ENERGY FUTURES DASHBOARD

Description of White Papers Documenting the Energy Futures Dashboard (EFD) of the Energy Infrastructure of the Future (EIoF)

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Abstract

This document summarizes the list of documents that describe the data and methods governing the calculations of the Energy Futures Dashboard (EFD) of the Energy Infrastructure of the Future (EIoF) project.

Introduction

The Energy Infrastructure of the Future (EIoF) study seeks to provide a robust understanding of the state of the cost and other impacts of energy infrastructure and consumption in the United States. The flagship product of the EIoF project is the Energy Futures Dashboard, a user interactive web-based tool that allows users to see the impacts of their choices for three major categories of energy production and use for the year 2050: electricity generation mix, the percentage of light-duty vehicles driven on electricity versus liquid fuels, and the percentage of homes heated by electricity and natural gas. For the purposes of this study, the country is divided into geographic regions established by the EIoF project (see Figure 1). The regional definitions enable us to investigate broad geographical differences in energy infrastructure quantities, costs, regulations, and customers that can be compared to trends for the continental United States. In total, there are 13 regions comprised of one or more states.

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Documentation of Documents for Energy Futures Dashboard of the Energy Infrastructure of the Future study, September 2020 (paper 2020.1)
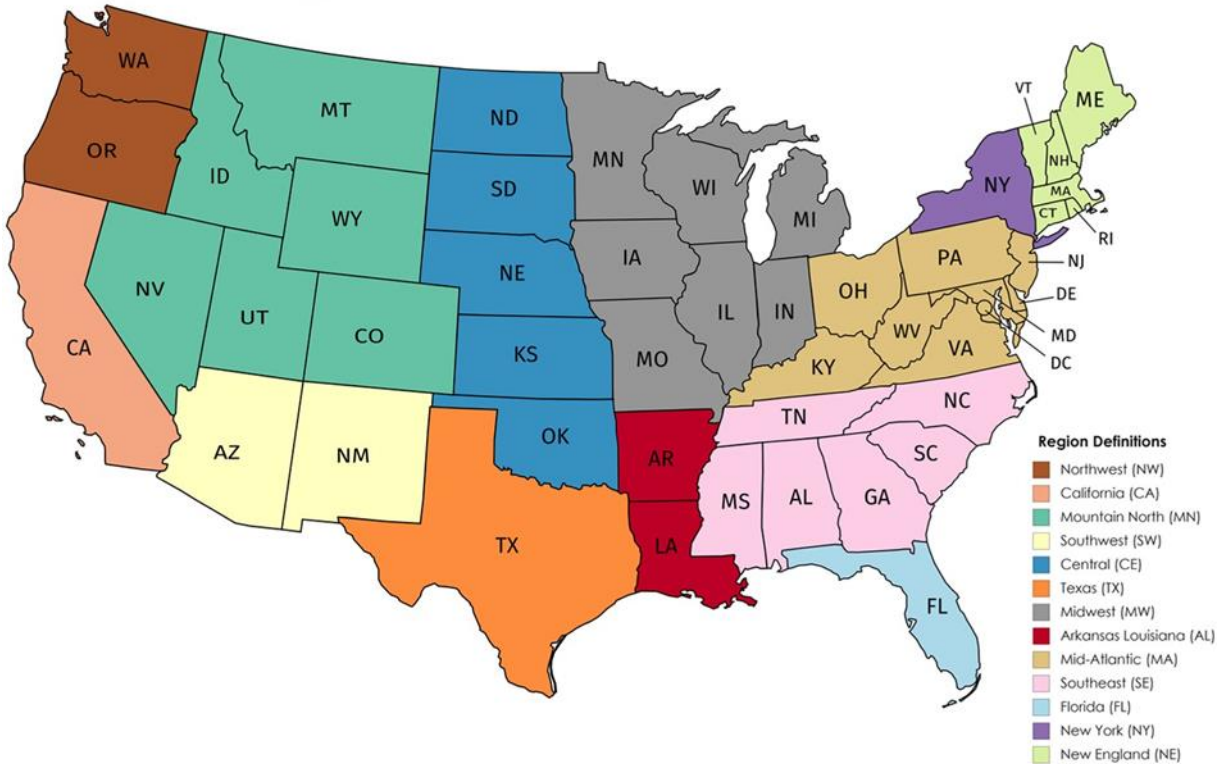
Energy Infrastrucutre of the Future Region Defintions

Figure 1. Regional definitions used for analysis in the Energy Infrastructure of the Future (EIoF) study.

This document summarizes the list of documents that describe the data and methods governing the calculations of the Energy Futures Dashboard (EFD) of the Energy Infrastructure of the Future (EIoF) project.

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EIoF White Papers and Summary Descriptions

Table 1 lists the complete set of white papers that document the data, organization, and methods of the EFD. Read each listed document as needed to understand the methods of the EFD.

Table 1. List of EIoF white papers documenting the data and methods governing the Energy Futures Dashboard tool.

White Paper Number	White Paper Title	Description
Documentation of Data Acquisition and Organization		
2020.1	Description of White Papers Documenting the Energy Futures Dashboard (EFD) of the Energy Infrastructure of the Future (EIoF) Filename: *EIoF-EFD ListOfDocumentation 2020.1.pdf*	This present document. Lists and summarizes the content of all EFD documentation.
2020.2	Constructing Hourly Electricity Demand Profiles for Energy Infrastructure of the Future regions Filename: *EIoF-EFD Hourly Demand Profiles 2020.2.pdf*	Discusses the arrangement of the baseline hourly electricity load profiles (for years 2016 and 2017) for each EIoF region using data from the Energy Information Administration real-time Electric System Operating Data portal.
2020.3	Historical and Assumed Future (to 2050) Population and Electricity Customers by EIoF Region Filename: "*EIoF-EFD Regions_Pop_Customer_Projections 2020.3.pdf*"	Describes aggregation of data for population and the number of electricity customers per EIoF region. These data are used to present energy cost and spending results on per person and per customer bases.
2020.4	Calculation of Historical, Baseline, and Future Energy Flows to 2050 by Region Filename: *EIoF-EFD Baseline 2050 Energy Projections Documentation 2020.4.pdf*	Describes data sources and methods to calculate historical and future annual energy demand (quads of all primary energy) using EIA Annual Energy Outlook. Also describes data and methods for assumptions of hourly electricity demand profiles for (i) electric vehicles and (i) residential buildings. References several R codes and data files.

Documentation of Documents for Energy Futures Dashboard of the Energy Infrastructure of the Future study, September 2020 (paper 2020.1)

Table 1. (continued) List of EIoF white papers documenting the data and methods governing the Energy Futures Dashboard tool.

White Paper Number	White Paper Title	Description
Documentation for Algorithms and Calculations that use EFD user inputs to calculate energy and cost outputs		
2020.5	Description of solveGEN.R Code that Solves for Power Plant Capacity and Dispatch given Desired User Electricity Mix Filename: *EIoF-EFD solveGEN Documentation 2020.5.pdf*	Describes data, assumptions, and calculations for code "solveGEN.R" that solves for the hourly dispatch and necessary installed capacity of each type of power plant.
2020.6	Documentation of Cost Calculations for the Energy Futures Dashboard of the Energy Infrastructure of the Future Study Filename: *EIOF-EFD Cost Calculations Documentation 2020.6.pdf*	Describes the assumptions and methodology for the cost calculations of the Energy Futures Dashboard.