency, Climate Protection Partnership Division, Washington, DC, September 2008.

TS|Pechan, 2009: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database eGRIDweb Version 1.0 Users Manual," prepared for U.S. Environmental Protection Agency, Washington, DC, April 2009.

TS|Pechan, 2010: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2010 (eGRID2010) Technical Support Document," prepared for the U.S. Environmental Protection Agency, Acid Rain Division, Washington, DC, December 2010.

TS|Pechan, 2012: TranSystems|E.H. Pechan, "The Emissions & Generation Resource Integrated Database for 2012 (eGRID2012) Technical Support Document," prepared for the U.S. Environmental Protection Agency, Acid Rain Division, Washington, DC, April 2012.

UCS, 2012: Union of Concerned Scientists, "State of Charge: Electric Vehicles' Global Warming Emissions and Fuel-Cost Savings Across the United States, April 2012. http://www.ucsusa.org/clean_vehicles/technologies_and_fuels/hybrid_fuelcell_and_electric_vehicles/emissions-and-charging-costs-electric-cars.html?utm_source=SP&utm_medium=head&utm_campaign=EV%2BReport

Ventyx, 2007: Ventyx' Global Energy Decisions' Velocity Suites 2006 data, downloaded on a trial basis with company permission, October-November 2007.

WECC, 2007: "Existing Generation and Significant Additions and Changes to System Facilities (2006 -2016) Data as of January 1, 2007," prepared by WECC staff, downloaded as SIGADD07Final.pdf on May 18, 2010 at http://www.wecc.biz/committees/StandingCommittees/PCC/LRS/Shared%20Documents/LRS%20Reports/Year%202007/SIGADD07Final.pdf.

Wheeler, 2007: David Wheeler, Senior Fellow, Center for Global Development, CARMA developer, personal communication, November 30, 2007.

APPENDIX A. eGRID2012 FILE STRUCTURE - VARIABLE DESCRIPTIONS FOR 2009 DATA YEAR

The year 2009 data for eGRID2012 are initially in database format and are then transformed into Excel spreadsheets. The structure of the nine database files – including descriptions of the variables, *unit of measurement*, and original source(s) of data – are delineated below in the file structure. NOTE: *Italics indicates new field*; **bold indicates methodological change.**

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 BLR Boiler File*

Field	Name	Description	Unit	Source(s)
1	*SEQBLR09*	*eGRID2012 year 2009 file boiler sequence number*		
2	PSTATABB	Plant state abbreviation		EIA-860
3	PNAME	Plant name		EIA-860 + updates
4	ORISPL	DOE/EIA ORIS plant or facility code		EIA-860 + updates
5	BLRID	Boiler ID		EPA/CAMD, EIA-923
6	ARPFLAG	Acid Rain Program flag: 1 = Yes		EPA/CAMD
7	*PRGCODE*	*Program code(s)*		*EPA/CAMD*
8	BOTFIRTY	Boiler bottom and firing type		EPA/CAMD, EIA-860
9	NUMGEN	Number of associated generators		EIA-860
10	FUELB1	Boiler primary fuel		EPA/CAMD, EIA-923
11	HRSOP	Unit operating hours	hours	EPA/CAMD
12	HTIEAN	Boiler unadjusted annual EPA/CAMD heat input	MMBtu	EPA/CAMD
13	HTIEOZ	Boiler unadjusted ozone season EPA/CAMD heat input	MMBtu	EPA/CAMD
14	HTIFAN	Boiler unadjusted annual total EIA-based calculated heat input	MMBtu	EIA-923
15	HTIFOZ	Boiler unadjusted ozone season EIA-based calculated heat input	MMBtu	EIA-923
16	NOXEAN	Boiler unadjusted annual EPA/CAMD NO_x emissions	tons	EPA/CAMD
17	NOXEOZ	Boiler unadjusted ozone season EPA/CAMD NO_x emissions	tons	EPA/CAMD
18	NOXFAN	Boiler unadjusted annual EIA-based calculated NO_x emissions	tons	EIA-923
19	NOXFOZ	Boiler unadjusted ozone season EIA-based calculated NO_x emissions	tons	EIA-923
20	SO2EAN	Boiler unadjusted annual EPA/CAMD SO_2 emissions	tons	EPA/CAMD
21	SO2FAN	Boiler unadjusted annual EIA-based calculated SO_2 emissions	tons	EIA-923
22	CO2EAN	Boiler unadjusted annual EPA/CAMD CO_2 emissions	tons	EPA/CAMD
23	CO2FAN	Boiler unadjusted annual EIA-based calculated CO_2 emissions	tons	EIA-923
24	SRCBEST	Source of “best” data from EPA/CAMD or EIA-923 boiler level		
25	HTIBAN	Boiler unadjusted annual best heat input	MMBtu	
26	HTIBOZ	Boiler unadjusted ozone season best heat input	MMBtu	
27	NOXBAN	Boiler unadjusted annual best NO_x emissions	tons	
28	NOXBOZ	Boiler unadjusted ozone season best NO_x emissions	tons	
29	SO2BAN	Boiler unadjusted annual best SO_2 emissions	tons	
30	CO2BAN	Boiler unadjusted annual best CO_2 emissions	tons	
31	SO2CTLDV	Boiler SO_2 (scrubber) first control device		EPA/CAMD, EIA-860
32	NOXCTLDV	Boiler NO_x first control device		EPA/CAMD, EIA-860
33	HGCTLDV	Boiler Hg activated carbon injection system flag: 1 = Yes		EIA-860
34	BLRYRONL	Boiler year on-line		EPA/CAMD, EIA-860

*Note that summing the boiler unadjusted emissions to the plant level may not result in the same values as the plant unadjusted emissions since additional emissions from prime movers not covered by the EPA/CAMD or EIA-923 boiler level data may be included in the plant emissions values.

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 GEN Generator File**

Field	Name	Description	Unit	Source(s)
1	*SEQGEN09*	*eGRID2012 year 2009 file generator sequence number*		
2	PSTATABB	Plant state abbreviation		EIA-860
3	PNAME	Plant name		EIA-860 + updates
4	ORISPL	DOE/EIA ORIS plant or facility code		EIA-860 + updates
5	GENID	Generator ID		EIA-860
6	NUMBLR	Number of associated boilers		EIA-860
7	GENSTAT	Generator status		EIA-860
8	PRMVR	Generator prime mover type		EIA-860
9	FUELG1	Generator primary fuel		EIA-860
10	NAMEPCAP	Generator nameplate capacity	MW	EIA-860
11	CFACT	Generator capacity factor		
12	GENNTAN	Generator annual net generation	MWh	EIA-923
13	GENNTOZ	Generator ozone season net generation	MWh	EIA-923
14	GENERSRC	Generation data source		
15	GENYRONL	Generator year on-line		EIA-860

**Note that summing the generator generation to the plant level may not result in the same values as the plant generation. This file includes generation from nuclear units in the EIA-923, steam generators in the unit-level EIA-923, and those plant-prime movers in the EIA-923 that have only one generator in the EIA-860.

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PLNT Plant File

Field	Name	Description	Unit	Source(s)
1	*SEQPLT09*	*eGRID2012 year 2009 file plant sequence number*		
2	PSTATABB	Plant state abbreviation		EIA-860
3	PNAME	Plant name		EIA-860 + updates
4	ORISPL	DOE/EIA ORIS plant or facility code		EIA-860 + updates
5	FRSID	Plant EPA Facility Registry System (FRS) identification code		EPA FRS
6	OPRNAME	Plant operator name		EIA-860
7	OPRCODE	Plant operator ID		EIA-860
8	UTLSRVNM	Utility service territory name		EIA-860 + updates
9	UTLSRVID	Utility service territory ID		EIA-860 + updates
10	OPPRNUM	ID of the operator's parent company		
11	OPPRNAME	Name of the operator's parent company		
12	PCANAME	Power control area name		NERC, EIA-861 + updates
13	PCAID	Power control area ID		NERC, EIA-861 + updates
14	NERC	NERC region acronym		NERC
15	SUBRGN	eGRID subregion acronym		EPA
16	SRNAME	eGRID subregion name		EPA
17	*ISORTO*	*Plant associated ISO/RTO Territory*		*EIA-860 (2010) + updates*
18	FIPSST	Plant FIPS state code		NIST based
19	FIPSCNTY	Plant FIPS county code		NIST based
20	CNTYNAME	Plant county name		EIA-860, EPA/CAMD
21	LAT	Plant latitude		EPA/CAMD, EIA + updates
22	LON	Plant longitude		EPA/CAMD, EIA + updates
23	CCFLAG	County centroid flag: 1 = County centroid used		
24	NUMBLR	Number of boilers		EPA/CAMD, EIA-860 calculated
25	NUMGEN	Number of generators		EIA-860 calculated
26	COMBUST	Plant combustion status: 1 = Combusts, 0 = No combustion, 0.5 = Partial combustion		
27	SOURCEM	Plant emissions source(s): EPA or EIA-923		
28	PLPRMFL	Plant primary fuel		
29	PLFUELCT	Plant primary coal/oil/gas/other fossil fuel category		
30	PLPFGNCT	Plant primary fuel generation category		
31	COALFLAG	Flag indicating if the plant burned or generated any amount of coal: 1 = Yes		
32	CAPFAC	Plant capacity factor		
33	NAMEPCAP	Plant nameplate capacity	MW	EIA-860 summed
34	RMBMFLAG	Biogas/biomass plant adjustment flag: 0 = No biomass; 1 = Biogas included; 100 = Other biomass included; 71 = CAMD emissions biogas adjustments; 7100 = CAMD CO_2 biomass adjustment		
35	CHPFLAG	Combined heat and power (CHP) plant adjustment flag: 1 = Yes		eGRID CHP List
36	USETHRMO	CHP plant useful thermal output	MMBtu	EIA-923 calculated
37	PWRTOHT	CHP plant power to heat ratio		
38	ELCALLOC	CHP plant electric allocation factor		
39	PSFLAG	Plant pumped storage flag: 1 = Yes		EIA-860
40	PLHTIAN	Plant annual heat input	MMBtu	
41	PLHTIOZ	Plant ozone season heat input	MMBtu	
42	PLNGENAN	Plant annual net generation	MWh	EIA-923, EPA/CAMD calculated

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PLNT Plant File (continued).

Field	Name	Description	Unit	Source(s)
43	PLNGENOZ	Plant ozone season net generation	MWh	EIA-923, EPA/CAMD calculated
44	PLNOXAN	Plant annual NO_x emissions	tons	
45	PLNOXOZ	Plant ozone season NO_x emissions	tons	
46	PLSO2AN	Plant annual SO_2 emissions	tons	
47	PLCO2AN	Plant annual CO_2 emissions	tons	
48	PLCH4AN	Plant annual CH_4 emissions	lbs	
49	PLN2OAN	Plant annual N_2O emissions	lbs	
50	PLCO2EQA	Plant annual CO_2 equivalent emissions ((1 * PLCO2AN) + (21 * PLCH4AN/2000) + (310 * PLN2OAN/2000))	tons	
51	PLHGAN	Plant annual Hg emissions	lbs	
52	PLNOXRTA	Plant annual NO_x total output emission rate	lb/MWh	
53	PLNOXRTO	Plant ozone season NO_x total output emission rate	lb/MWh	
54	PLSO2RTA	Plant annual SO_2 total output emission rate	lb/MWh	
55	PLCO2RTA	Plant annual CO_2 total output emission rate	lb/MWh	
56	PLCH4RTA	Plant annual CH_4 total output emission rate	lb/GWh	
57	PLN2ORTA	Plant annual N_2O total output emission rate	lb/GWh	
58	PLC2ERTA	Plant annual CO_2 equivalent total output emission rate	lb/MWh	
59	PLHGRTA	Plant annual Hg total output emission rate	lb/GWh	
60	PLNOXRA	Plant annual NO_x input emission rate	lb/MMBtu	
61	PLNOXRO	Plant ozone season NO_x input emission rate	lb/MMBtu	
62	PLSO2RA	Plant annual SO_2 input emission rate	lb/MMBtu	
63	PLCO2RA	Plant annual CO_2 input emission rate	lb/MMBtu	
64	PLHGRA	Plant annual Hg input emission rate	lb/BBtu	
65	PLNOXCRT	Plant annual NO_x combustion output emission rate	lb/MWh	
66	PLNOXCRO	Plant ozone season NO_x combustion output emission rate	lb/MWh	
67	PLSO2CRT	Plant annual SO_2 combustion output emission rate	lb/MWh	
68	PLCO2CRT	Plant annual CO_2 combustion output emission rate	lb/MWh	
69	PLCH4CRT	Plant annual CH_4 combustion output emission rate	lb/GWh	
70	PLN2OCRT	Plant annual N_2O combustion output emission rate	lb/GWh	
71	PLHGCRT	Plant annual Hg combustion output emission rate	lb/GWh	
72	UNNOX	Plant unadjusted annual NO_x emissions	tons	
73	UNNOXOZ	Plant unadjusted ozone season NO_x emissions	tons	
74	UNSO2	Plant unadjusted annual SO_2 emissions	tons	
75	UNCO2	Plant unadjusted annual CO_2 emissions	tons	
76	UNCH4	Plant unadjusted annual CH_4 emissions	lbs	
77	UNN2O	Plant unadjusted annual N_2O emissions	lbs	
78	UNHG	Plant unadjusted annual Hg emissions	lbs	
79	UNHTI	Plant unadjusted annual heat input	MMBtu	EPA/CAMD, EIA-923
80	UNHTIOZ	Plant unadjusted ozone season heat input	MMBtu	EPA/CAMD, EIA-923
81	PLHTRT	Plant nominal heat rate	Btu/kWh	
82	PLGENACL	Plant annual coal net generation	MWh	
83	PLGENAOL	Plant annual oil net generation	MWh	
84	PLGENAGS	Plant annual gas net generation	MWh	
85	PLGENANC	Plant annual nuclear net generation	MWh	
86	PLGENAHY	Plant annual hydro net generation	MWh	
87	PLGENABM	Plant annual biomass net generation	MWh	
88	PLGENAWI	Plant annual wind net generation	MWh	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PLNT Plant File (continued).

Field	Name	Description	Unit	Source(s)
89	PLGENASO	Plant annual solar net generation	MWh	
90	PLGENAGT	Plant annual geothermal net generation	MWh	
91	PLGENAOF	Plant annual other fossil net generation	MWh	
92	PLGENAOP	Plant annual other unknown/purchased fuel net generation	MWh	
93	PLGENATN	Plant annual total nonrenewables net generation	MWh	
94	PLGENATR	Plant annual total renewables net generation	MWh	
95	PLGENATH	Plant annual total nonhydro renewables net generation	MWh	
96	PLGENACY	Plant annual total combustion net generation	MWh	
97	PLGENACN	Plant annual total noncombustion net generation	MWh	
98	PLCLPR	Plant coal generation percent (resource mix)		
99	PLOLPR	Plant oil generation percent (resource mix)		
100	PLGSPR	Plant gas generation percent (resource mix)		
101	PLNCPR	Plant nuclear generation percent (resource mix)		
102	PLHYPR	Plant hydro generation percent (resource mix)		
103	PLBMPR	Plant biomass generation percent (resource mix)		
104	PLWIPR	Plant wind generation percent (resource mix)		
105	PLSOPR	Plant solar generation percent (resource mix)		
106	PLGTPR	Plant geothermal generation percent (resource mix)		
107	PLOFPR	Plant other fossil generation percent (resource mix)		
108	PLOPPR	Plant other unknown/purchased fuel generation percent (resource mix)		
109	PLTNPR	Plant total nonrenewables generation percent (resource mix)		
110	PLTRPR	Plant total renewables generation percent (resource mix)		
111	PLTHPR	Plant total nonhydro renewables generation percent (resource mix)		
112	PLCYPR	Plant total combustion generation percent (resource mix)		
113	PLCNPR	Plant total noncombustion generation percent (resource mix)		
114	OWNRNM01	Plant owner name (first)		EIA-860
115	OWNRUC01	Plant owner code (first)		EIA-860
116	OWNRPR01	Plant owner percent (first)		EIA-860
117	OWNRNM02	Plant owner name (second)		EIA-860
118	OWNRUC02	Plant owner code (second)		EIA-860
119	OWNRPR02	Plant owner percent (second)		EIA-860
120	OWNRNM03	Plant owner name (third)		EIA-860
121	OWNRUC03	Plant owner code (third)		EIA-860
122	OWNRPR03	Plant owner percent (third)		EIA-860
123	OWNRNM04	Plant owner name (fourth)		EIA-860
124	OWNRUC04	Plant owner code (fourth)		EIA-860
125	OWNRPR04	Plant owner percent (fourth)		EIA-860
126	OWNRNM05	Plant owner name (fifth)		EIA-860
127	OWNRUC05	Plant owner code (fifth)		EIA-860
128	OWNRPR05	Plant owner percent (fifth)		EIA-860
129	OWNRNM06	Plant owner name (sixth)		EIA-860
130	OWNRUC06	Plant owner code (sixth)		EIA-860
131	OWNRPR06	Plant owner percent (sixth)		EIA-860
132	OWNRNM07	Plant owner name (seventh)		EIA-860
133	OWNRUC07	Plant owner code (seventh)		EIA-860
134	OWNRPR07	Plant owner percent (seventh)		EIA-860

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PLNT Plant File (continued).

Field	Name	Description	Unit	Source(s)
135	OWNRNM08	Plant owner name (eighth)		EIA-860
136	OWNRUC08	Plant owner code (eighth)		EIA-860
137	OWNRPR08	Plant owner percent (eighth)		EIA-860
138	OWNRNM09	Plant owner name (ninth)		EIA-860
139	OWNRUC09	Plant owner code (ninth)		EIA-860
140	OWNRPR09	Plant owner percent (ninth)		EIA-860
141	OWNRNM10	Plant owner name (tenth)		EIA-860
142	OWNRUC10	Plant owner code (tenth)		EIA-860
143	OWNRPR10	Plant owner percent (tenth)		EIA-860
144	OWNRNM11	Plant owner name (eleventh)		EIA-860
145	OWNRUC11	Plant owner code (eleventh)		EIA-860
146	OWNRPR11	Plant owner percent (eleventh)		EIA-860
147	OWNRNM12	Plant owner name (twelfth)		EIA-860
148	OWNRUC12	Plant owner code (twelfth)		EIA-860
149	OWNRPR12	Plant owner percent (twelfth)		EIA-860
150	OWNRNM13	Plant owner name (thirteenth)		EIA-860
151	OWNRUC13	Plant owner code (thirteenth)		EIA-860
152	OWNRPR13	Plant owner percent (thirteenth)		EIA-860
153	OWNRNM14	Plant owner name (fourteenth)		EIA-860
154	OWNRUC14	Plant owner code (fourteenth)		EIA-860
155	OWNRPR14	Plant owner percent (fourteenth)		EIA-860
156	OWNRNM15	Plant owner name (fifteenth)		EIA-860
157	OWNRUC15	Plant owner code (fifteenth)		EIA-860
158	OWNRPR15	Plant owner percent (fifteenth)		EIA-860
159	OWNRNM16	Plant owner name (sixteenth)		EIA-860
160	OWNRUC16	Plant owner code (sixteenth)		EIA-860
161	OWNRPR16	Plant owner percent (sixteenth)		EIA-860 + updates EIA-860
162	SEQPLT04	eGRID2006 year 2004 file plant sequence number		
163	SEQPLT05	eGRID2007 year 2005 file plant sequence number		
164	SEQPLT07	eGRID2010 year 2007 file plant sequence number		

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 ST State File

Field	Name	Description	Unit
1	*SEQST09*	*eGRID2012 year 2009 file state sequence number*	
2	PSTATABB	State abbreviation	
3	FIPSST	FIPS state code	
4	NAMEPCAP	State nameplate capacity	MW
5	STHTIAN	State annual heat input	MMBtu
6	STHTIOZ	State ozone season heat input	MMBtu
7	STNGENAN	State annual net generation	MWh
8	STNGENOZ	State ozone season net generation	MWh
9	STNOXAN	State annual NO_x emissions	tons
10	STNOXOZ	State ozone season NO_x emissions	tons
11	STSO2AN	State annual SO_2 emissions	tons
12	STCO2AN	State annual CO_2 emissions	tons
13	STCH4AN	State annual CH_4 emissions	lbs
14	STN2OAN	State annual N_2O emissions	lbs
15	STCO2EQA	State annual CO_2 equivalent emissions	tons
16	STHGAN	State annual Hg emissions	lbs
17	STNOXRTA	State annual NO_x total output emission rate	lb/MWh
18	STNOXRTO	State ozone season NO_x total output emission rate	lb/MWh
19	STSO2RTA	State annual SO_2 total output emission rate	lb/MWh
20	STCO2RTA	State annual CO_2 total output emission rate	lb/MWh
21	STCH4RTA	State annual CH_4 total output emission rate	lb/GWh
22	STN2ORTA	State annual N_2O total output emission rate	lb/GWh
23	STC2ERTA	State annual CO_2 equivalent total output emission rate	lb/MWh
24	STHGRTA	State annual Hg total output emission rate	lb/GWh
25	STNOXRA	State annual NO_x input emission rate	lb/MMBtu
26	STNOXRO	State ozone season NO_x input emission rate	lb/MMBtu
27	STSO2RA	State annual SO_2 input emission rate	lb/MMBtu
28	STCO2RA	State annual CO_2 input emission rate	lb/MMBtu
29	STHGRA	State annual Hg input emission rate	lb/BBtu
30	STNOXCRT	State annual NO_x combustion output emission rate	lb/MWh
31	STNOXCRO	State ozone season NO_x combustion output emission rate	lb/MWh
32	STSO2CRT	State annual SO_2 combustion output emission rate	lb/MWh
33	STCO2CRT	State annual CO_2 combustion output emission rate	lb/MWh
34	STCH4CRT	State annual CH_4 combustion output emission rate	lb/GWh
35	STN2OCRT	State annual N_2O combustion output emission rate	lb/GWh
36	STHGCRT	State annual Hg combustion output emission rate	lb/GWh
37	STCNOXRT	State annual NO_x coal output emission rate	lb/MWh
38	STONOXRT	State annual NO_x oil output emission rate	lb/MWh
39	STGNOXRT	State annual NO_x gas output emission rate	lb/MWh
40	STFSNXRT	State annual NO_x fossil fuel output emission rate	lb/MWh
41	STCNXORT	State ozone season NO_x coal output emission rate	lb/MWh
42	STONXORT	State ozone season NO_x oil output emission rate	lb/MWh
43	STGNXORT	State ozone season NO_x gas output emission rate	lb/MWh
44	STFSNORT	State ozone season NO_x fossil fuel output emission rate	lb/MWh
45	STCSO2RT	State annual SO_2 coal output emission rate	lb/MWh
46	STOSO2RT	State annual SO_2 oil output emission rate	lb/MWh
47	STGSO2RT	State annual SO_2 gas output emission rate	lb/MWh
48	STFSS2RT	State annual SO_2 fossil fuel output emission rate	lb/MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 ST State File (continued).

Field	Name	Description	Unit
49	STCCO2RT	State annual CO_2 coal output emission rate	lb/MWh
50	STOCO2RT	State annual CO_2 oil output emission rate	lb/MWh
51	STGCO2RT	State annual CO_2 gas output emission rate	lb/MWh
52	STFSC2RT	State annual CO_2 fossil fuel output emission rate	lb/MWh
53	STCHGRT	State annual Hg coal output emission rate	lb/GWh
54	STFSHGRT	State annual Hg fossil fuel output emission rate	lb/GWh
55	STCNOXR	State annual NO_x coal input emission rate	lb/MMBtu
56	STONOXR	State annual NO_x oil input emission rate	lb/MMBtu
57	STGNOXR	State annual NO_x gas input emission rate	lb/MMBtu
58	STFSNXR	State annual NO_x fossil fuel input emission rate	lb/MMBtu
59	STCNXOR	State ozone season NO_x coal input emission rate	lb/MMBtu
60	STONXOR	State ozone season NO_x oil input emission rate	lb/MMBtu
61	STGNXOR	State ozone season NO_x gas input emission rate	lb/MMBtu
62	STFSNOR	State ozone season NO_x fossil fuel input emission rate	lb/MMBtu
63	STCSO2R	State annual SO_2 coal input emission rate	lb/MMBtu
64	STOSO2R	State annual SO_2 oil input emission rate	lb/MMBtu
65	STGSO2R	State annual SO_2 gas input emission rate	lb/MMBtu
66	STFSS2R	State annual SO_2 fossil fuel input emission rate	lb/MMBtu
67	STCCO2R	State annual CO_2 coal input emission rate	lb/MMBtu
68	STOCO2R	State annual CO_2 oil input emission rate	lb/MMBtu
69	STGCO2R	State annual CO_2 gas input emission rate	lb/MMBtu
70	STFSC2R	State annual CO_2 fossil fuel input emission rate	lb/MMBtu
71	STCHGR	State annual Hg coal input emission rate	lb/BBtu
72	STFSHGR	State annual Hg fossil fuel input emission rate	lb/BBtu
73	STNBNOX	State annual NO_x non-baseload output emission rate	lb/MWh
74	STNBNXO	State ozone season NO_x non-baseload output emission rate	lb/MWh
75	STNBSO2	State annual SO_2 non-baseload output emission rate	lb/MWh
76	STNBCO2	State annual CO_2 non-baseload output emission rate	lb/MWh
77	STNBCH4	State annual CH_4 non-baseload output emission rate	lb/GWh
78	STNBN2O	State annual N_2O non-baseload output emission rate	lb/GWh
79	STNBHG	State annual Hg non-baseload output emission rate	lb/GWh
80	STGENACL	State annual coal net generation	MWh
81	STGENAOL	State annual oil net generation	MWh
82	STGENAGS	State annual gas net generation	MWh
83	STGENANC	State annual nuclear net generation	MWh
84	STGENAHY	State annual hydro net generation	MWh
85	STGENABM	State annual biomass net generation	MWh
86	STGENAWI	State annual wind net generation	MWh
87	STGENASO	State annual solar net generation	MWh
88	STGENAGT	State annual geothermal net generation	MWh
89	STGENAOF	State annual other fossil net generation	MWh
90	STGENAOP	State annual other unknown/purchased fuel net generation	MWh
91	STGENATN	State annual total nonrenewables net generation	MWh
92	STGENATR	State annual total renewables net generation	MWh
93	STGENATH	State annual total nonhydro renewables net generation	MWh
94	STGENACY	State annual total combustion net generation	MWh
95	STGENACN	State annual total noncombustion net generation	MWh
96	STCLPR	State coal generation percent (resource mix)	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 ST State File (continued).

Field	Name	Description	Unit
97	STOLPR	State oil generation percent (resource mix)	
98	STGSPR	State gas generation percent (resource mix)	
99	STNCPR	State nuclear generation percent (resource mix)	
100	STHYPR	State hydro generation percent (resource mix)	
101	STBMPR	State biomass generation percent (resource mix)	
102	STWIPR	State wind generation percent (resource mix)	
103	STSOPR	State solar generation percent (resource mix)	
104	STGTPR	State geothermal generation percent (resource mix)	
105	STOFPR	State other fossil generation percent (resource mix)	
106	STOPPR	State other unknown/purchased fuel generation percent (resource mix)	
107	STTNPR	State total nonrenewables generation percent (resource mix)	
108	STTRPR	State total renewables generation percent (resource mix)	
109	STTHPR	State total nonhydro renewables generation percent (resource mix)	
110	STCYPR	State total combustion generation percent (resource mix)	
111	STCNPR	State total noncombustion generation percent (resource mix)	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PCAL File
Power Control Area (PCA) File

Field	Name	Description	Unit
1	*SEQPCL09*	*eGRID2012 year 2009 file PCA sequence number*	
2	PCAID	PCA ID	
3	PCANAME	PCA name	
4	NAMEPCAP	PCA nameplate capacity	MW
5	PCHTIAN	PCA annual heat input	MMBtu
6	PCHTIOZ	PCA ozone season heat input	MMBtu
7	PCNGENAN	PCA annual net generation	MWh
8	PCNGENOZ	PCA ozone season net generation	MWh
9	PCNOXAN	PCA annual NO_x emissions	tons
10	PCNOXOZ	PCA ozone season NO_x emissions	tons
11	PCSO2AN	PCA annual SO_2 emissions	tons
12	PCCO2AN	PCA annual CO_2 emissions	tons
13	PCCH4AN	PCA annual CH_4 emissions	lbs
14	PCN2OAN	PCA annual N_2O emissions	lbs
15	PCCO2EQA	PCA annual CO_2 equivalent emissions	tons
16	PCHGAN	PCA annual Hg emissions	lbs
17	PCNOXRTA	PCA annual NO_x total output emission rate	lb/MWh
18	PCNOXRTO	PCA ozone season NO_x total output emission rate	lb/MWh
19	PCSO2RTA	PCA annual SO_2 total output emission rate	lb/MWh
20	PCCO2RTA	PCA annual CO_2 total output emission rate	lb/MWh
21	PCCH4RTA	PCA annual CH_4 total output emission rate	lb/GWh
22	PCN2ORTA	PCA annual N_2O total output emission rate	lb/GWh
23	PCC2ERTA	PCA annual CO_2 equivalent total output emission rate	lb/MWh
24	PCHGRTA	PCA annual Hg total output emission rate	lb/GWh
25	PCNOXRA	PCA annual NO_x input emission rate	lb/MMBtu
26	PCNOXRO	PCA ozone season NO_x input emission rate	lb/MMBtu
27	PCSO2RA	PCA annual SO_2 input emission rate	lb/MMBtu
28	PCCO2RA	PCA annual CO_2 input emission rate	lb/MMBtu
29	PCHGRA	PCA annual Hg input emission rate	lb/BBtu
30	PCNOXCRT	PCA annual NO_x combustion output emission rate	lb/MWh
31	PCNOXCRO	PCA ozone season NO_x combustion output emission rate	lb/MWh
32	PCSO2CRT	PCA annual SO_2 combustion output emission rate	lb/MWh
33	PCCO2CRT	PCA annual CO_2 combustion output emission rate	lb/MWh
34	PCCH4CRT	PCA annual CH_4 combustion output emission rate	lb/GWh
35	PCN2OCRT	PCA annual N_2O combustion output emission rate	lb/GWh
36	PCHGCRT	PCA annual Hg combustion output emission rate	lb/GWh
37	PCCNOXRT	PCA annual NO_x coal output emission rate	lb/MWh
38	PCONOXRT	PCA annual NO_x oil output emission rate	lb/MWh
39	PCGNOXRT	PCA annual NO_x gas output emission rate	lb/MWh
40	PCFSNXRT	PCA annual NO_x fossil fuel output emission rate	lb/MWh
41	PCCNXORT	PCA ozone season NO_x coal output emission rate	lb/MWh
42	PCONXORT	PCA ozone season NO_x oil output emission rate	lb/MWh
43	PCGNXORT	PCA ozone season NO_x gas output emission rate	lb/MWh
44	PCFSNORT	PCA ozone season NO_x fossil fuel output emission rate	lb/MWh
45	PCCSO2RT	PCA annual SO_2 coal output emission rate	lb/MWh
46	PCOSO2RT	PCA annual SO_2 oil output emission rate	lb/MWh
47	PCGSO2RT	PCA annual SO_2 gas output emission rate	lb/MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PCAL File
Power Control Area (PCA) File (continued).

Field	Name	Description	Unit
48	PCFSS2RT	PCA annual SO_2 fossil fuel output emission rate	lb/MWh
49	PCCCO2RT	PCA annual CO_2 coal output emission rate	lb/MWh
50	PCOCO2RT	PCA annual CO_2 oil output emission rate	lb/MWh
51	PCGCO2RT	PCA annual CO_2 gas output emission rate	lb/MWh
52	PCFSC2RT	PCA annual CO_2 fossil fuel output emission rate	lb/MWh
53	PCCHGRT	PCA annual Hg coal output emission rate	lb/GWh
54	PCFSHGRT	PCA annual Hg fossil fuel output emission rate	lb/GWh
55	PCCNOXR	PCA annual NO_x coal input emission rate	lb/MMBtu
56	PCONOXR	PCA annual NO_x oil input emission rate	lb/MMBtu
57	PCGNOXR	PCA annual NO_x gas input emission rate	lb/MMBtu
58	PCFSNXR	PCA annual NO_x fossil fuel input emission rate	lb/MMBtu
59	PCCNXOR	PCA ozone season NO_x coal input emission rate	lb/MMBtu
60	PCONXOR	PCA ozone season NO_x oil input emission rate	lb/MMBtu
61	PCGNXOR	PCA ozone season NO_x gas input emission rate	lb/MMBtu
62	PCFSNOR	PCA ozone season NO_x fossil fuel input emission rate	lb/MMBtu
63	PCCSO2R	PCA annual SO_2 coal input emission rate	lb/MMBtu
64	PCOSO2R	PCA annual SO_2 oil input emission rate	lb/MMBtu
65	PCGSO2R	PCA annual SO_2 gas input emission rate	lb/MMBtu
66	PCFSS2R	PCA annual SO_2 fossil fuel input emission rate	lb/MMBtu
67	PCCCO2R	PCA annual CO_2 coal input emission rate	lb/MMBtu
68	PCOCO2R	PCA annual CO_2 oil input emission rate	lb/MMBtu
69	PCGCO2R	PCA annual CO_2 gas input emission rate	lb/MMBtu
70	PCFSC2R	PCA annual CO_2 fossil fuel input emission rate	lb/MMBtu
71	PCCHGR	PCA annual Hg coal input emission rate	lb/BBtu
72	PCFSHGR	PCA annual Hg fossil fuel input emission rate	lb/BBtu
73	PCNBNOX	PCA annual NO_x non-baseload output emission rate	lb/MWh
74	PCNBNXO	PCA ozone season NO_x non-baseload output emission rate	lb/MWh
75	PCNBSO2	PCA annual SO_2 non-baseload output emission rate	lb/MWh
76	PCNBCO2	PCA annual CO_2 non-baseload output emission rate	lb/MWh
77	PCNBCH4	PCA annual CH_4 non-baseload output emission rate	lb/GWh
78	PCNBN2O	PCA annual N_2O non-baseload output emission rate	lb/GWh
79	PCNBHG	PCA annual Hg non-baseload output emission rate	lb/GWh
80	PCGENACL	PCA annual coal net generation	MWh
81	PCGENAOL	PCA annual oil net generation	MWh
82	PCGENAGS	PCA annual gas net generation	MWh
83	PCGENANC	PCA annual nuclear net generation	MWh
84	PCGENAHY	PCA annual hydro net generation	MWh
85	PCGENABM	PCA annual biomass net generation	MWh
86	PCGENAWI	PCA annual wind net generation	MWh
87	PCGENASO	PCA annual solar net generation	MWh
88	PCGENAGT	PCA annual geothermal net generation	MWh
89	PCGENAOF	PCA annual other fossil net generation	MWh
90	PCGENAOP	PCA annual other unknown/purchased fuel net generation	MWh
91	PCGENATN	PCA annual total nonrenewables net generation	MWh
92	PCGENATR	PCA annual total renewables net generation	MWh
93	PCGENATH	PCA annual total nonhydro renewables net generation	MWh
94	PCGENACY	PCA annual total combustion net generation	MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 PCAL File
Power Control Area (PCA) File (continued).

Field	Name	Description	Unit
95	PCGENACN	PCA annual total noncombustion net generation	MWh
96	PCCLPR	PCA coal generation percent (resource mix)	
97	PCOLPR	PCA oil generation percent (resource mix)	
98	PCGSPR	PCA gas generation percent (resource mix)	
99	PCNCPR	PCA nuclear generation percent (resource mix)	
100	PCHYPR	PCA hydro generation percent (resource mix)	
101	PCBMPR	PCA biomass generation percent (resource mix)	
102	PCWIPR	PCA wind generation percent (resource mix)	
103	PCSOPR	PCA solar generation percent (resource mix)	
104	PCGTPR	PCA geothermal generation percent (resource mix)	
105	PCOFPR	PCA other fossil generation percent (resource mix)	
106	PCOPPR	PCA other unknown/purchased fuel generation percent (resource mix)	
107	PCTNPR	PCA total nonrenewables generation percent (resource mix)	
108	PCTRPR	PCA total renewables generation percent (resource mix)	
109	PCTHPR	PCA total nonhydro renewables generation percent (resource mix)	
110	PCCYPR	PCA total combustion generation percent (resource mix)	
111	PCCNPR	PCA total noncombustion generation percent (resource mix)	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 SRL File
eGRID Subregion File

Field	Name	Description	Unit
1	*SEQSRL09*	*eGRID2012 year 2009 file eGRID subregion sequence number*	
2	SUBRGN	eGRID subregion acronym	
3	SRNAME	eGRID subregion name	
4	NERC	NERC region acronym associated with the eGRID subregion acronym	
5	NAMEPCAP	eGRID subregion nameplate capacity	MW
6	SRHTIAN	eGRID subregion annual heat input	MMBtu
7	SRHTIOZ	eGRID subregion ozone season heat input	MMBtu
8	SRNGENAN	eGRID subregion annual net generation	MWh
9	SRNGENOZ	eGRID subregion ozone season net generation	MWh
10	SRNOXAN	eGRID subregion annual NO_x emissions	tons
11	SRNOXOZ	eGRID subregion ozone season NO_x emissions	tons
12	SRSO2AN	eGRID subregion annual SO_2 emissions	tons
13	SRCO2AN	eGRID subregion annual CO_2 emissions	tons
14	SRCH4AN	eGRID subregion annual CH_4 emissions	lbs
15	SRN2OAN	eGRID subregion annual N_2O emissions	lbs
16	SRCO2EQA	eGRID subregion annual CO_2 equivalent emissions	tons
17	SRHGAN	eGRID subregion annual Hg emissions	lbs
18	SRNOXRTA	eGRID subregion annual NO_x total output emission rate	lb/MWh
19	SRNOXRTO	eGRID subregion ozone season NO_x total output emission rate	lb/MWh
20	SRSO2RTA	eGRID subregion annual SO_2 total output emission rate	lb/MWh
21	SRCO2RTA	eGRID subregion annual CO_2 total output emission rate	lb/MWh
22	SRCH4RTA	eGRID subregion annual CH_4 total output emission rate	lb/GWh
23	SRN2ORTA	eGRID subregion annual N_2O total output emission rate	lb/GWh
24	SRC2ERTA	eGRID subregion annual CO_2 equivalent total output emission rate	lb/MWh
25	SRHGRTA	eGRID subregion annual Hg total output emission rate	lb/GWh
26	SRNOXRA	eGRID subregion annual NO_x input emission rate	lb/MMBtu
27	SRNOXRO	eGRID subregion ozone season NO_x input emission rate	lb/MMBtu
28	SRSO2RA	eGRID subregion annual SO_2 input emission rate	lb/MMBtu
29	SRCO2RA	eGRID subregion annual CO_2 input emission rate	lb/MMBtu
30	SRHGRA	eGRID subregion annual Hg input emission rate	lb/BBtu
31	SRNOXCRT	eGRID subregion annual NO_x combustion output emission rate	lb/MWh
32	SRNOXCRO	eGRID subregion ozone season NO_x combustion output emission rate	lb/MWh
33	SRSO2CRT	eGRID subregion annual SO_2 combustion output emission rate	lb/MWh
34	SRCO2CRT	eGRID subregion annual CO_2 combustion output emission rate	lb/MWh
35	SRCH4CRT	eGRID subregion annual CH_4 combustion output emission rate	lb/GWh
36	SRN2OCRT	eGRID subregion annual N_2O combustion output emission rate	lb/GWh
37	SRHGCRT	eGRID subregion annual Hg combustion output emission rate	lb/GWh
38	SRCNOXRT	eGRID subregion annual NO_x coal output emission rate	lb/MWh
39	SRONOXRT	eGRID subregion annual NO_x oil output emission rate	lb/MWh
40	SRGNOXRT	eGRID subregion annual NO_x gas output emission rate	lb/MWh
41	SRFSNXRT	eGRID subregion annual NO_x fossil fuel output emission rate	lb/MWh
42	SRCNXORT	eGRID subregion ozone season NO_x coal output emission rate	lb/MWh
43	SRONXORT	eGRID subregion ozone season NO_x oil output emission rate	lb/MWh
44	SRGNXORT	eGRID subregion ozone season NO_x gas output emission rate	lb/MWh
45	SRFSNORT	eGRID subregion ozone season NO_x fossil fuel output emission rate	lb/MWh
46	SRCSO2RT	eGRID subregion annual SO_2 coal output emission rate	lb/MWh
47	SROSO2RT	eGRID subregion annual SO_2 oil output emission rate	lb/MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 SRL File
eGRID Subregion File (continued).

Field	Name	Description	Unit
48	SRGSO2RT	eGRID subregion annual SO_2 gas output emission rate	lb/MWh
49	SRFSS2RT	eGRID subregion annual SO_2 fossil fuel output emission rate	lb/MWh
50	SRCCO2RT	eGRID subregion annual CO_2 coal output emission rate	lb/MWh
51	SROCO2RT	eGRID subregion annual CO_2 oil output emission rate	lb/MWh
52	SRGCO2RT	eGRID subregion annual CO_2 gas output emission rate	lb/MWh
53	SRFSC2RT	eGRID subregion annual CO_2 fossil fuel output emission rate	lb/MWh
54	SRCHGRT	eGRID subregion annual Hg coal output emission rate	lb/GWh
55	SRFSHGRT	eGRID subregion annual Hg fossil fuel output emission rate	lb/GWh
56	SRCNOXR	eGRID subregion annual NO_x coal input emission rate	lb/MMBtu
57	SRONOXR	eGRID subregion annual NO_x oil input emission rate	lb/MMBtu
58	SRGNOXR	eGRID subregion annual NO_x gas input emission rate	lb/MMBtu
59	SRFSNXR	eGRID subregion annual NO_x fossil fuel input emission rate	lb/MMBtu
60	SRCNXOR	eGRID subregion ozone season NO_x coal input emission rate	lb/MMBtu
61	SRONXOR	eGRID subregion ozone season NO_x oil input emission rate	lb/MMBtu
62	SRGNXOR	eGRID subregion ozone season NO_x gas input emission rate	lb/MMBtu
63	SRFSNOR	eGRID subregion ozone season NO_x fossil fuel input emission rate	lb/MMBtu
64	SRCSO2R	eGRID subregion annual SO_2 coal input emission rate	lb/MMBtu
65	SROSO2R	eGRID subregion annual SO_2 oil input emission rate	lb/MMBtu
66	SRGSO2R	eGRID subregion annual SO_2 gas input emission rate	lb/MMBtu
67	SRFSS2R	eGRID subregion annual SO_2 fossil fuel input emission rate	lb/MMBtu
68	SRCCO2R	eGRID subregion annual CO_2 coal input emission rate	lb/MMBtu
69	SROCO2R	eGRID subregion annual CO_2 oil input emission rate	lb/MMBtu
70	SRGCO2R	eGRID subregion annual CO_2 gas input emission rate	lb/MMBtu
71	SRFSC2R	eGRID subregion annual CO_2 fossil fuel input emission rate	lb/MMBtu
72	SRCHGR	eGRID subregion annual Hg coal input emission rate	lb/BBtu
73	SRFSHGR	eGRID subregion annual Hg fossil fuel input emission rate	lb/BBtu
74	SRNBNOX	eGRID subregion annual NO_x non-baseload output emission rate	lb/MWh
75	SRNBNXO	eGRID subregion ozone season NO_x non-baseload output emission rate	lb/MWh
76	SRNBSO2	eGRID subregion annual SO_2 non-baseload output emission rate	lb/MWh
77	SRNBCO2	eGRID subregion annual CO_2 non-baseload output emission rate	lb/MWh
78	SRNBCH4	eGRID subregion annual CH_4 non-baseload output emission rate	lb/GWh
79	SRNBN2O	eGRID subregion annual N_2O non-baseload output emission rate	lb/GWh
80	*SRNBC2ER*	*eGRID subregion annual CO_2 equivalent non-baseload output emission rate*	*lb/MWh*
81	SRNBHG	eGRID subregion annual Hg non-baseload output emission rate	lb/GWh
82	SRGENACL	eGRID subregion annual coal net generation	MWh
83	SRGENAOL	eGRID subregion annual oil net generation	MWh
84	SRGENAGS	eGRID subregion annual gas net generation	MWh
85	SRGENANC	eGRID subregion annual nuclear net generation	MWh
86	SRGENAHY	eGRID subregion annual hydro net generation	MWh
87	SRGENABM	eGRID subregion annual biomass net generation	MWh
88	SRGENAWI	eGRID subregion annual wind net generation	MWh
89	SRGENASO	eGRID subregion annual solar net generation	MWh
90	SRGENAGT	eGRID subregion annual geothermal net generation	MWh
91	SRGENAOF	eGRID subregion annual other fossil net generation	MWh
92	SRGENAOP	eGRID subregion annual other unknown/purchased fuel net generation	MWh
93	SRGENATN	eGRID subregion annual total nonrenewables net generation	MWh
94	SRGENATR	eGRID subregion annual total renewables net generation	MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 SRL File
eGRID Subregion File (continued).

Field	Name	Description	Unit
95	SRGENATH	eGRID subregion annual total nonhydro renewables net generation	MWh
96	SRGENACY	eGRID subregion annual total combustion net generation	MWh
97	SRGENACN	eGRID subregion annual total noncombustion net generation	MWh
98	SRCLPR	eGRID subregion coal generation percent (resource mix)	
99	SROLPR	eGRID subregion oil generation percent (resource mix)	
100	SRGSPR	eGRID subregion gas generation percent (resource mix)	
101	SRNCPR	eGRID subregion nuclear generation percent (resource mix)	
102	SRHYPR	eGRID subregion hydro generation percent (resource mix)	
103	SRBMPR	eGRID subregion biomass generation percent (resource mix)	
104	SRWIPR	eGRID subregion wind generation percent (resource mix)	
105	SRSOPR	eGRID subregion solar generation percent (resource mix)	
106	SRGTPR	eGRID subregion geothermal generation percent (resource mix)	
107	SROFPR	eGRID subregion other fossil generation percent (resource mix)	
108	SROPPR	eGRID subregion other unknown/purchased fuel generation percent (resource mix)	
109	SRTNPR	eGRID subregion total nonrenewables generation percent (resource mix)	
110	SRTRPR	eGRID subregion total renewables generation percent (resource mix)	
111	SRTHPR	eGRID subregion total nonhydro renewables generation percent (resource mix)	
112	SRCYPR	eGRID subregion total combustion generation percent (resource mix)	
113	SRCNPR	eGRID subregion total noncombustion generation percent (resource mix)	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 NRL File
NERC Region File

Field	Name	Description	Unit
1	*SEQNRL09*	*eGRID2012 year 2009 file NERC region sequence number*	
2	NERC	NERC region acronym	
3	NERCNAME	NERC region name	
4	NAMEPCAP	NERC region nameplate capacity	MW
5	NRHTIAN	NERC region annual heat input	MMBtu
6	NRHTIOZ	NERC region ozone season heat input	MMBtu
7	NRNGENAN	NERC region annual net generation	MWh
8	NRNGENOZ	NERC region ozone season net generation	MWh
9	NRNOXAN	NERC region annual NO_x emissions	tons
10	NRNOXOZ	NERC region ozone season NO_x emissions	tons
11	NRSO2AN	NERC region annual SO_2 emissions	tons
12	NRCO2AN	NERC region annual CO_2 emissions	tons
13	NRCH4AN	NERC region annual CH_4 emissions	lbs
14	NRN2OAN	NERC region annual N_2O emissions	lbs
15	NRCO2EQA	NERC region annual CO_2 equivalent emissions	tons
16	NRHGAN	NERC region annual Hg emissions	lbs
17	NRNOXRTA	NERC region annual NO_x total output emission rate	lb/MWh
18	NRNOXRTO	NERC region ozone season NO_x total output emission rate	lb/MWh
19	NRSO2RTA	NERC region annual SO_2 total output emission rate	lb/MWh
20	NRCO2RTA	NERC region annual CO_2 total output emission rate	lb/MWh
21	NRCH4RTA	NERC region annual CH_4 total output emission rate	lb/GWh
22	NRN2ORTA	NERC region annual N_2O total output emission rate	lb/GWh
23	NRC2ERTA	NERC region annual CO_2 equivalent total output emission rate	lb/MWh
24	NRHGRTA	NERC region annual Hg total output emission rate	lb/GWh
25	NRNOXRA	NERC region annual NO_x input emission rate	lb/MMBtu
26	NRNOXRO	NERC region ozone season NO_x input emission rate	lb/MMBtu
27	NRSO2RA	NERC region annual SO_2 input emission rate	lb/MMBtu
28	NRCO2RA	NERC region annual CO_2 input emission rate	lb/MMBtu
29	NRHGRA	NERC region annual Hg input emission rate	lb/BBtu
30	NRNOXCRT	NERC region annual NO_x combustion output emission rate	lb/MWh
31	NRNOXCRO	NERC region ozone season NO_x combustion output emission rate	lb/MWh
32	NRSO2CRT	NERC region annual SO_2 combustion output emission rate	lb/MWh
33	NRCO2CRT	NERC region annual CO_2 combustion output emission rate	lb/MWh
34	NRCH4CRT	NERC region annual CH_4 combustion output emission rate	lb/GWh
35	NRN2OCRT	NERC region annual N_2O combustion output emission rate	lb/GWh
36	NRHGCRT	NERC region annual Hg combustion output emission rate	lb/GWh
37	NRCNOXRT	NERC region annual NO_x coal output emission rate	lb/MWh
38	NRONOXRT	NERC region annual NO_x oil output emission rate	lb/MWh
39	NRGNOXRT	NERC region annual NO_x gas output emission rate	lb/MWh
40	NRFSNXRT	NERC region annual NO_x fossil fuel output emission rate	lb/MWh
41	NRCNXORT	NERC region ozone season NO_x coal output emission rate	lb/MWh
42	NRONXORT	NERC region ozone season NO_x oil output emission rate	lb/MWh
43	NRGNXORT	NERC region ozone season NO_x gas output emission rate	lb/MWh
44	NRFSNORT	NERC region ozone season NO_x fossil fuel output emission rate	lb/MWh
45	NRCSO2RT	NERC region annual SO_2 coal output emission rate	lb/MWh
46	NROSO2RT	NERC region annual SO_2 oil output emission rate	lb/MWh
47	NRGSO2RT	NERC region annual SO_2 gas output emission rate	lb/MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 NRL File
NERC Region File (continued).

Field	Name	Description	Unit
48	NRFSS2RT	NERC region annual SO_2 fossil fuel output emission rate	lb/MWh
49	NRCCO2RT	NERC region annual CO_2 coal output emission rate	lb/MWh
50	NROCO2RT	NERC region annual CO_2 oil output emission rate	lb/MWh
51	NRGCO2RT	NERC region annual CO_2 gas output emission rate	lb/MWh
52	NRFSC2RT	NERC region annual CO_2 fossil fuel output emission rate	lb/MWh
53	NRCHGRT	NERC region annual Hg coal output emission rate	lb/GWh
54	NRFSHGRT	NERC region annual Hg fossil fuel output emission rate	lb/GWh
55	NRCNOXR	NERC region annual NO_x coal input emission rate	lb/MMBtu
56	NRONOXR	NERC region annual NO_x oil input emission rate	lb/MMBtu
57	NRGNOXR	NERC region annual NO_x gas input emission rate	lb/MMBtu
58	NRFSNXR	NERC region annual NO_x fossil fuel input emission rate	lb/MMBtu
59	NRCNXOR	NERC region ozone season NO_x coal input emission rate	lb/MMBtu
60	NRONXOR	NERC region ozone season NO_x oil input emission rate	lb/MMBtu
61	NRGNXOR	NERC region ozone season NO_x gas input emission rate	lb/MMBtu
62	NRFSNOR	NERC region ozone season NO_x fossil fuel input emission rate	lb/MMBtu
63	NRCSO2R	NERC region annual SO_2 coal input emission rate	lb/MMBtu
64	NROSO2R	NERC region annual SO_2 oil input emission rate	lb/MMBtu
65	NRGSO2R	NERC region annual SO_2 gas input emission rate	lb/MMBtu
66	NRFSS2R	NERC region annual SO_2 fossil fuel input emission rate	lb/MMBtu
67	NRCCO2R	NERC region annual CO_2 coal input emission rate	lb/MMBtu
68	NROCO2R	NERC region annual CO_2 oil input emission rate	lb/MMBtu
69	NRGCO2R	NERC region annual CO_2 gas input emission rate	lb/MMBtu
70	NRFSC2R	NERC region annual CO_2 fossil fuel input emission rate	lb/MMBtu
71	NRCHGR	NERC region annual Hg coal input emission rate	lb/BBtu
72	NRFSHGR	NERC region annual Hg fossil fuel input emission rate	lb/BBtu
73	NRNBNOX	NERC region annual NO_x non-baseload output emission rate	lb/MWh
74	NRNBNXO	NERC region ozone season NO_x non-baseload output emission rate	lb/MWh
75	NRNBSO2	NERC region annual SO_2 non-baseload output emission rate	lb/MWh
76	NRNBCO2	NERC region annual CO_2 non-baseload output emission rate	lb/MWh
77	NRNBCH4	NERC region annual CH_4 non-baseload output emission rate	lb/GWh
78	NRNBN2O	NERC region annual N_2O non-baseload output emission rate	lb/GWh
79	NRNBHG	NERC region annual Hg non-baseload output emission rate	lb/GWh
80	NRGENACL	NERC region annual coal net generation	MWh
81	NRGENAOL	NERC region annual oil net generation	MWh
82	NRGENAGS	NERC region annual gas net generation	MWh
83	NRGENANC	NERC region annual nuclear net generation	MWh
84	NRGENAHY	NERC region annual hydro net generation	MWh
85	NRGENABM	NERC region annual biomass net generation	MWh
86	NRGENAWI	NERC region annual wind net generation	MWh
87	NRGENASO	NERC region annual solar net generation	MWh
88	NRGENAGT	NERC region annual geothermal net generation	MWh
89	NRGENAOF	NERC region annual other fossil net generation	MWh
90	NRGENAOP	NERC region annual other unknown/purchased fuel net generation	MWh
91	NRGENATN	NERC region annual total nonrenewables net generation	MWh
92	NRGENATR	NERC region annual total renewables net generation	MWh
93	NRGENATH	NERC region annual total nonhydro renewables net generation	MWh
94	NRGENACY	NERC region annual total combustion net generation	MWh

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 NRL File
NERC Region File (continued).

Field	Name	Description	Unit
95	NRGENACN	NERC region annual total noncombustion net generation	MWh
96	NRCLPR	NERC region coal generation percent (resource mix)	
97	NROLPR	NERC region oil generation percent (resource mix)	
98	NRGSPR	NERC region gas generation percent (resource mix)	
99	NRNCPR	NERC region nuclear generation percent (resource mix)	
100	NRHYPR	NERC region hydro generation percent (resource mix)	
101	NRBMPR	NERC region biomass generation percent (resource mix)	
102	NRWIPR	NERC region wind generation percent (resource mix)	
103	NRSOPR	NERC region solar generation percent (resource mix)	
104	NRGTPR	NERC region geothermal generation percent (resource mix)	
105	NROFPR	NERC region other fossil generation percent (resource mix)	
106	NROPPR	NERC region other unknown/purchased fuel generation percent (resource mix)	
107	NRTNPR	NERC region total nonrenewables generation percent (resource mix)	
108	NRTRPR	NERC region total renewables generation percent (resource mix)	
109	NRTHPR	NERC region total nonhydro renewables generation percent (resource mix)	
110	NRCYPR	NERC region total combustion generation percent (resource mix)	
111	NRCNPR	NERC region total noncombustion generation percent (resource mix)	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 U.S. File
United States File

Field	Name	Description	Unit	Source(s)
1	*SEQUS09*	*eGRID2012 year 2009 file U.S. sequence number*		
2	NAMEPCAP	U.S. nameplate capacity	MW	
3	USHTIAN	U.S. annual heat input	MMBtu	
4	USHTIOZ	U.S. ozone season heat input	MMBtu	
5	USNGENAN	U.S. annual net generation	MWh	
6	USNGENOZ	U.S. ozone season net generation	MWh	
7	USNOXAN	U.S. annual NO_x emissions	tons	
8	USNOXOZ	U.S. ozone season NO_x emissions	tons	
9	USSO2AN	U.S. annual SO_2 emissions	tons	
10	USCO2AN	U.S. annual CO_2 emissions	tons	
11	USCH4AN	U.S. annual CH_4 emissions	lbs	
12	USN2OAN	U.S. annual N_2O emissions	lbs	
13	USCO2EQA	U.S. annual CO_2 equivalent emissions	tons	
14	USHGAN	U.S. annual Hg emissions	lbs	
15	USNOXRTA	U.S. annual NO_x total output emission rate	lb/MWh	
16	USNOXRTO	U.S. ozone season NO_x total output emission rate	lb/MWh	
17	USSO2RTA	U.S. annual SO_2 total output emission rate	lb/MWh	
18	USCO2RTA	U.S. annual CO_2 total output emission rate	lb/MWh	
19	USCH4RTA	U.S. annual CH_4 total output emission rate	lb/GWh	
20	USN2ORTA	U.S. annual N_2O total output emission rate	lb/GWh	
21	USC2ERTA	U.S. annual CO_2 equivalent total output emission rate	lb/MWh	
22	USHGRTA	U.S. annual Hg total output emission rate	lb/GWh	
23	USNOXRA	U.S. annual NO_x input emission rate	lb/MMBtu	
24	USNOXRO	U.S. ozone season NO_x input emission rate	lb/MMBtu	
25	USSO2RA	U.S. annual SO_2 input emission rate	lb/MMBtu	
26	USCO2RA	U.S. annual CO_2 input emission rate	lb/MMBtu	
27	USHGRA	U.S. annual Hg input emission rate	lb/BBtu	
28	USNOXCRT	U.S. annual NO_x combustion output emission rate	lb/MWh	
29	USNOXCRO	U.S. ozone season NO_x combustion output emission rate	lb/MWh	
30	USSO2CRT	U.S. annual SO_2 combustion output emission rate	lb/MWh	
31	USCO2CRT	U.S. annual CO_2 combustion output emission rate	lb/MWh	
32	USCH4CRT	U.S. annual CH_4 combustion output emission rate	lb/GWh	
33	USN2OCRT	U.S. annual N_2O combustion output emission rate	lb/GWh	
34	USHGCRT	U.S. annual Hg combustion output emission rate	lb/GWh	
35	USCNOXRT	U.S. annual NO_x coal output emission rate	lb/MWh	
36	USONOXRT	U.S. annual NO_x oil output emission rate	lb/MWh	
37	USGNOXRT	U.S. annual NO_x gas output emission rate	lb/MWh	
38	USFSNXRT	U.S. annual NO_x fossil fuel output emission rate	lb/MWh	
39	USCNXORT	U.S. ozone season NO_x coal output emission rate	lb/MWh	
40	USONXORT	U.S. ozone season NO_x oil output emission rate	lb/MWh	
41	USGNXORT	U.S. ozone season NO_x gas output emission rate	lb/MWh	
42	USFSNORT	U.S. ozone season NO_x fossil fuel output emission rate	lb/MWh	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 U.S. File
United States File (continued).

Field	Name	Description	Unit	Source(s)
43	USCSO2RT	U.S. annual SO_2 coal output emission rate	lb/MWh	
44	USOSO2RT	U.S. annual SO_2 oil output emission rate	lb/MWh	
45	USGSO2RT	U.S. annual SO_2 gas output emission rate	lb/MWh	
46	USFSS2RT	U.S. annual SO_2 fossil fuel output emission rate	lb/MWh	
47	USCCO2RT	U.S. annual CO_2 coal output emission rate	lb/MWh	
48	USOCO2RT	U.S. annual CO_2 oil output emission rate	lb/MWh	
49	USGCO2RT	U.S. annual CO_2 gas output emission rate	lb/MWh	
50	USFSC2RT	U.S. annual CO_2 fossil fuel output emission rate	lb/MWh	
51	USCHGRT	U.S. annual Hg coal output emission rate	lb/GWh	
52	USFSHGRT	U.S. annual Hg fossil fuel output emission rate	lb/GWh	
53	USCNOXR	U.S. annual NO_x coal input emission rate	lb/MMBtu	
54	USONOXR	U.S. annual NO_x oil input emission rate	lb/MMBtu	
55	USGNOXR	U.S. annual NO_x gas input emission rate	lb/MMBtu	
56	USFSNXR	U.S. annual NO_x fossil fuel input emission rate	lb/MMBtu	
57	USCNXOR	U.S. ozone season NO_x coal input emission rate	lb/MMBtu	
58	USONXOR	U.S. ozone season NO_x oil input emission rate	lb/MMBtu	
59	USGNXOR	U.S. ozone season NO_x gas input emission rate	lb/MMBtu	
60	USFSNOR	U.S. ozone season NO_x fossil fuel input emission rate	lb/MMBtu	
61	USCSO2R	U.S. annual SO_2 coal input emission rate	lb/MMBtu	
62	USOSO2R	U.S. annual SO_2 oil input emission rate	lb/MMBtu	
63	USGSO2R	U.S. annual SO_2 gas input emission rate	lb/MMBtu	
64	USFSS2R	U.S. annual SO_2 fossil fuel input emission rate	lb/MMBtu	
65	USCCO2R	U.S. annual CO_2 coal input emission rate	lb/MMBtu	
66	USOCO2R	U.S. annual CO_2 oil input emission rate	lb/MMBtu	
67	USGCO2R	U.S. annual CO_2 gas input emission rate	lb/MMBtu	
68	USFSC2R	U.S. annual CO_2 fossil fuel input emission rate	lb/MMBtu	
69	USCHGR	U.S. annual Hg coal input emission rate	lb/BBtu	
70	USFSHGR	U.S. annual Hg fossil fuel input emission rate	lb/BBtu	
71	USNBNOX	U.S. annual NO_x non-baseload output emission rate	lb/MWh	
72	USNBNXO	U.S. ozone season NO_x non-baseload output emission rate	lb/MWh	
73	USNBSO2	U.S. annual SO_2 non-baseload output emission rate	lb/MWh	
74	USNBCO2	U.S. annual CO_2 non-baseload output emission rate	lb/MWh	
75	USNBCH4	U.S. annual CH_4 non-baseload output emission rate	lb/GWh	
76	USNBN2O	U.S. annual N_2O non-baseload output emission rate	lb/GWh	
77	USNBHG	U.S. annual Hg non-baseload output emission rate	lb/GWh	
78	USGENACL	U.S. annual coal net generation	MWh	
79	USGENAOL	U.S. annual oil net generation	MWh	
80	USGENAGS	U.S. annual gas net generation	MWh	
81	USGENANC	U.S. annual nuclear net generation	MWh	
82	USGENAHY	U.S. annual hydro net generation	MWh	
83	USGENABM	U.S. annual biomass net generation	MWh	
84	USGENAWI	U.S. annual wind net generation	MWh	
85	USGENASO	U.S. annual solar net generation	MWh	
86	USGENAGT	U.S. annual geothermal net generation	MWh	
87	USGENAOF	U.S. annual other fossil net generation	MWh	
88	USGENAOP	U.S. annual other unknown/purchased fuel net generation	MWh	

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 U.S. File
United States File (continued).

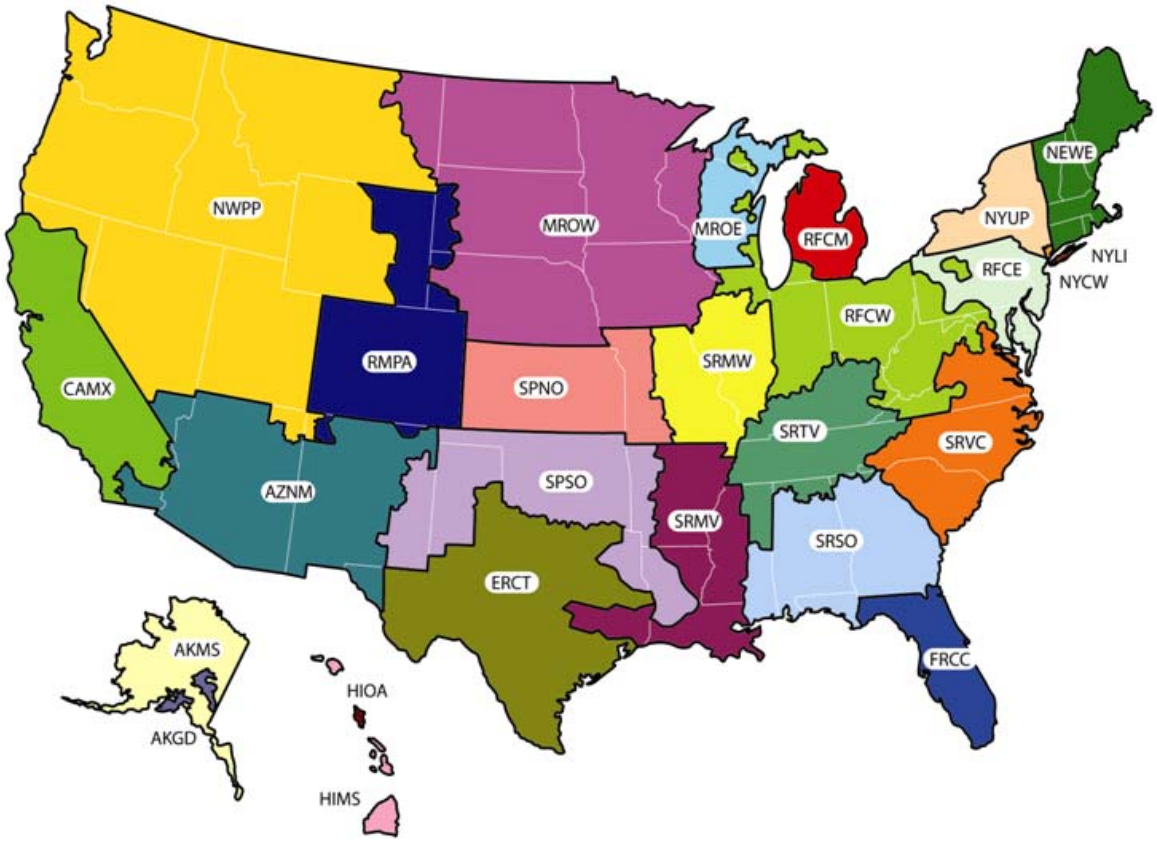
Field	Name	Description	Unit	Source(s)
89	USGENATN	U.S. annual total nonrenewables net generation	MWh	
90	USGENATR	U.S. annual total renewables net generation	MWh	
91	USGENATH	U.S. annual total nonhydro renewables net generation	MWh	
92	USGENACY	U.S. annual total combustion net generation	MWh	
93	USGENACN	U.S. annual total noncombustion net generation	MWh	
94	USCLPR	U.S. coal generation percent (resource mix)		
95	USOLPR	U.S. oil generation percent (resource mix)		
96	USGSPR	U.S. gas generation percent (resource mix)		
97	USNCPR	U.S. nuclear generation percent (resource mix)		
98	USHYPR	U.S. hydro generation percent (resource mix)		
99	USBMPR	U.S. biomass generation percent (resource mix)		
100	USWIPR	U.S. wind generation percent (resource mix)		
101	USSOPR	U.S. solar generation percent (resource mix)		
102	USGTPR	U.S. geothermal generation percent (resource mix)		
103	USOFPR	U.S. other fossil generation percent (resource mix)		
104	USOPPR	U.S. other unknown/purchased fuel generation percent (resource mix)		
105	USTNPR	U.S. total nonrenewables generation percent (resource mix)		
106	USTRPR	U.S. total renewables generation percent (resource mix)		
107	USTHPR	U.S. total nonhydro renewables generation percent (resource mix)		
108	USCYPR	U.S. total combustion generation percent (resource mix)		
109	USCNPR	U.S. total noncombustion generation percent (resource mix)		

Table A-1
eGRID2012 Version 1.0 File Structure
Year 2009 GGL File
Grid Gross Loss (%) File

Field	Name	Description	Unit	Source(s)
1	*REGION*	*One of the three interconnect power grids in the U.S. (plus Alaska, Hawaii, and the entire U.S.)*		
2	*GENERAT*	*The regional total net generation*	*MWh*	*2009 FERC-714 updated by EIA, but eGRID yr 2009 net generation for ASCC and HICC*
3	*FRGNINTC*	*The regional net foreign interchange with Canada and Mexico (imports are positive)*	*MWh*	*2009 FERC-714 updated by EIA*
4	*INTRCHNG*	*The regional total net interchange with a different U.S. region (imports are positive)*	*MWh*	*2009 FERC-714 + updates*
5	*CONSUMP*	*The regional total consumption*	*MWh*	*2009 EIA-861 Files 1 & 2 + updates*
6	*GGRSLOSS*	*The estimated regional grid gross loss as a percent [= 100 * (GENERAT + FRGNINTC+ INTRCHNG - CONSUMP) / GENERAT)]*	*%*	
7	*YEAR*	*Data year*		

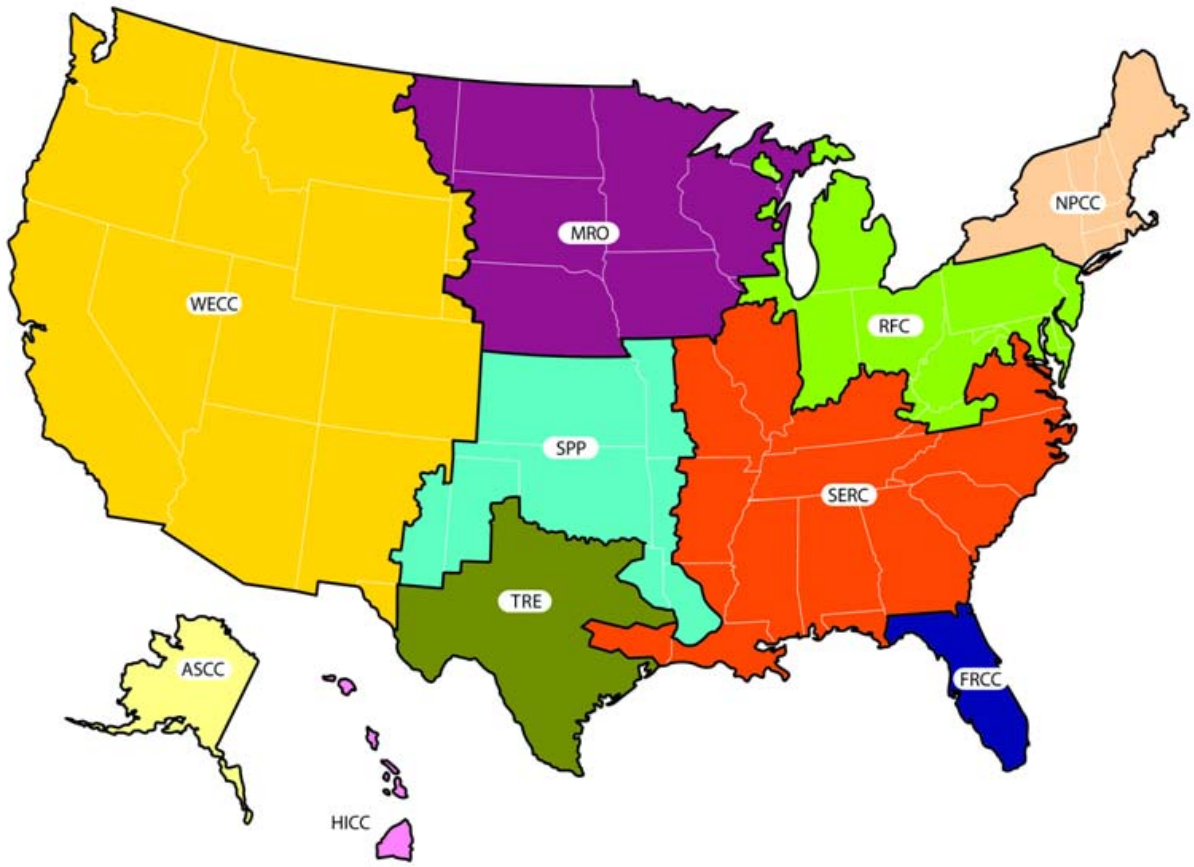
APPENDIX B. eGRID2012 eGRID SUBREGION AND NERC REGION REPRESENTATIONAL MAPS

Figure B-1. eGRID2012 eGRID Subregion Representational Map



This is a representational map; many of the boundaries shown on this map are approximate because they are based on companies, not on strictly geographical boundaries.

Figure B-2. eGRID2012 NERC Region Representational Map



This is a representational map; many of the boundaries shown on this map are approximate because they are based on companies, not on strictly geographical boundaries.