

# Estimated International Energy Flows

---

2007

C.A. Smith, R.D. Belles, and A.J. Simon

March 2011

Abstract	.....	1
Introduction	.....	1
Flow Charts		
Individual National Energy Flow Charts	.....	2
Global Energy Flow Chart	.....	137
Analysis	.....	138
Flow Definitions	.....	139
Conclusions	.....	146
References	.....	146

# 2007 Estimated International Energy Flows

Clara Smith, Rich Belles and A.J. Simon

Lawrence Livermore National Laboratory

## Abstract

An energy flow chart or “atlas” for 136 countries has been constructed from data maintained by the International Energy Agency (IEA) and estimates of energy use patterns for the year 2007. Approximately 490 exajoules (460 quadrillion BTU) of primary energy are used in aggregate by these countries each year. While the basic structure of the energy system is consistent from country to country, patterns of resource use and consumption vary. Energy can be visualized as it flows from resources (i.e. coal, petroleum, natural gas) through transformations such as electricity generation to end uses (i.e. residential, commercial, industrial, transportation). These flow patterns are visualized in this atlas of 136 country-level energy flow charts.

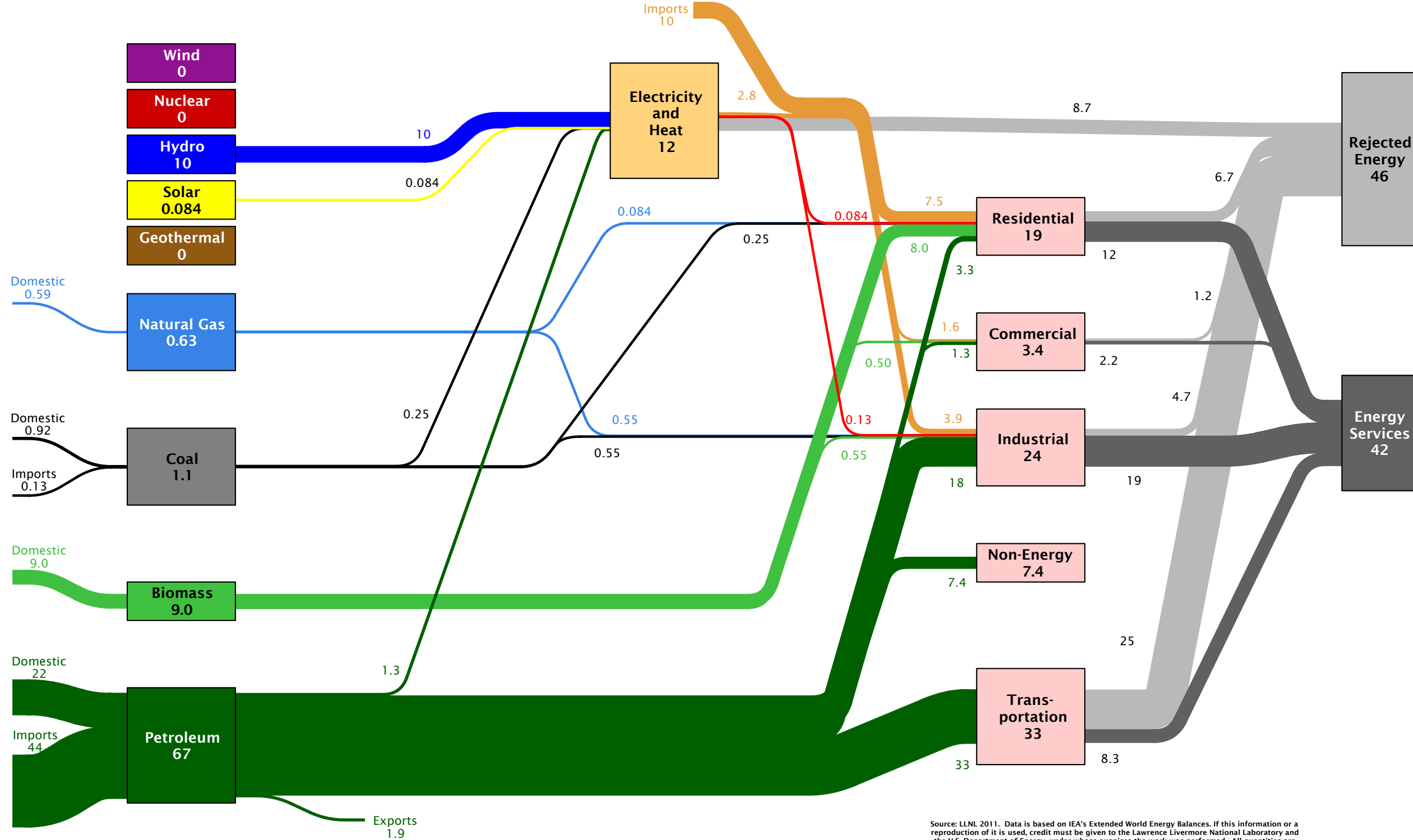
## Introduction

Lawrence Livermore National Lab (LLNL) has published flow charts (also referred to as “Sankey Diagrams”) of important national commodities since the early 1970s. The most widely recognized of these charts is the U.S. energy flow chart (<http://flowcharts.llnl.gov>). LLNL has also published charts depicting carbon (or carbon dioxide potential) flow and water flow at the national level as well as energy, carbon, and water flows at the international, state, municipal, and organizational (i.e. United States Air Force) level. Flow charts are valuable as single-page references that contain quantitative data about resource, commodity, and byproduct flows in a graphical form that also conveys structural information about the system that manages those flows.

This is the first comprehensive package of worldwide country-level energy flowcharts that has been produced.

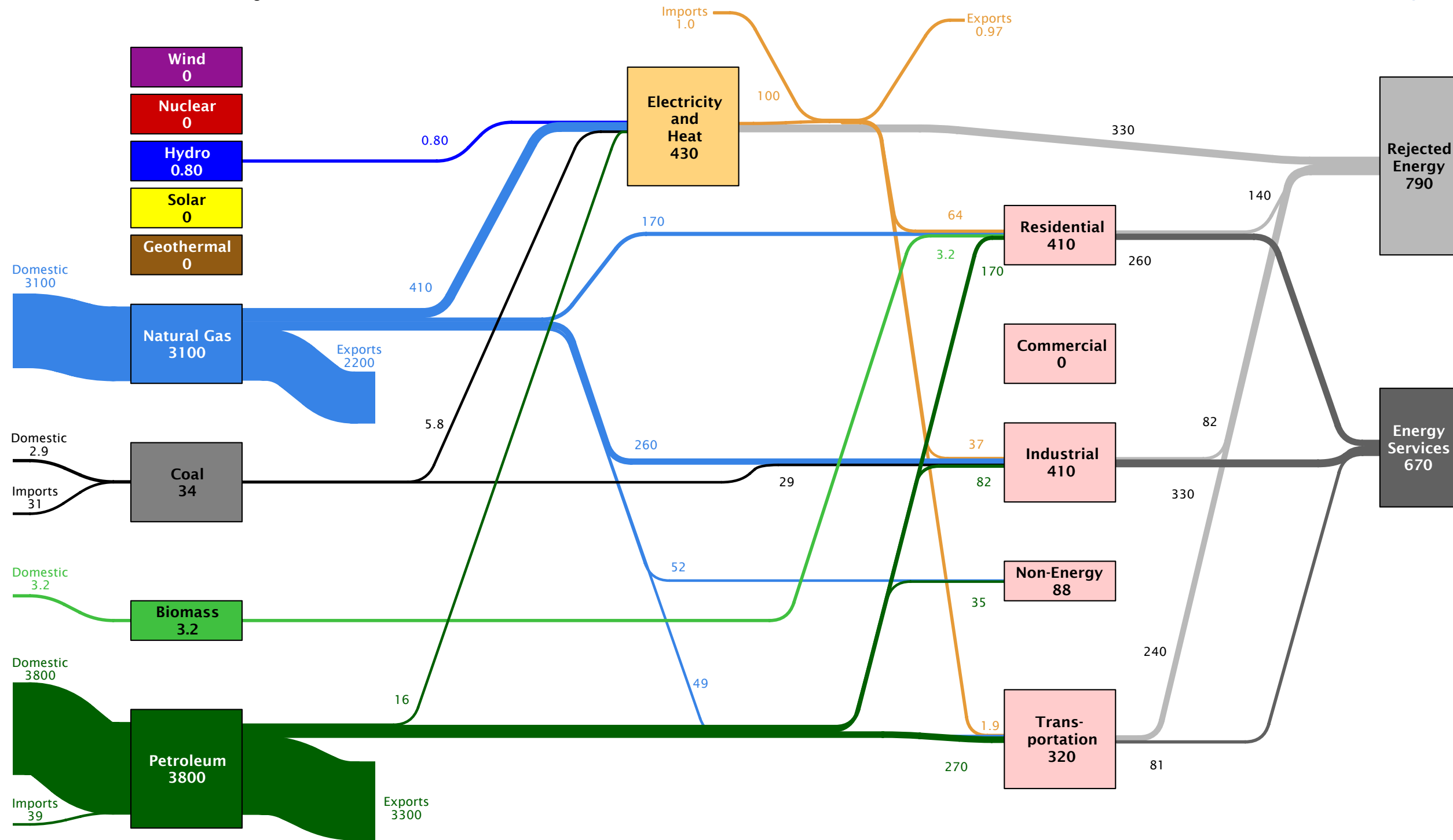
Energy use data is compiled by the IEA in the publications: Energy Balances of Non-OECD Countries and Energy Balances of OECD Countries. These publications are updated annually and generally report data for the time period two years prior to its year of update (ie. the 2009 update records energy use in 2007). IEA data contains information on primary resource consumption, electricity generation, and energy consumption within each of the economic sectors.

Albania Energy Flow  
in 2007: ~96 PJ



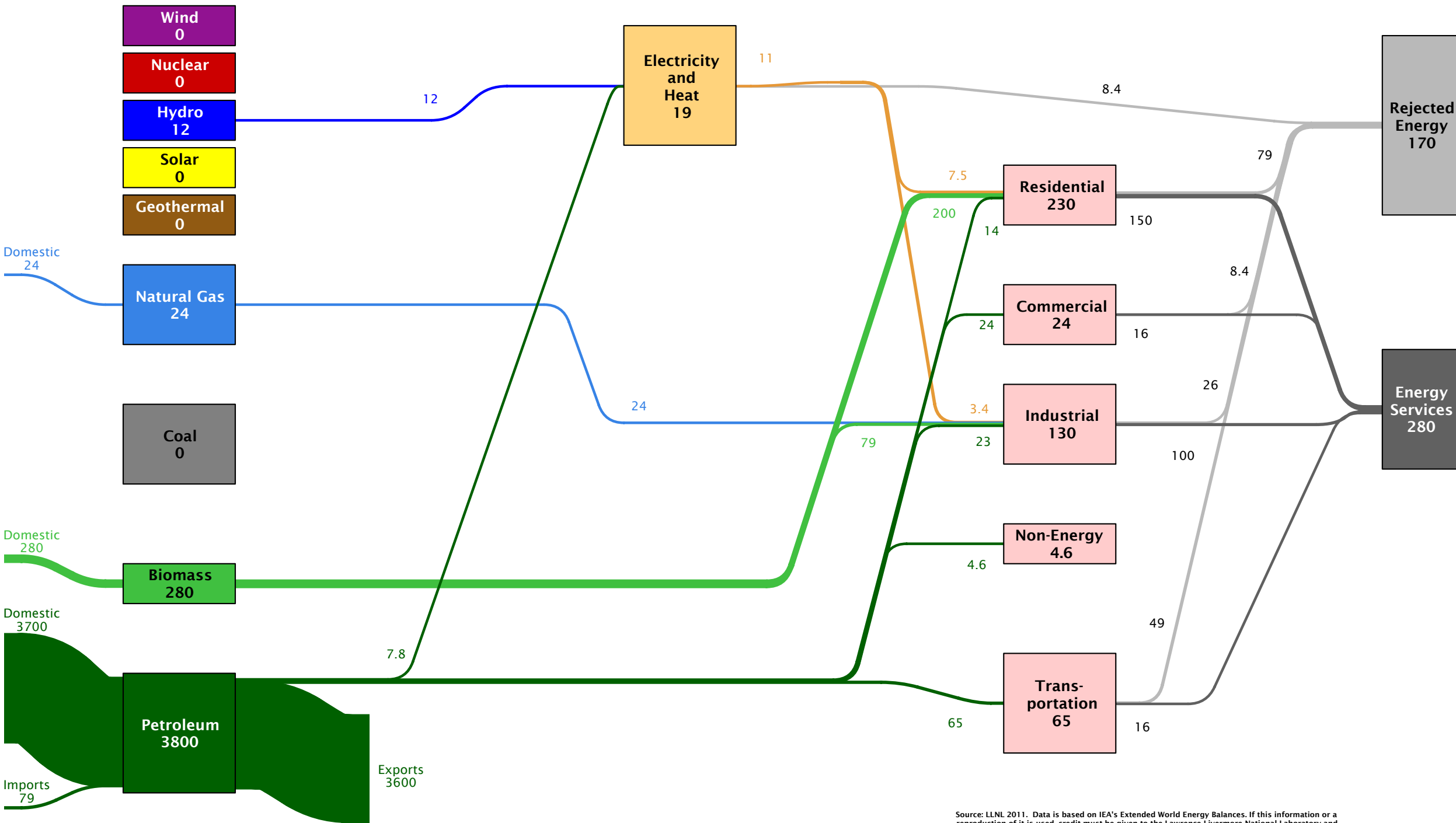
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Algeria Energy Flow  
in 2007: ~1600 PJ



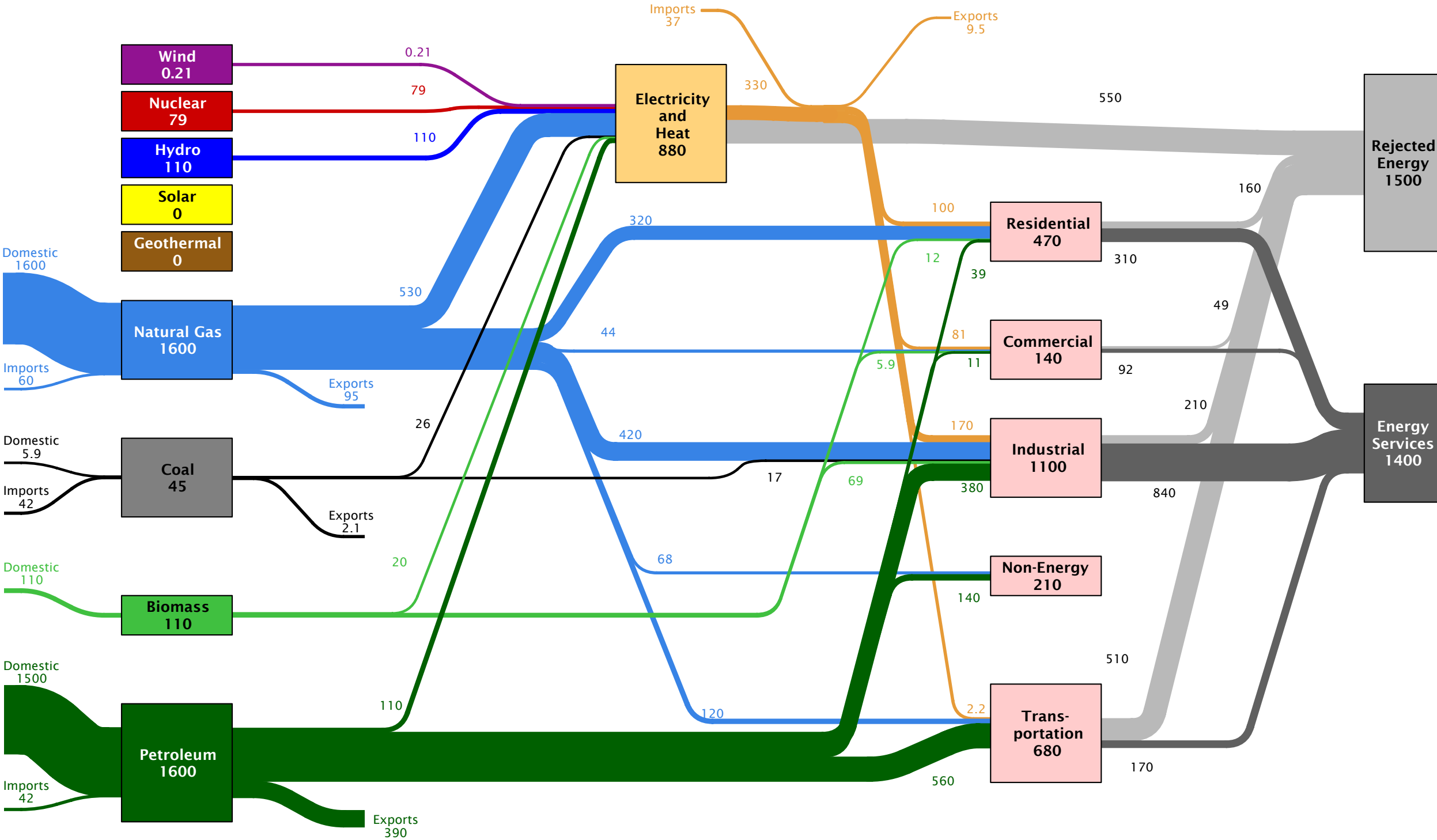
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Angola Energy Flow  
in 2007: ~460 PJ



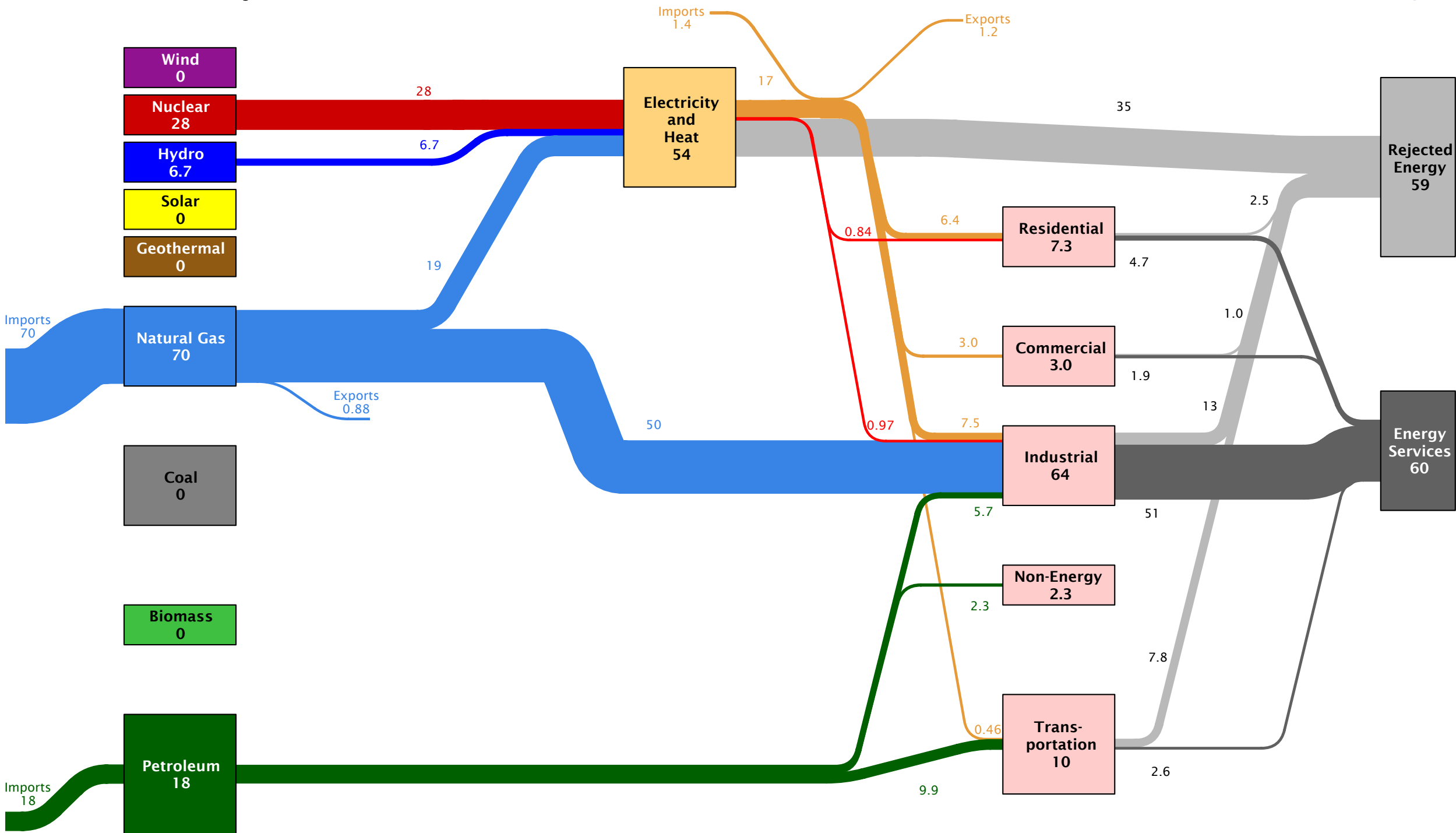
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Argentina Energy Flow in 2007: ~3100 PJ



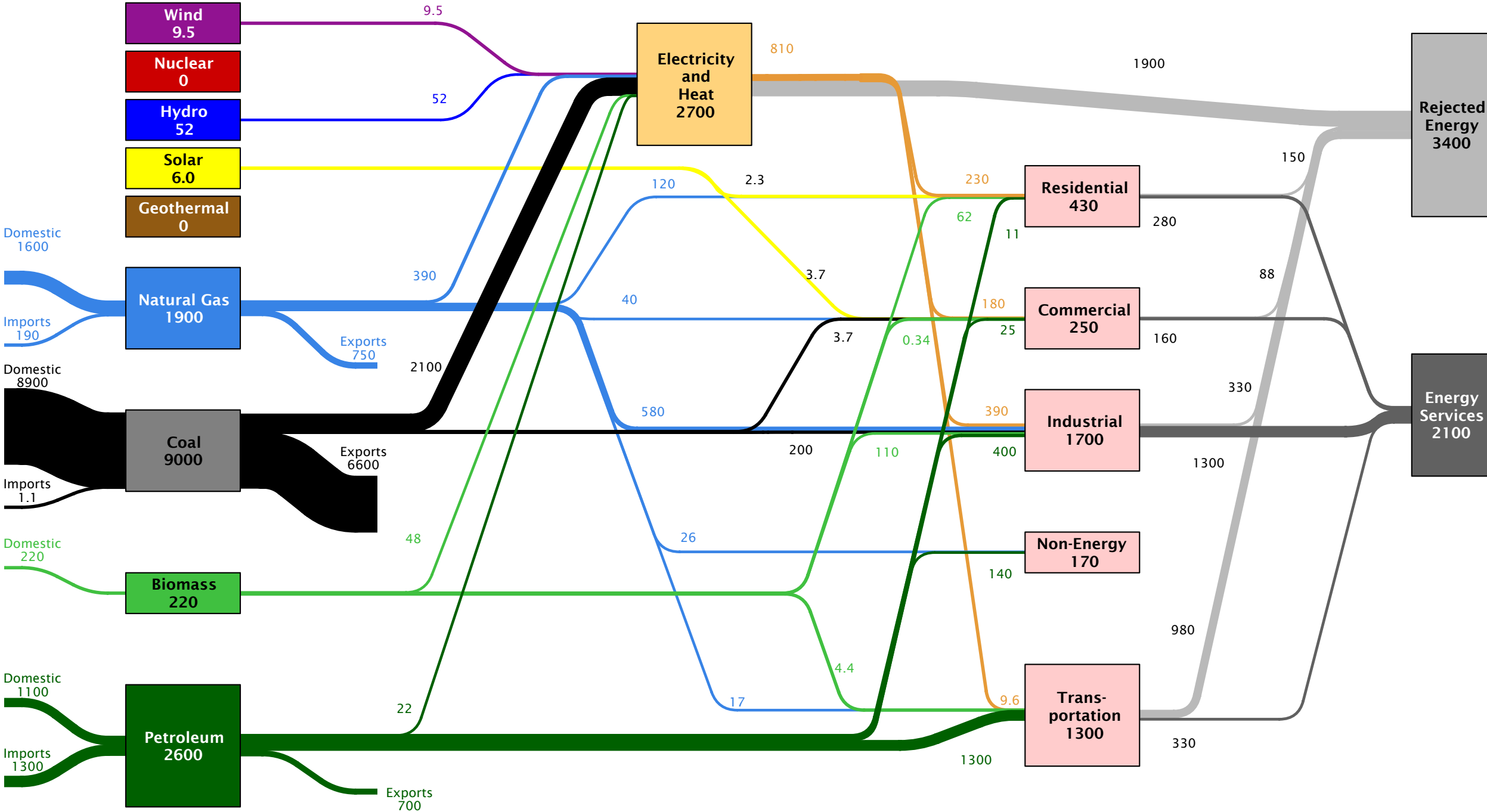
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Armenia Energy Flow  
in 2007: ~120 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

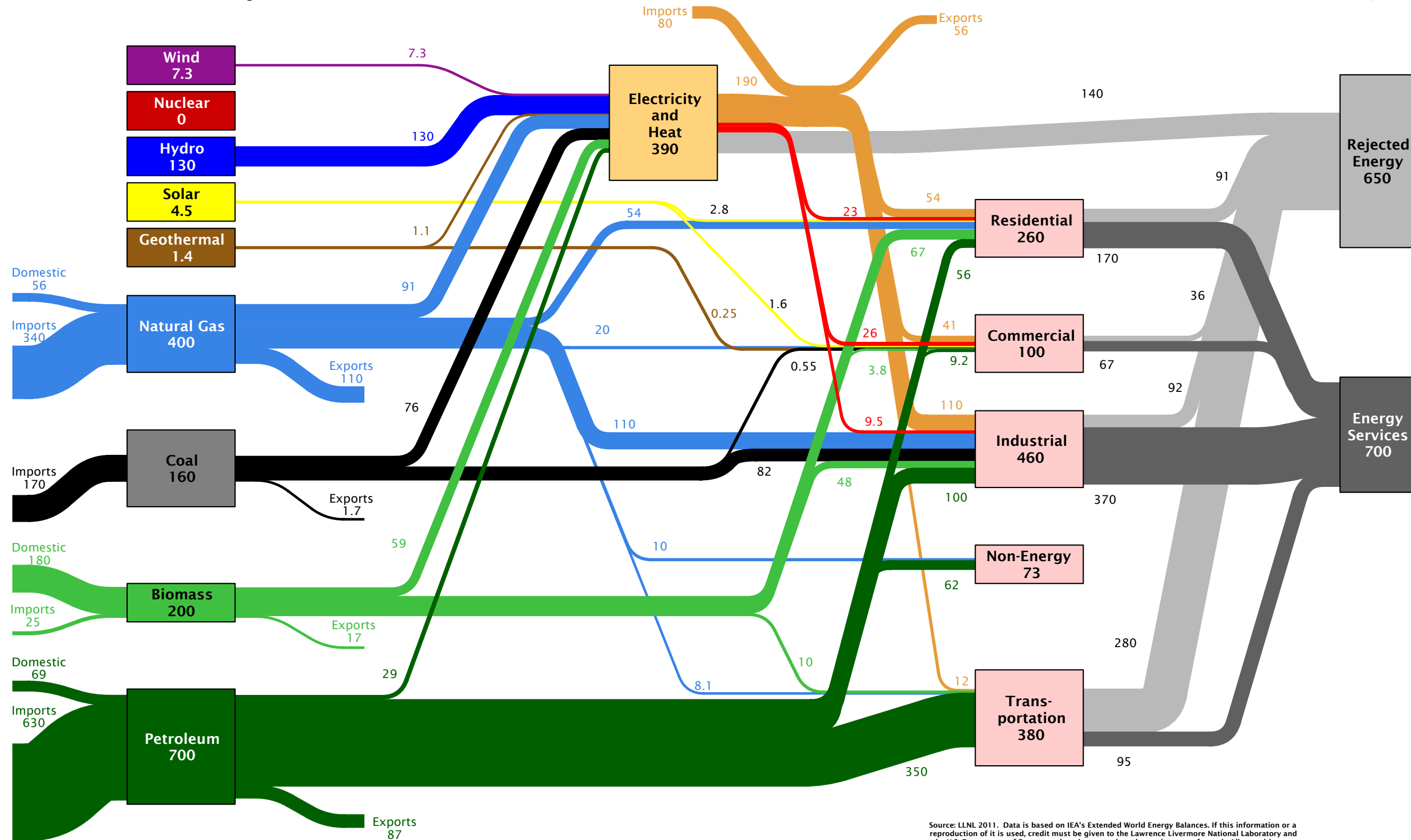
Australia Energy Flow  
in 2007: ~5700 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

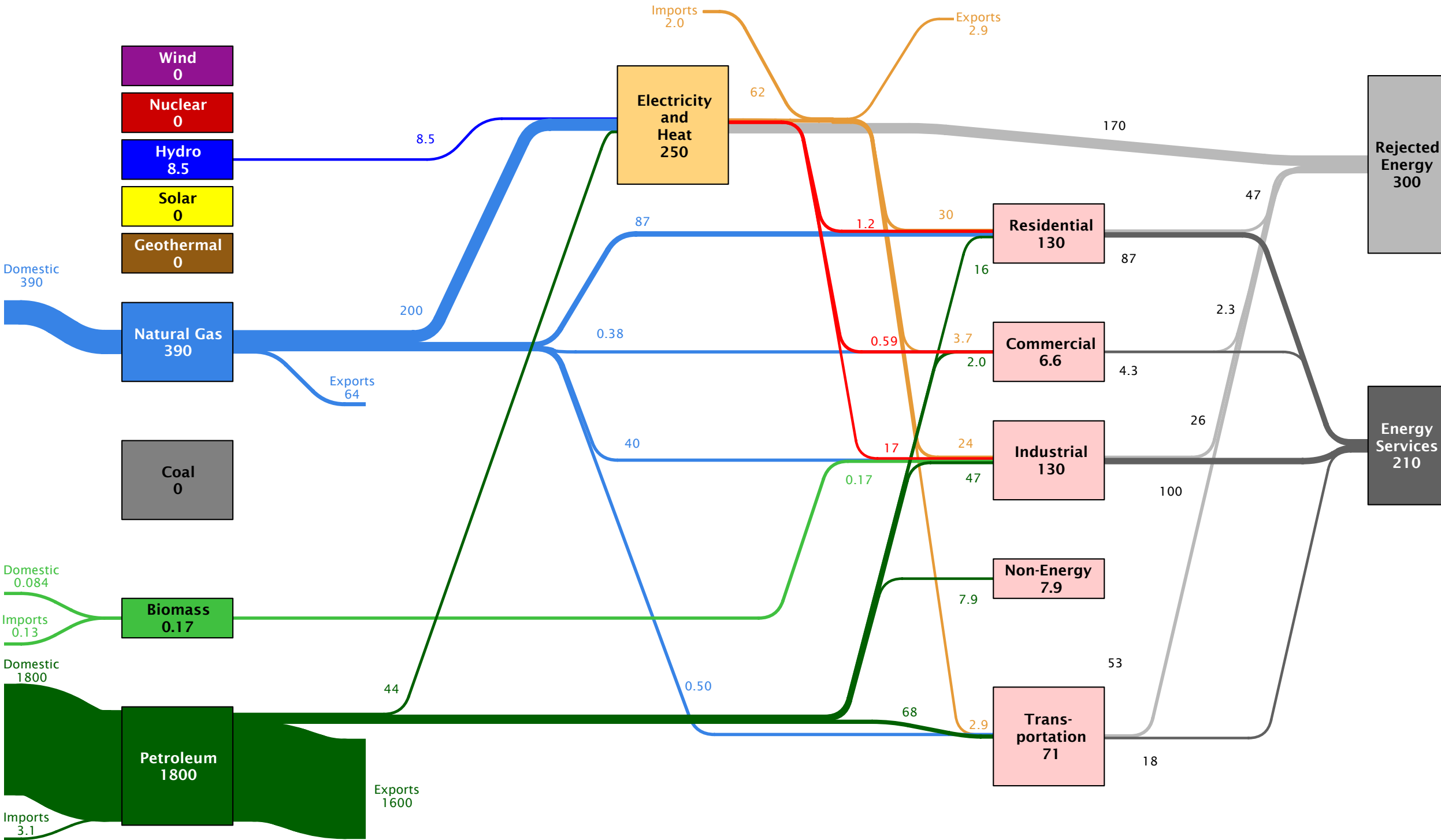


Austria Energy Flow  
in 2007: ~1400 PJ



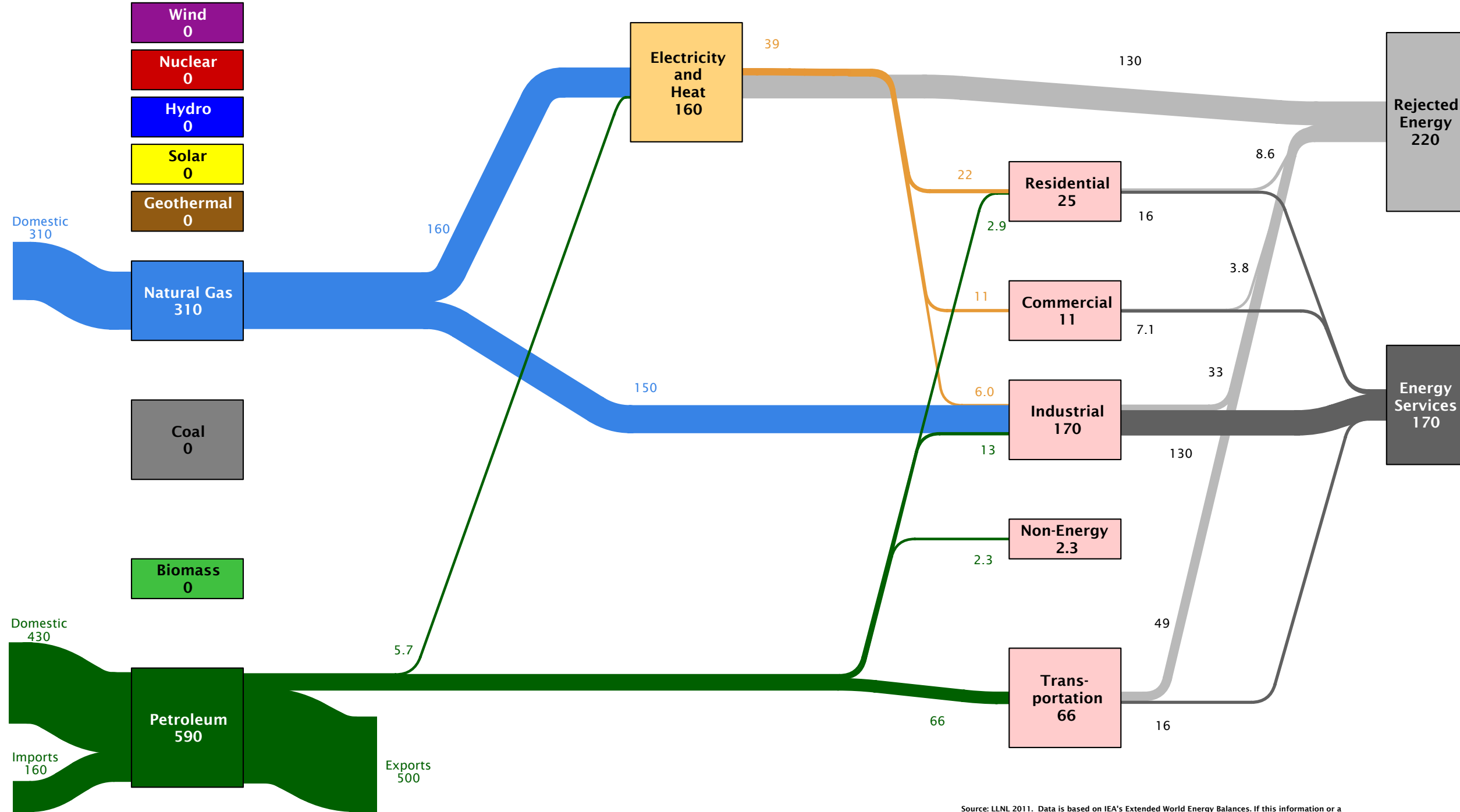
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Azerbaijan Energy Flow  
in 2007: ~520 PJ



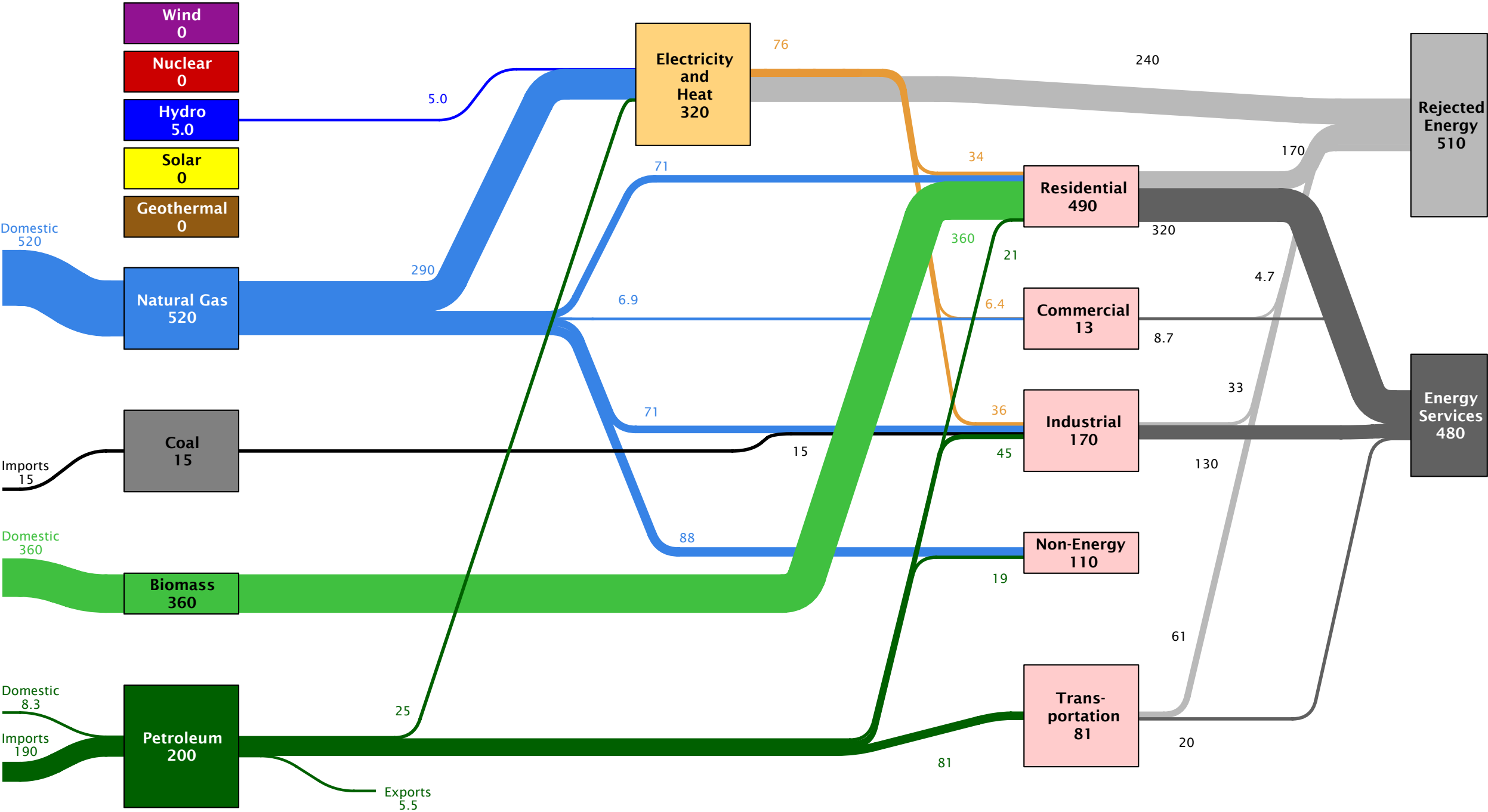
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Bahrain Energy Flow  
in 2007: ~400 PJ



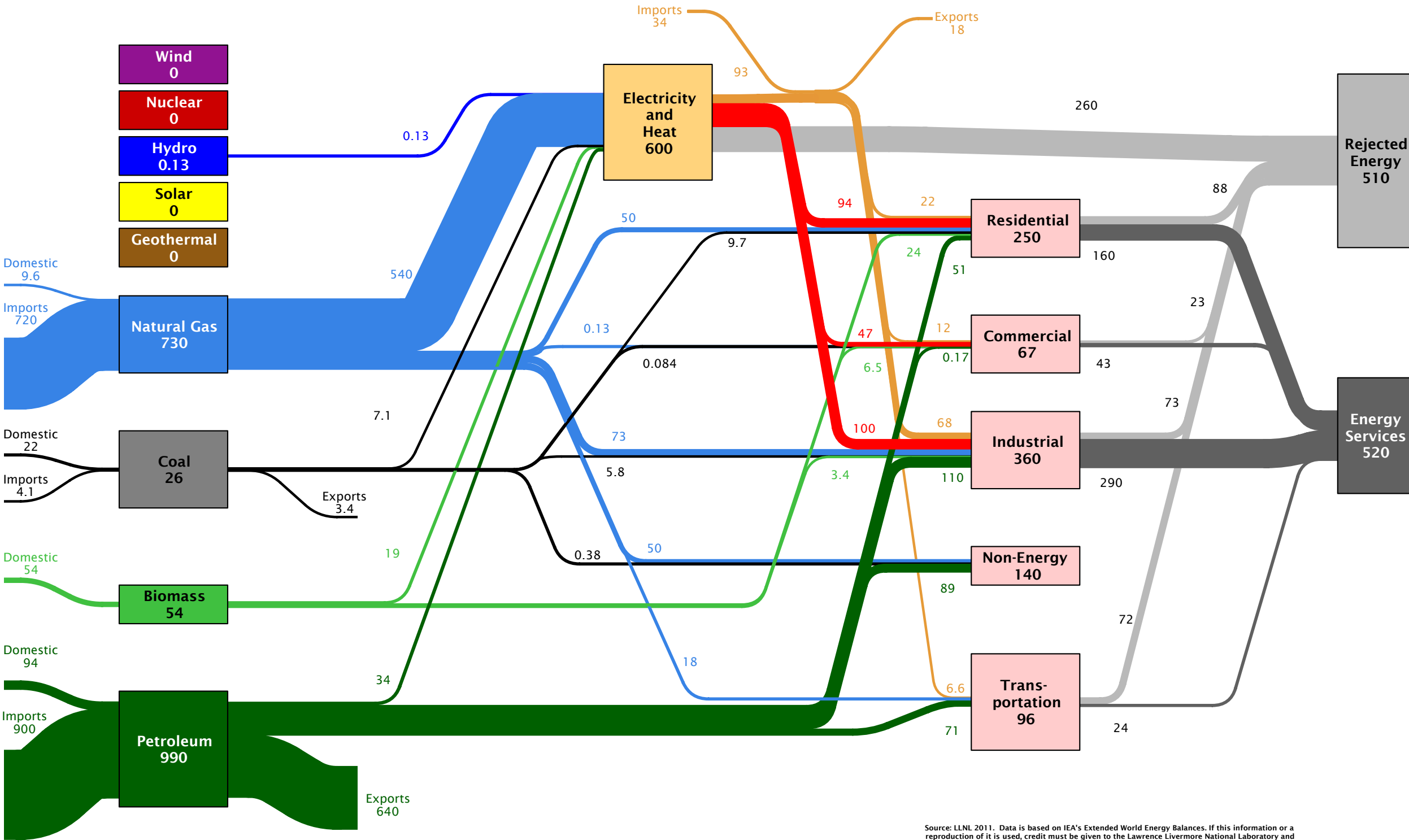
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Bangladesh Energy Flow  
in 2007: ~1100 PJ



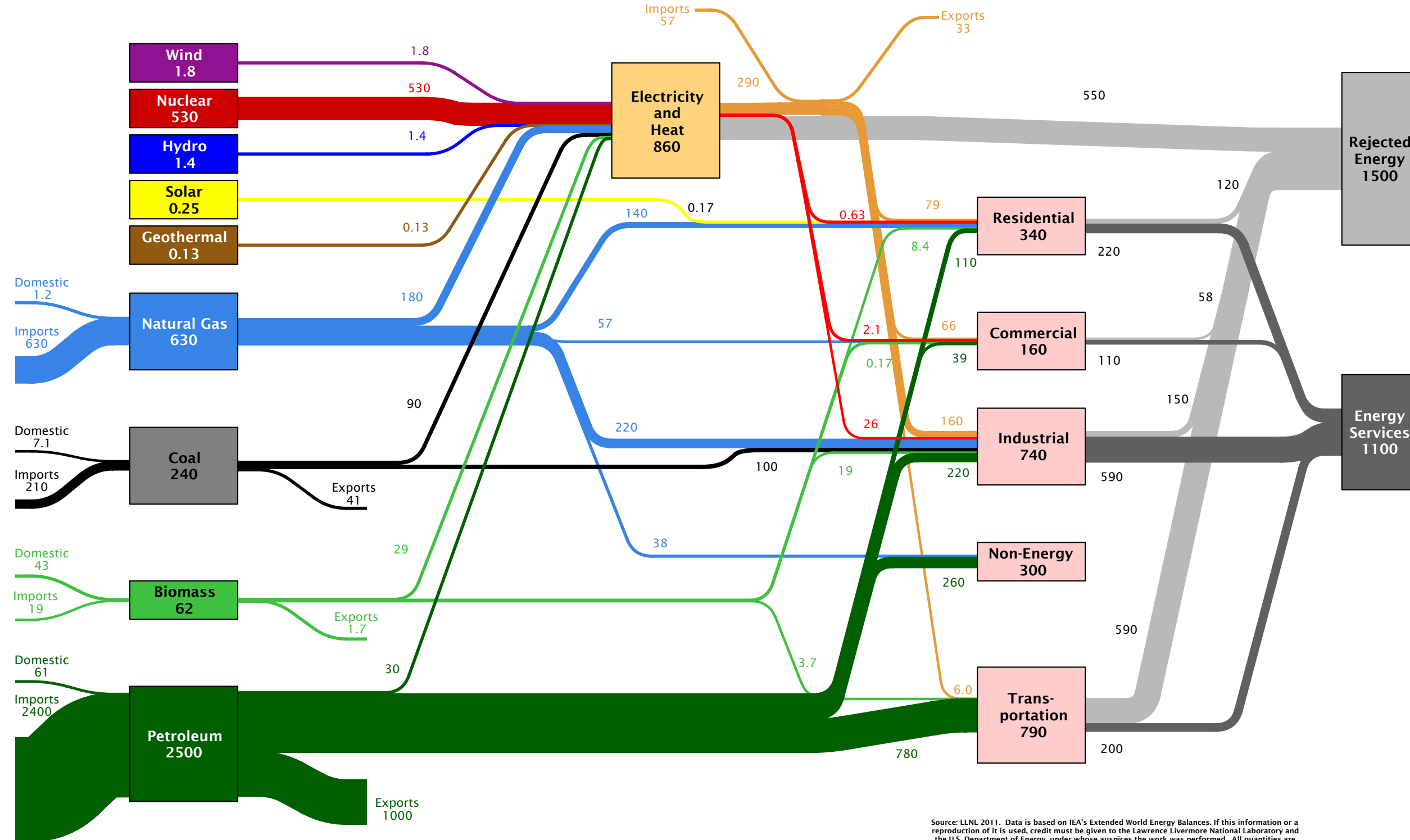
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Belarus Energy Flow  
in 2007: ~1200 PJ



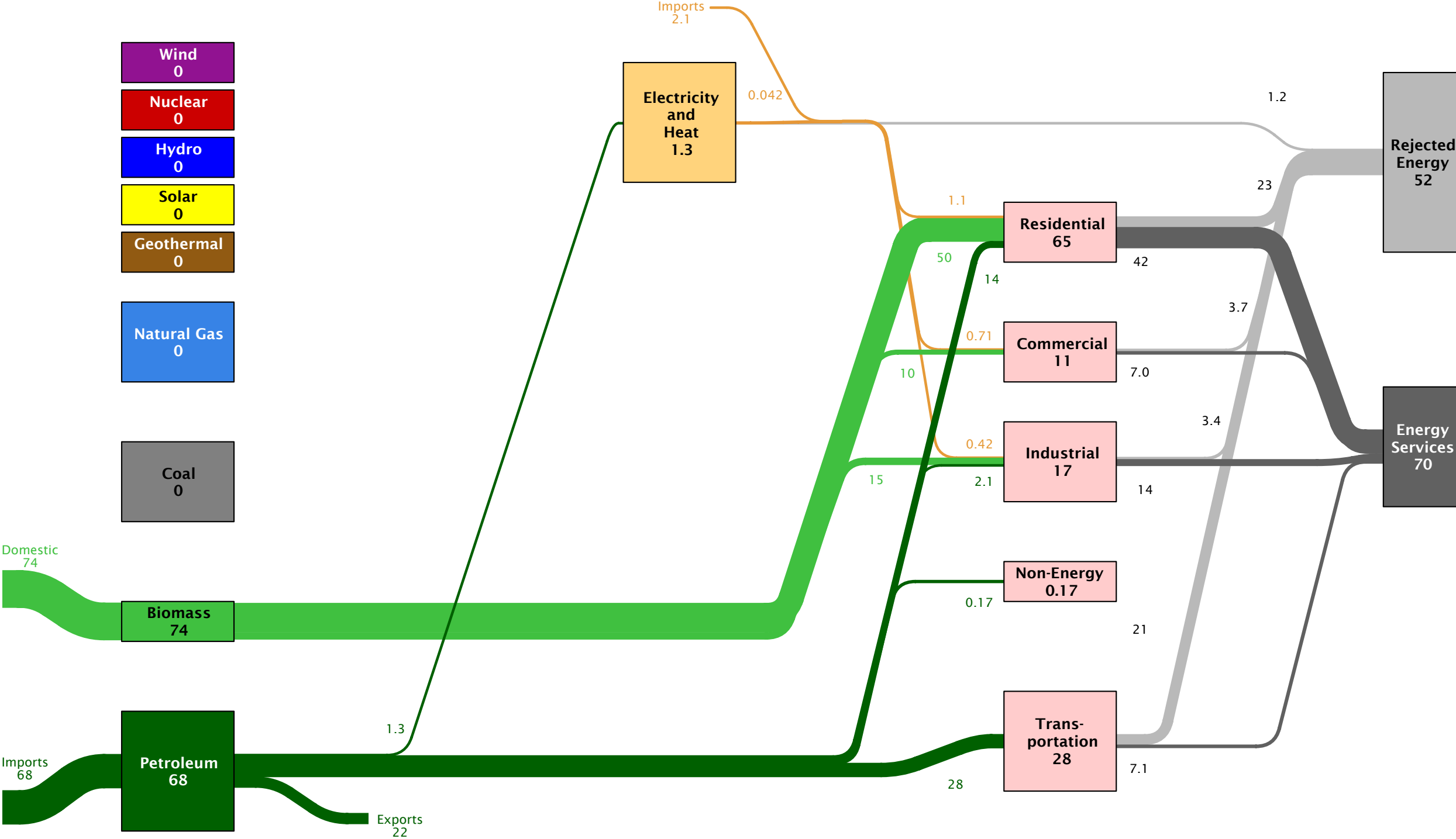
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Belgium Energy Flow  
in 2007: ~2900 PJ



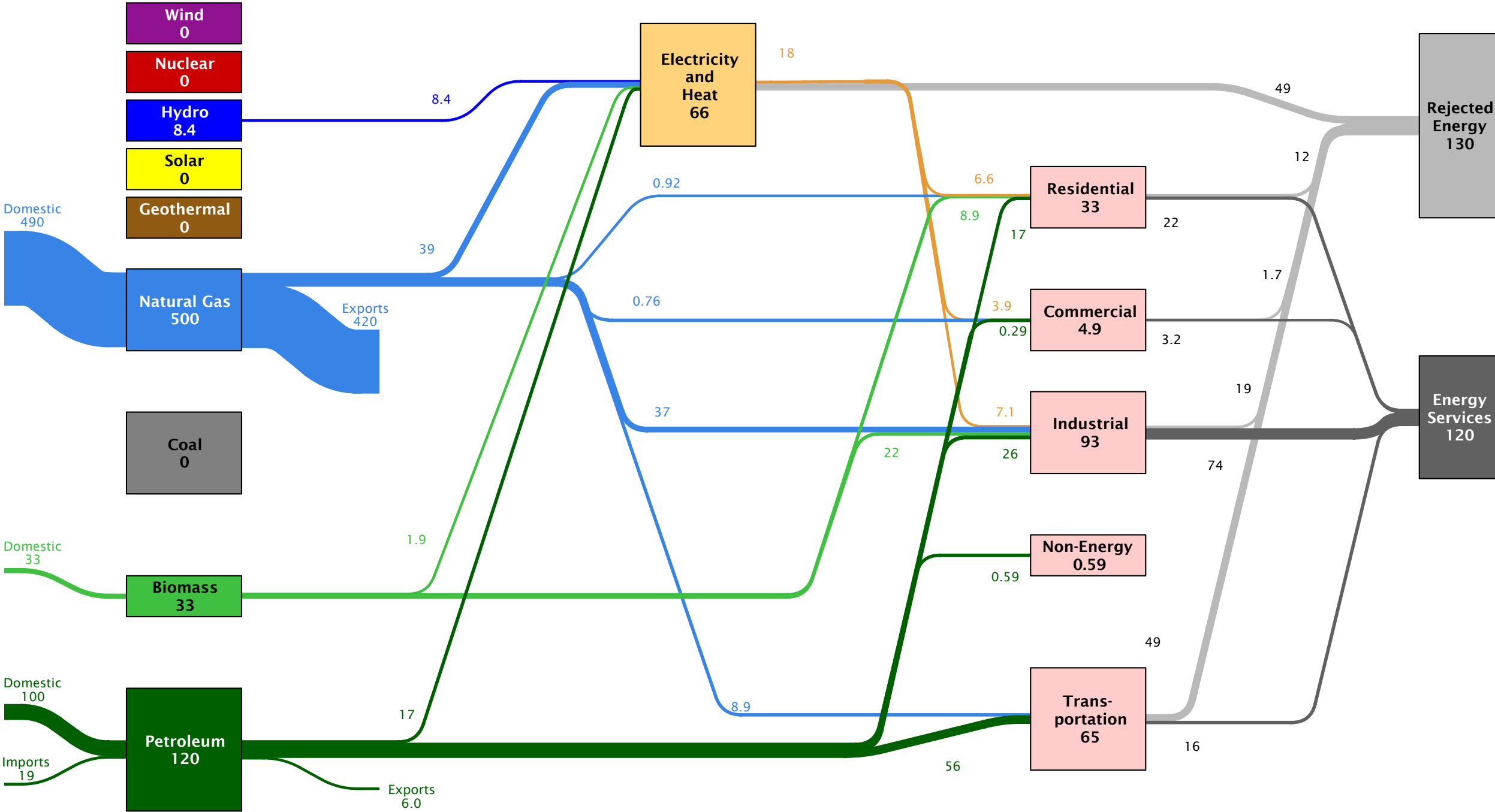
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Benin Energy Flow  
in 2007: ~120 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

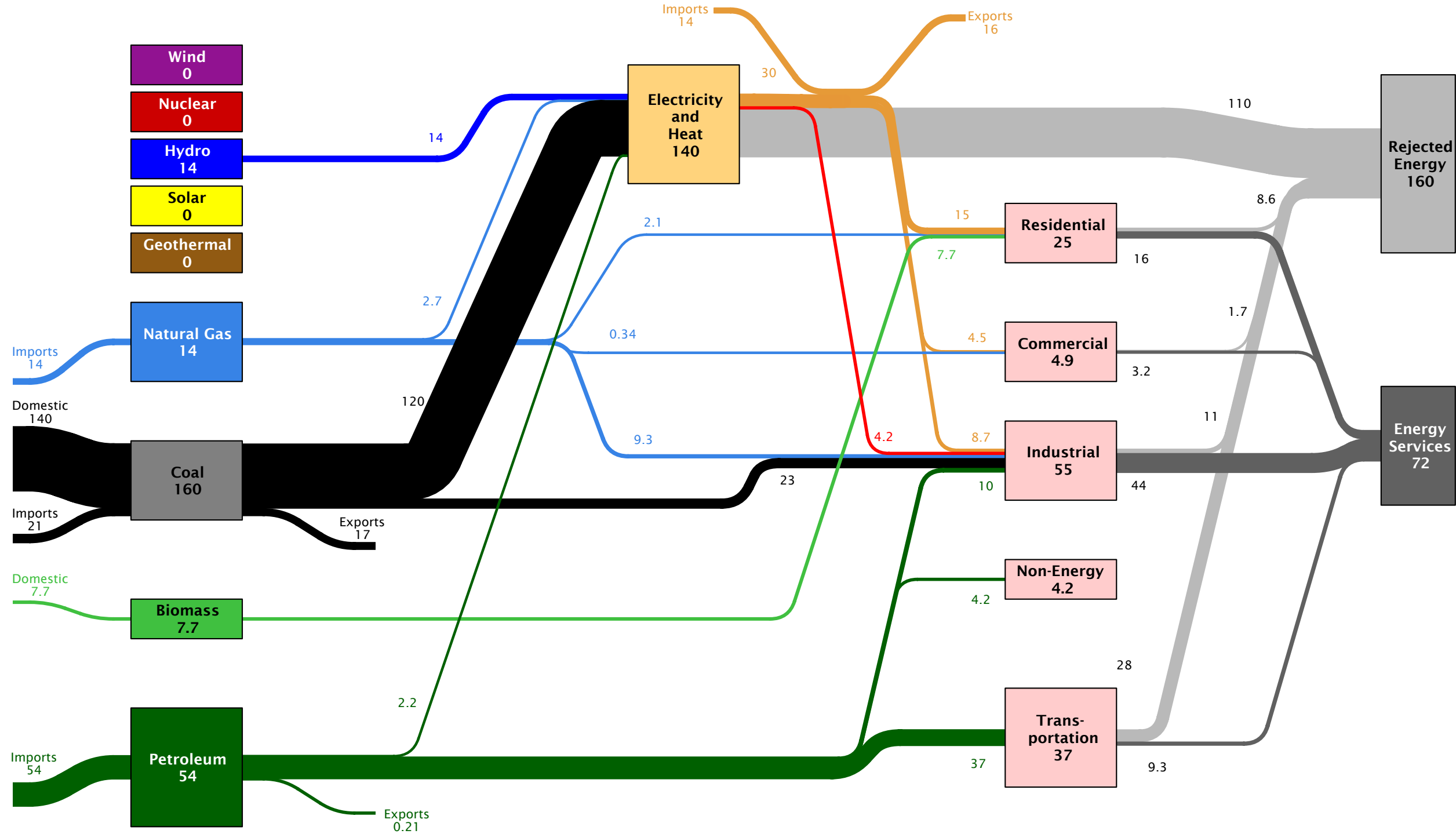
Bolivia Energy Flow  
in 2007: ~250 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

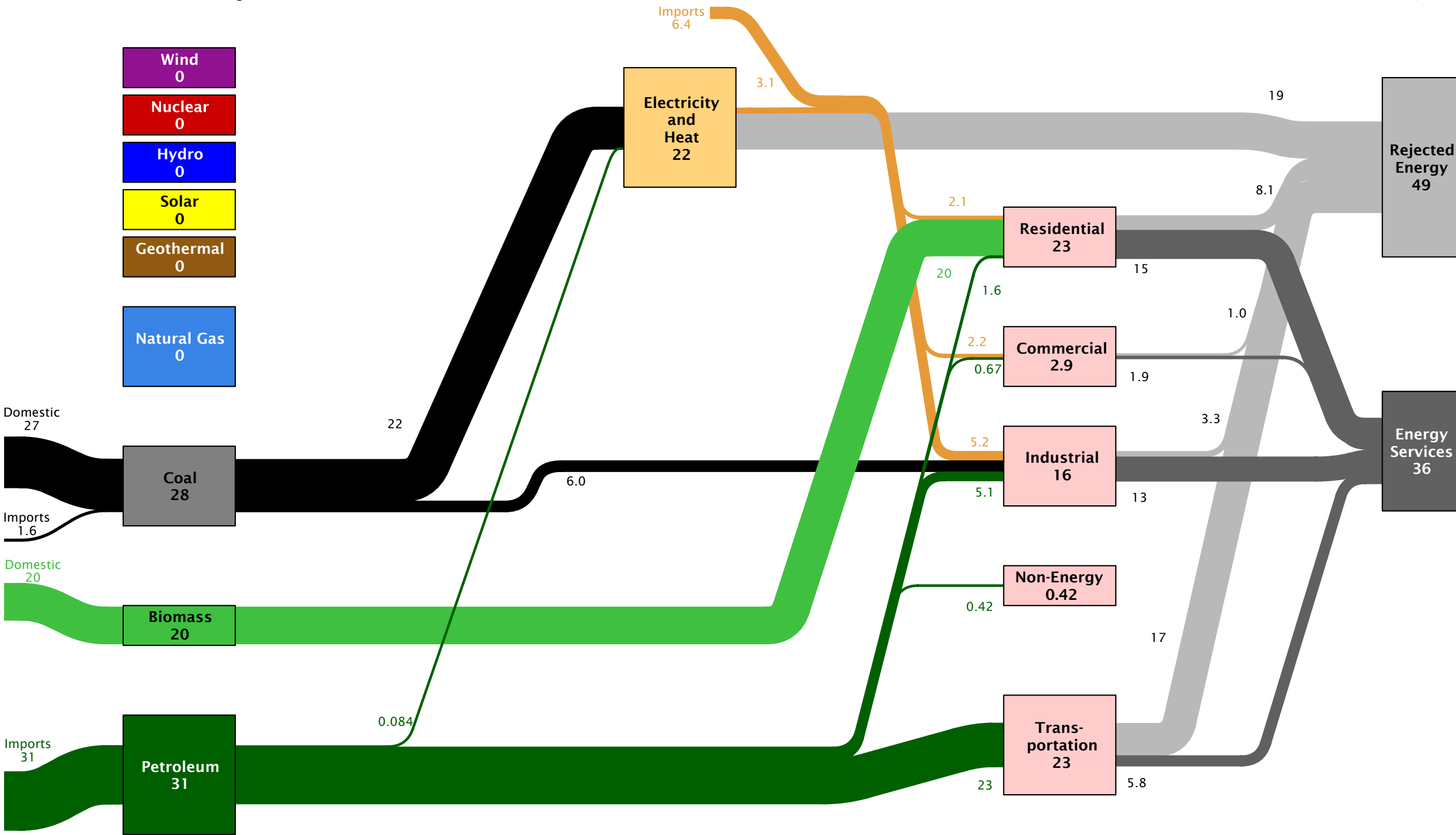


Bosnia and Herzegovina Energy Flow  
in 2007: ~240 PJ



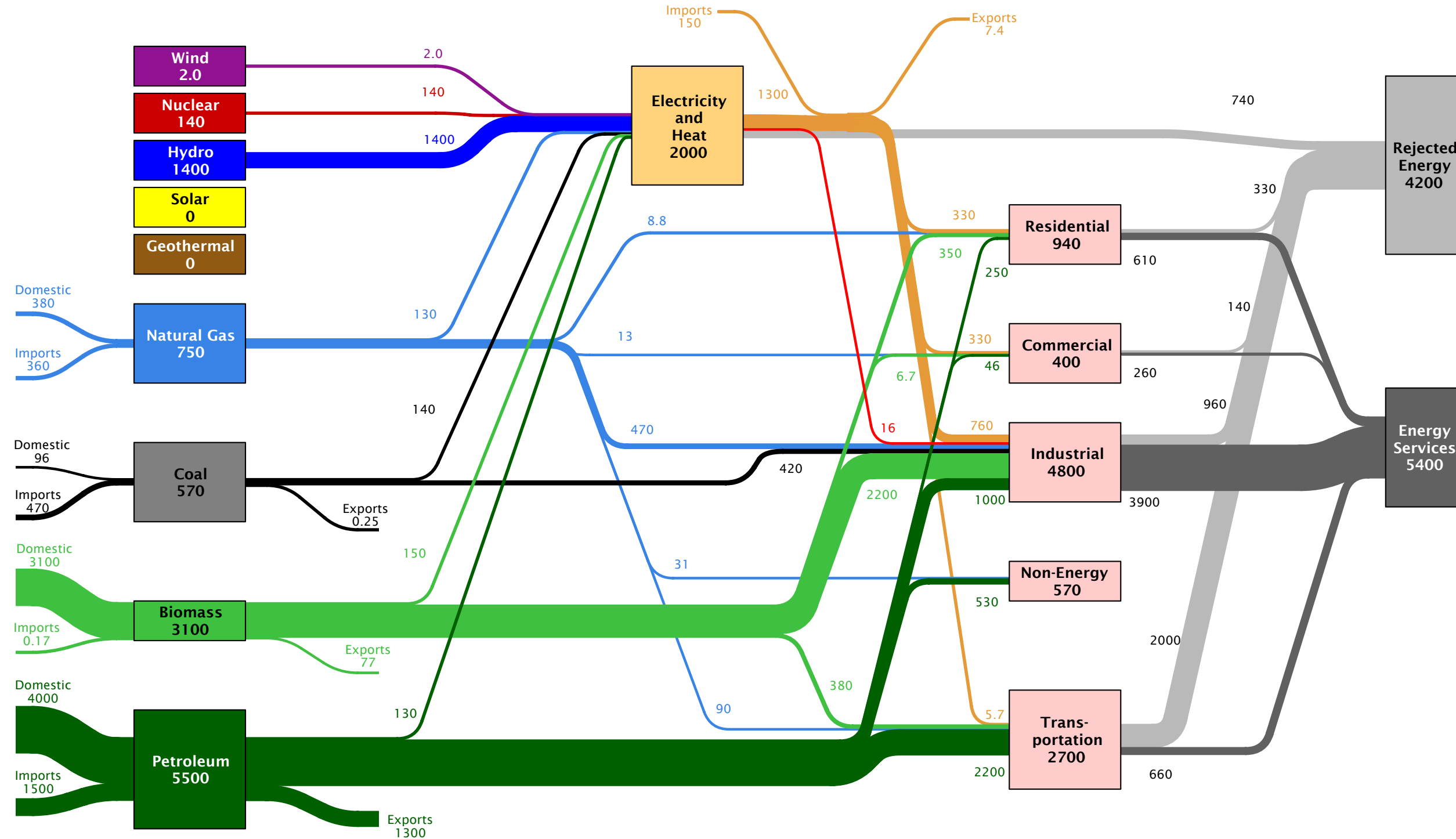
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Botswana Energy Flow  
in 2007: ~85 PJ



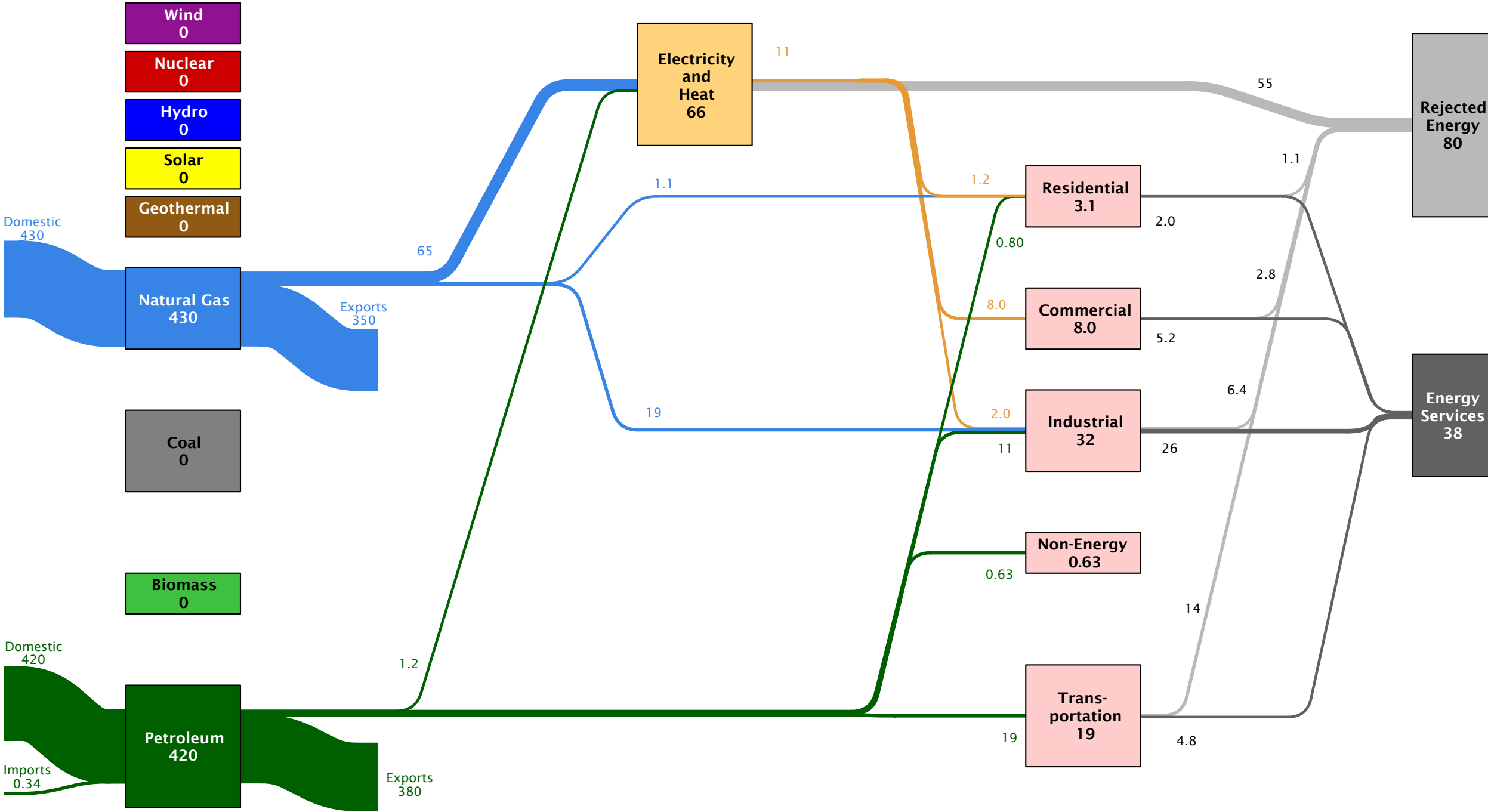
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Brazil Energy Flow  
in 2007: ~10000 PJ



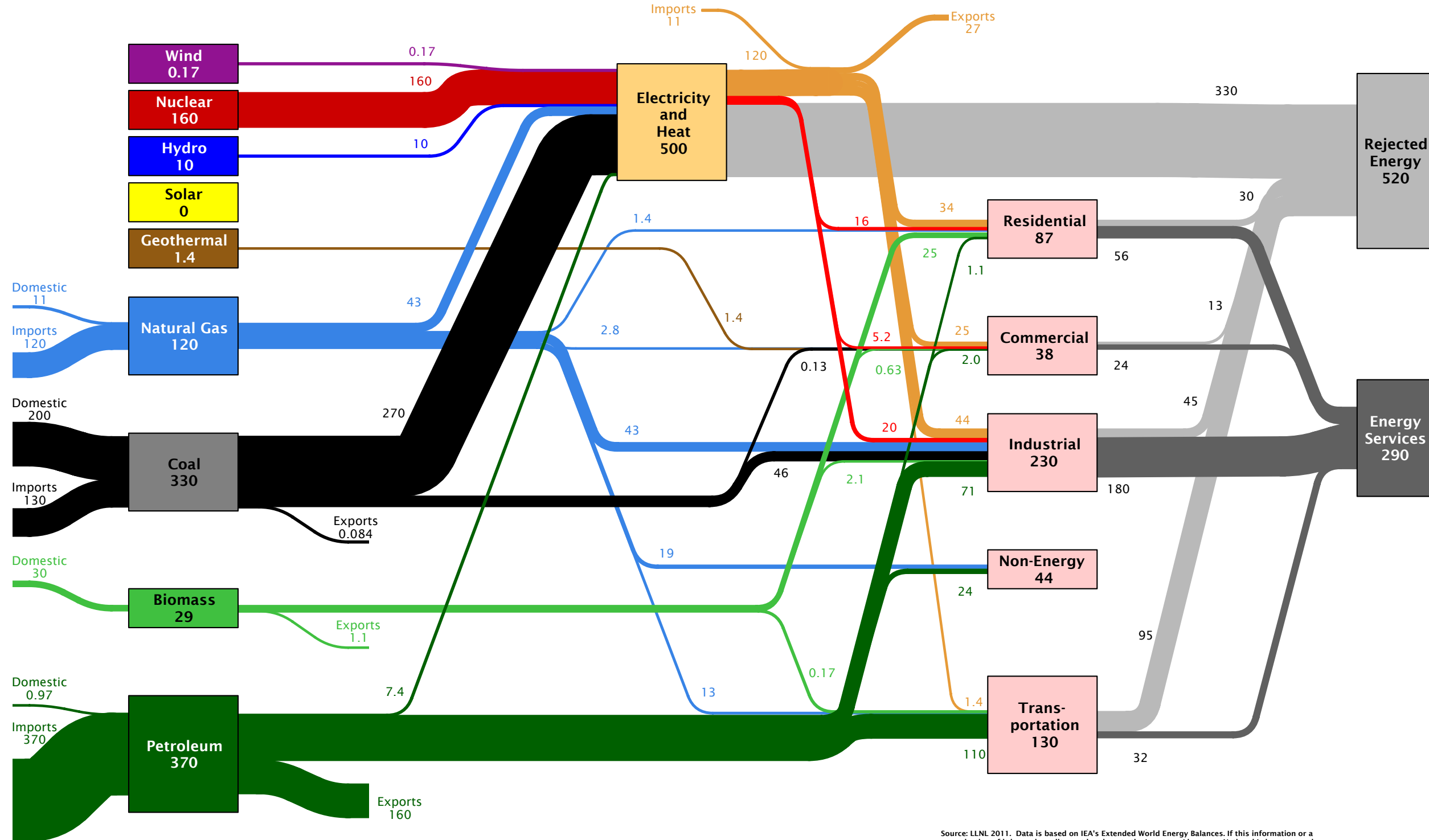
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Brunei Darussalam Energy Flow  
in 2007: ~120 PJ



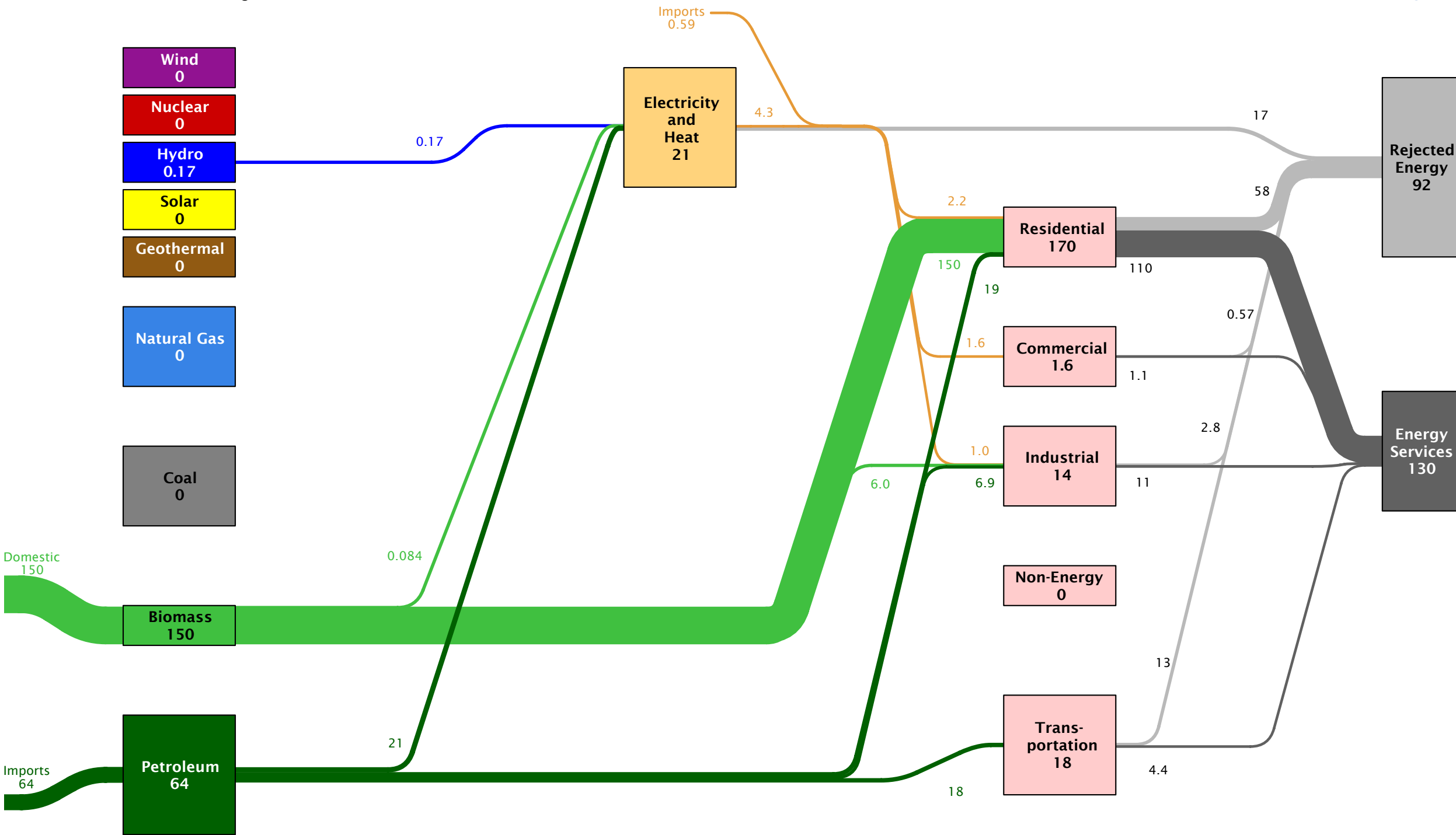
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Bulgaria Energy Flow  
in 2007: ~860 PJ



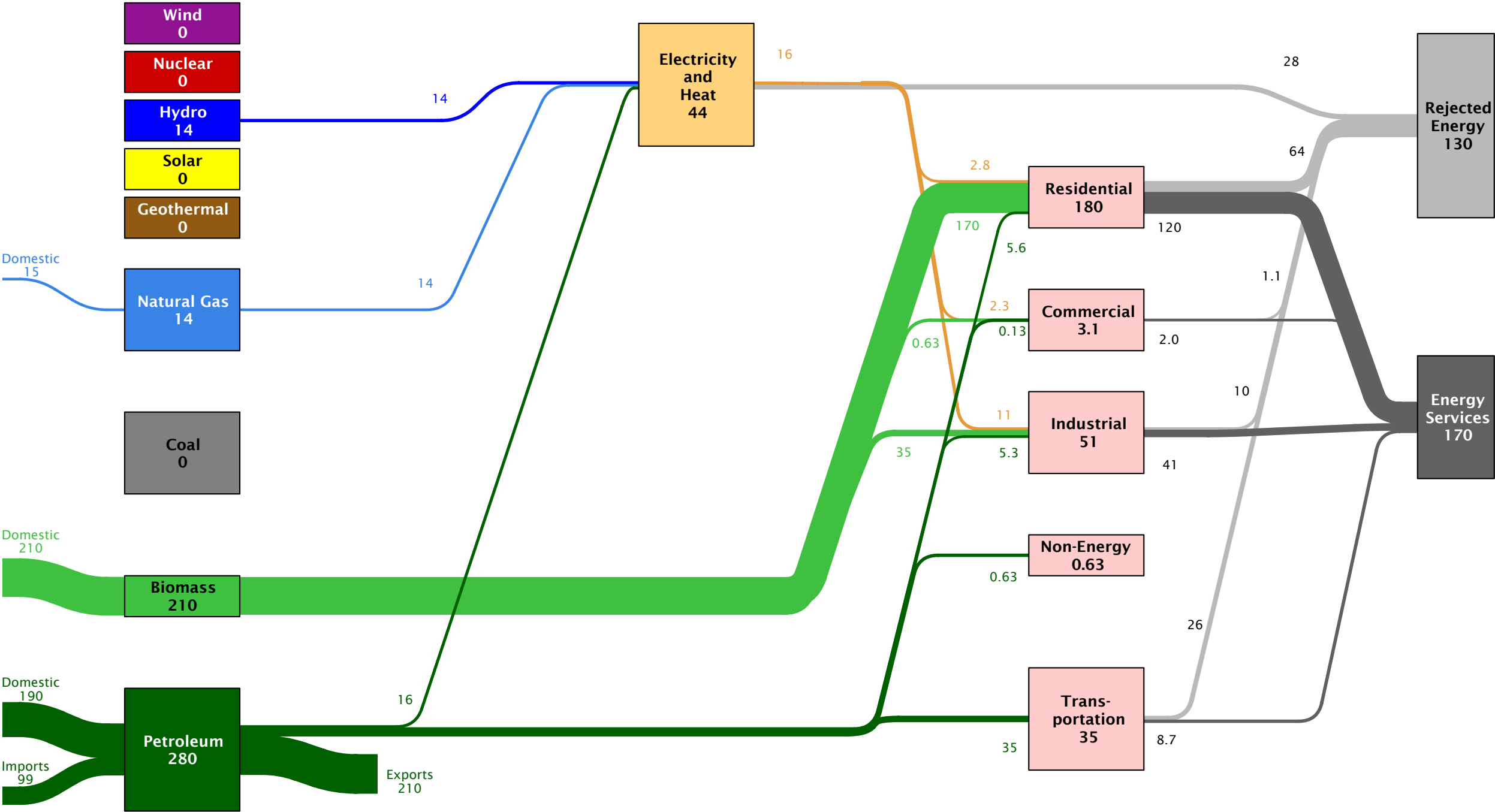
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Cambodia Energy Flow  
in 2007: ~220 PJ



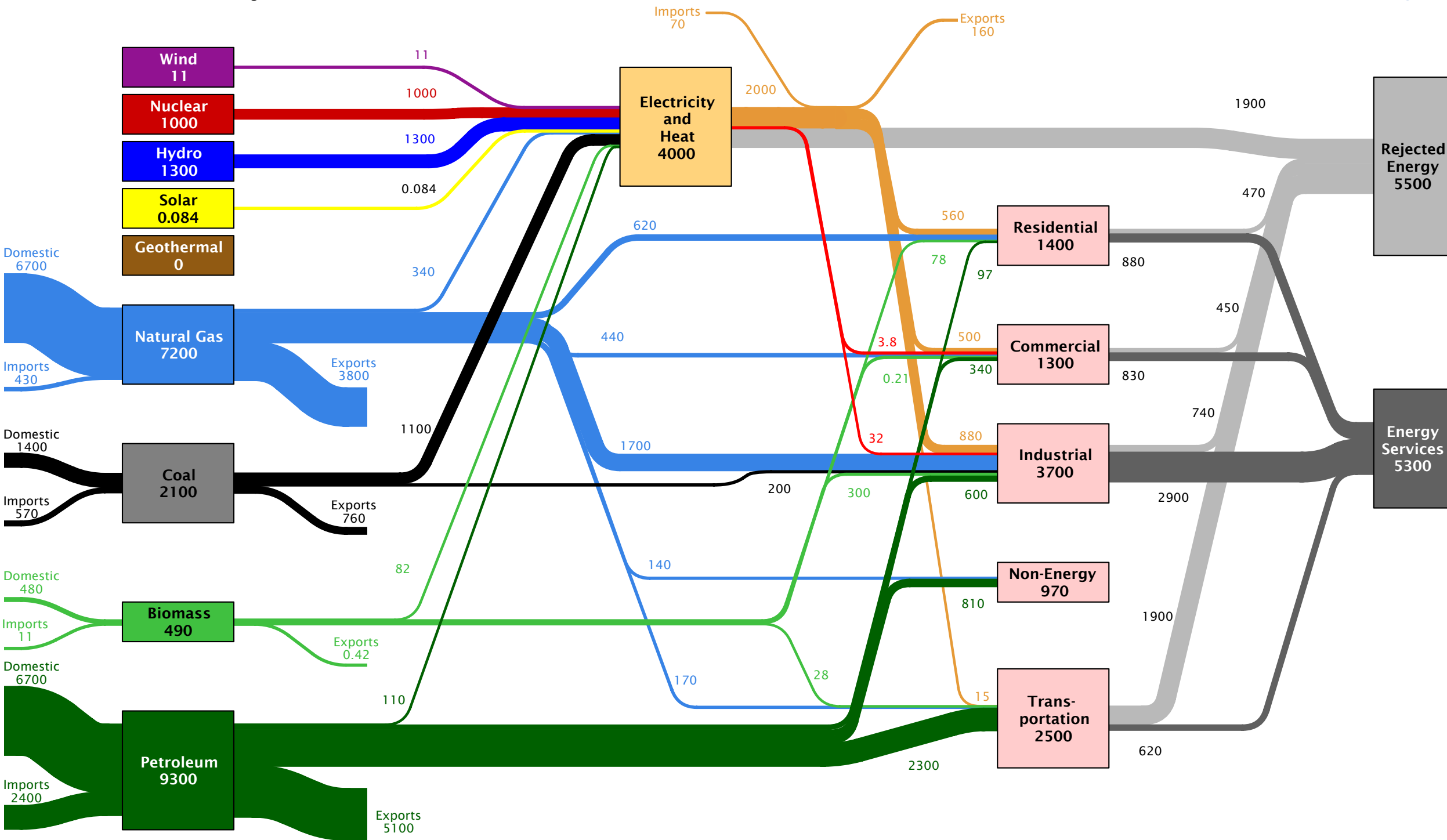
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Cameroon Energy Flow  
in 2007: ~300 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

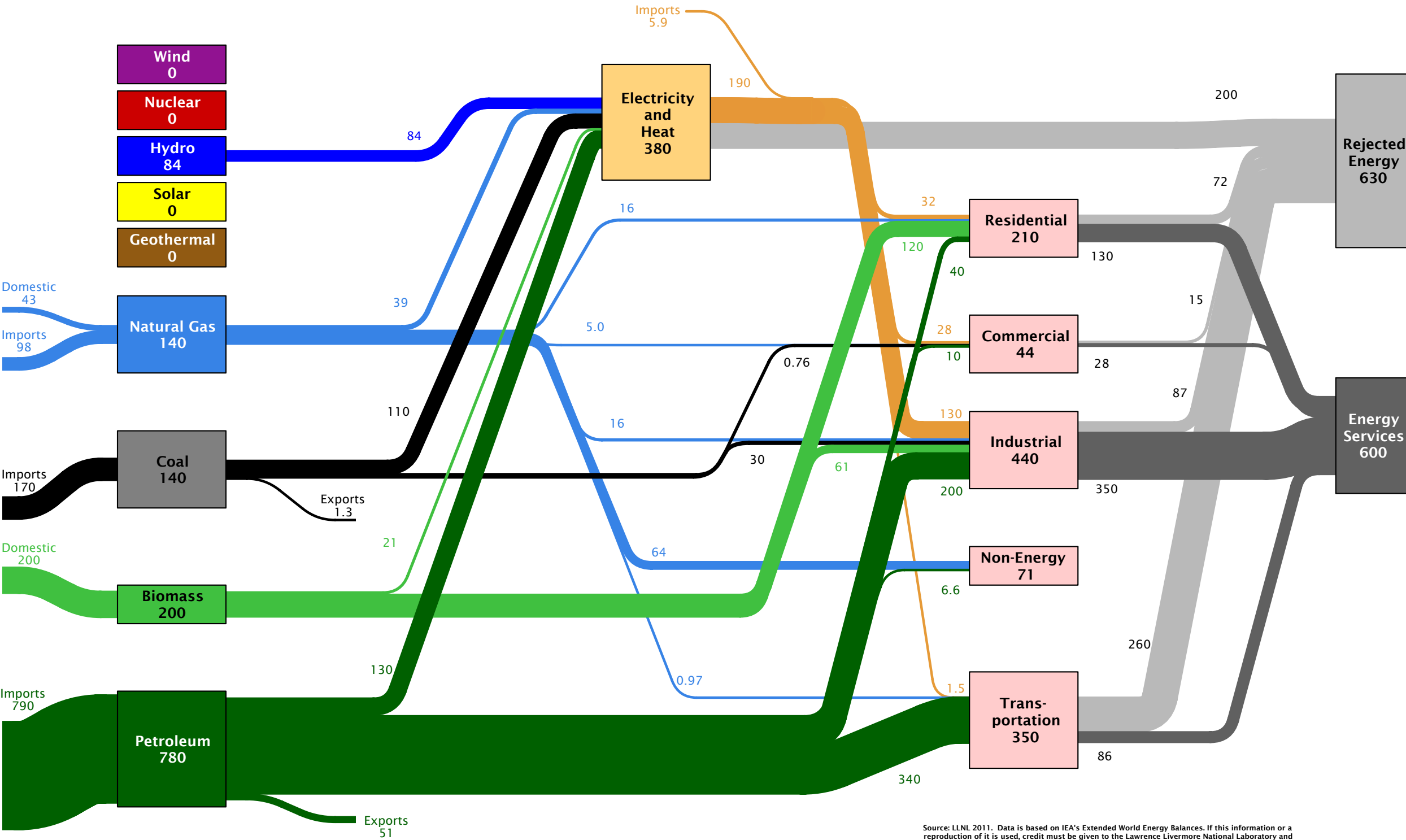
Canada Energy Flow  
in 2007: ~12000 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

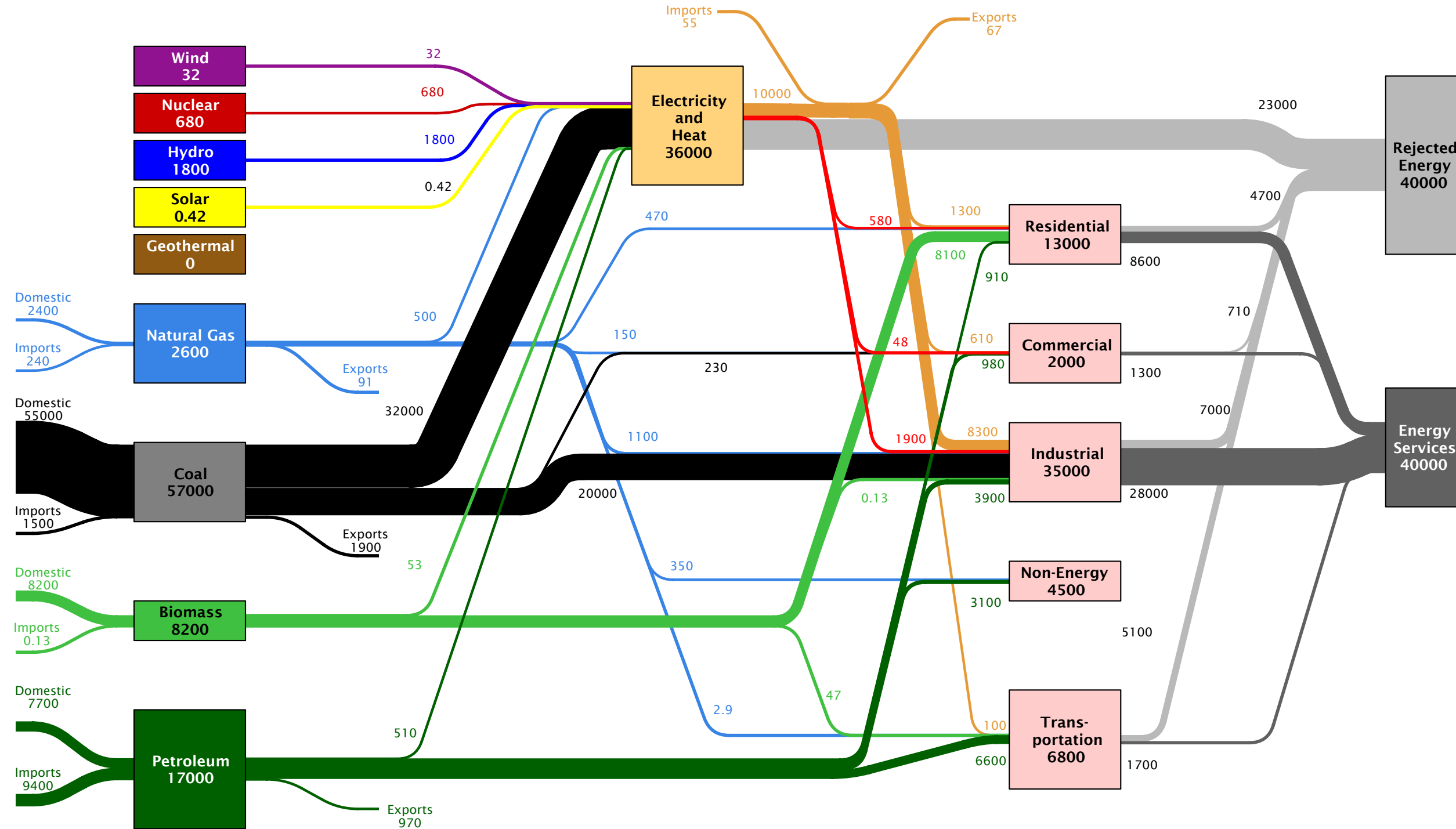


Chile Energy Flow  
in 2007: ~1300 PJ



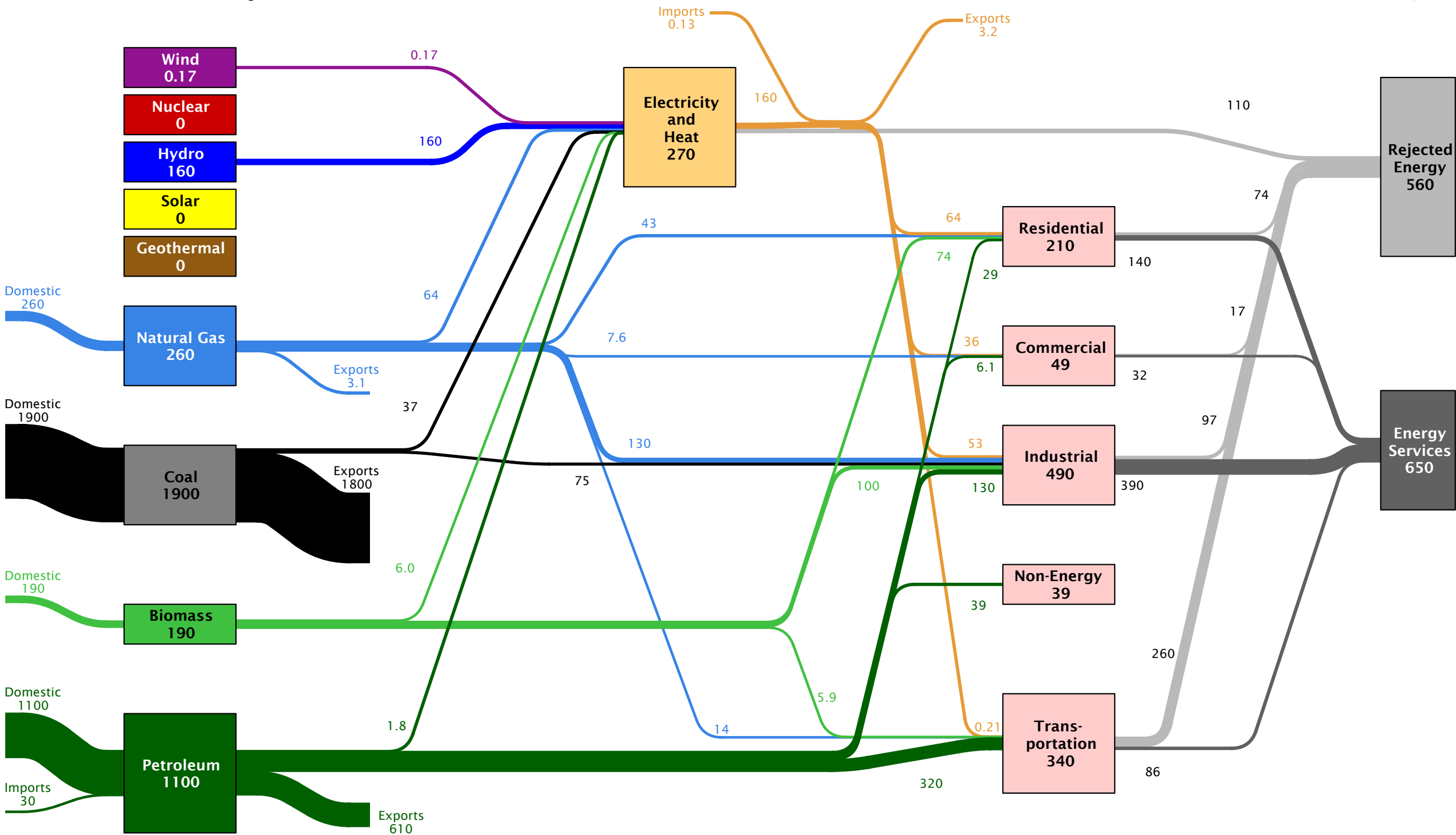
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

China Energy Flow  
in 2007: ~85000 PJ



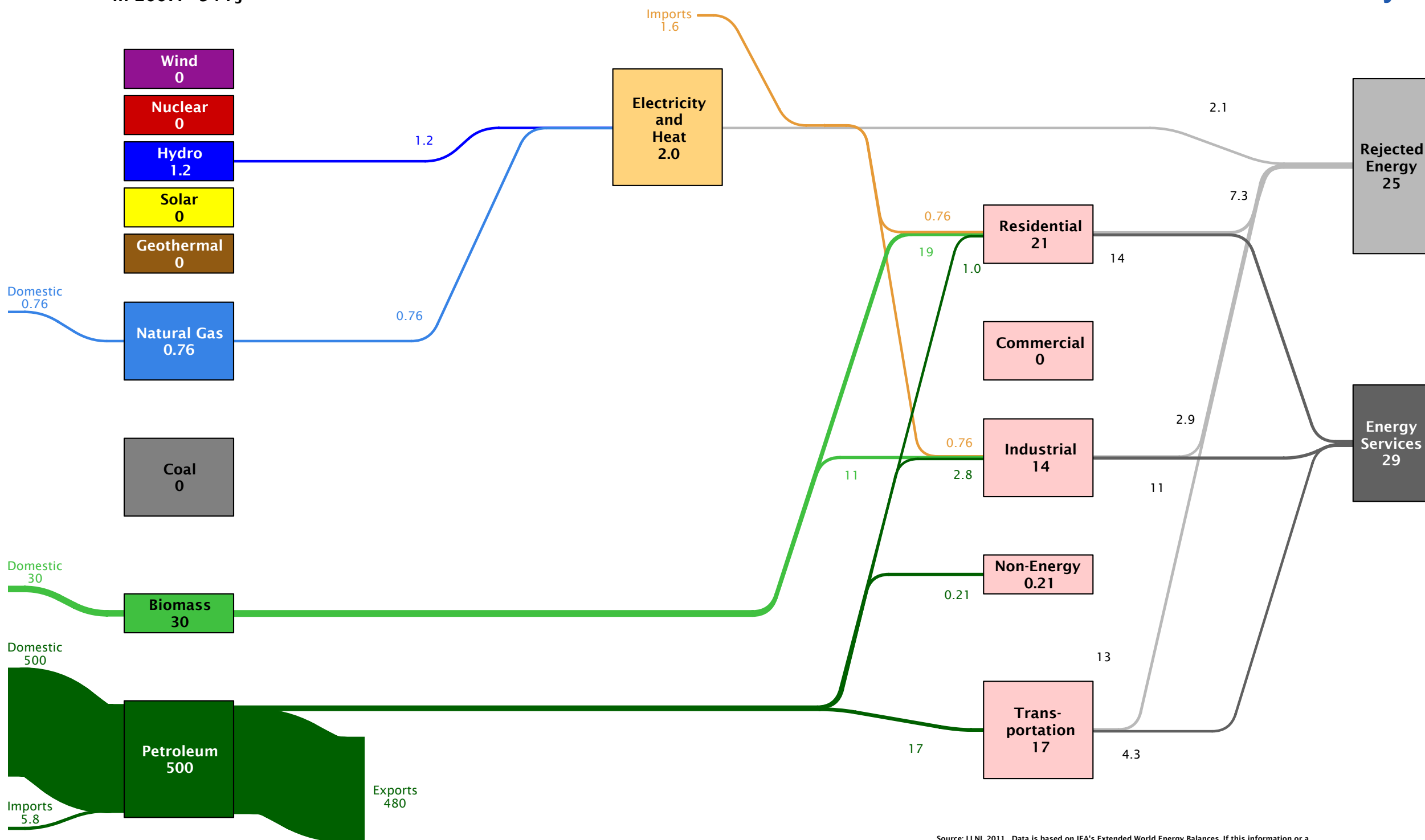
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Colombia Energy Flow  
in 2007: ~1200 PJ



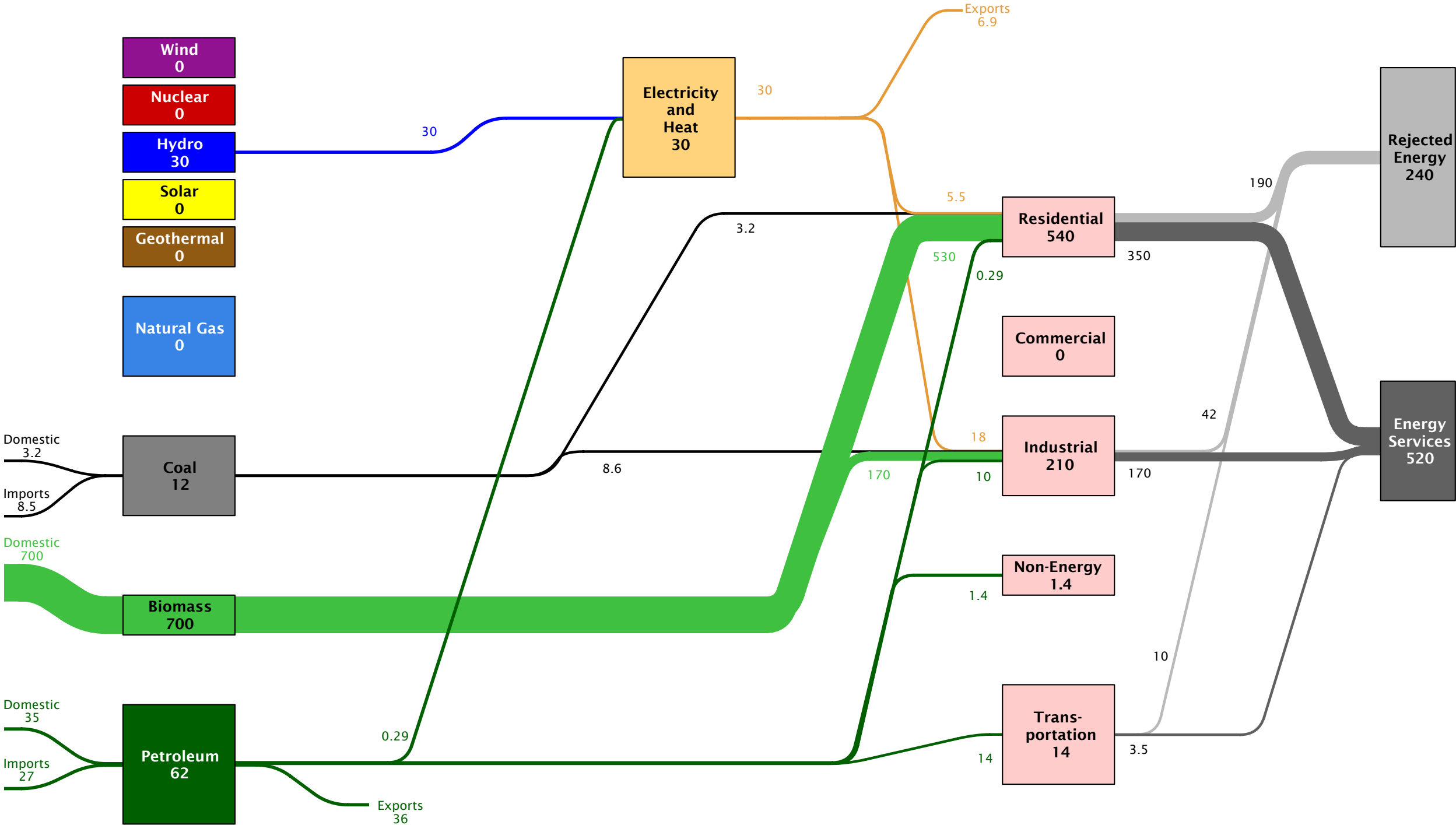
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Congo Energy Flow in 2007: ~54 PJ



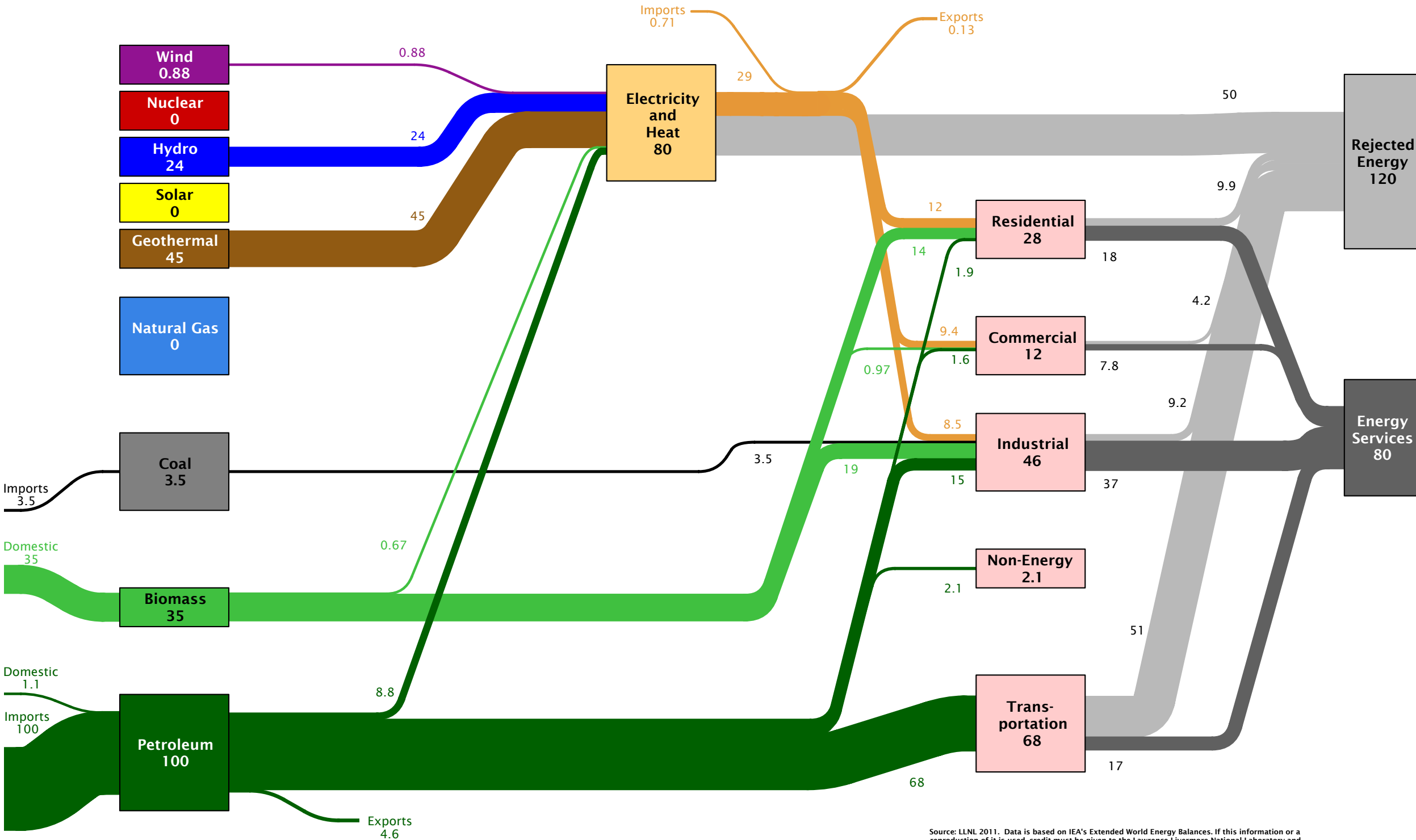
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Democratic Republic of the Congo  
Energy Flow in 2007: ~770 PJ



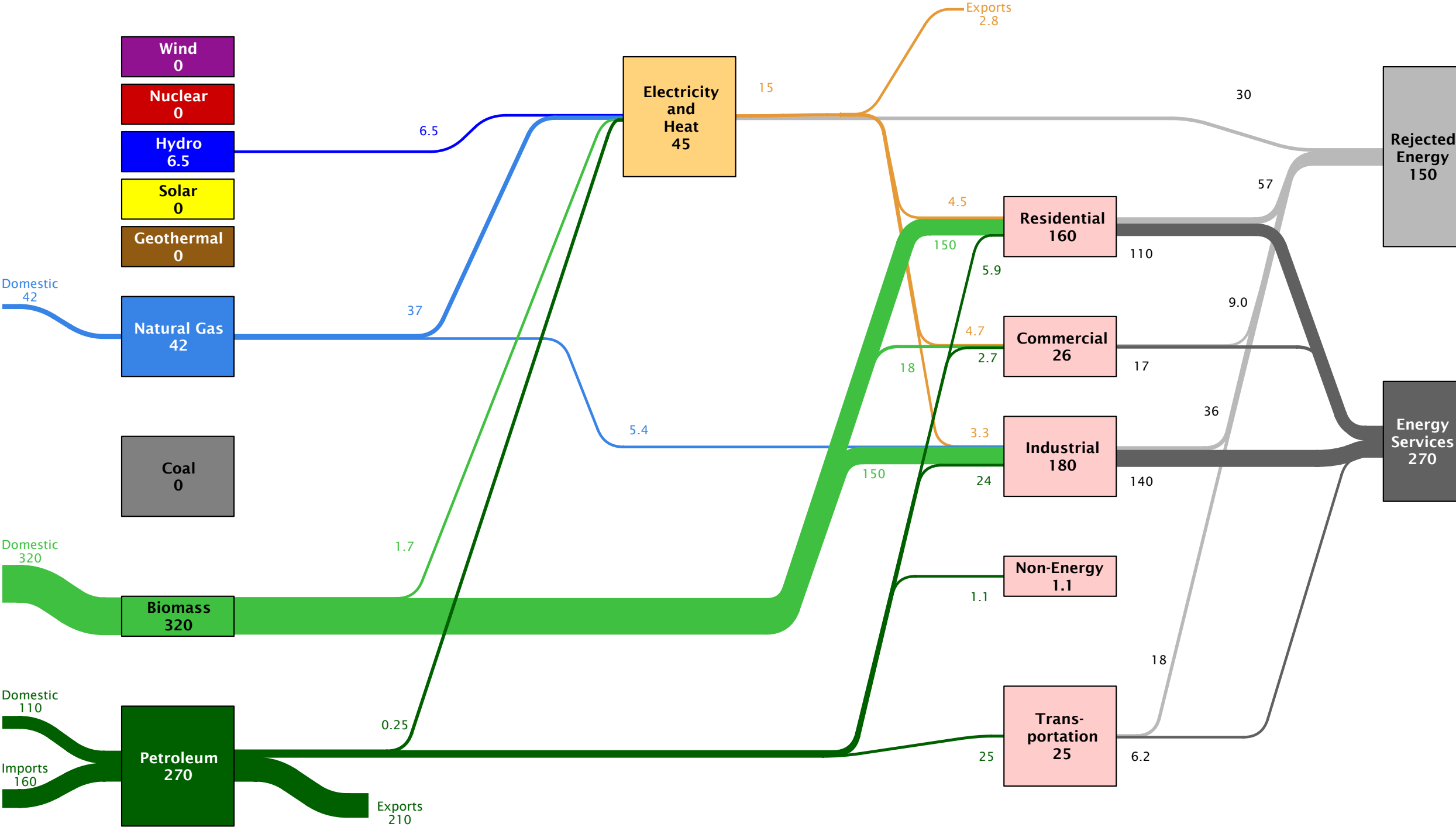
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Costa Rica Energy Flow  
in 2007: ~210 PJ



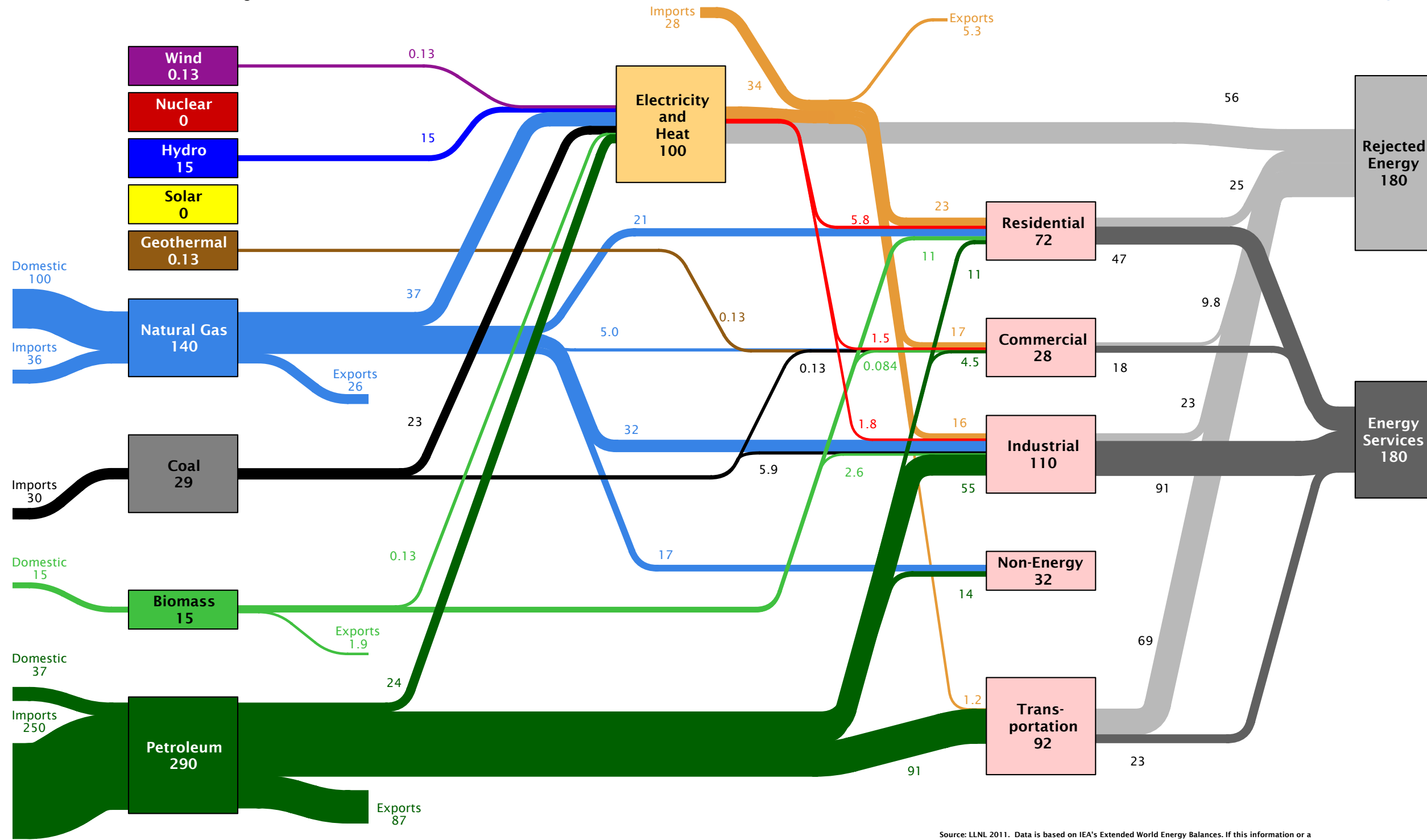
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Cote d'Ivoire Energy Flow  
in 2007: ~420 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

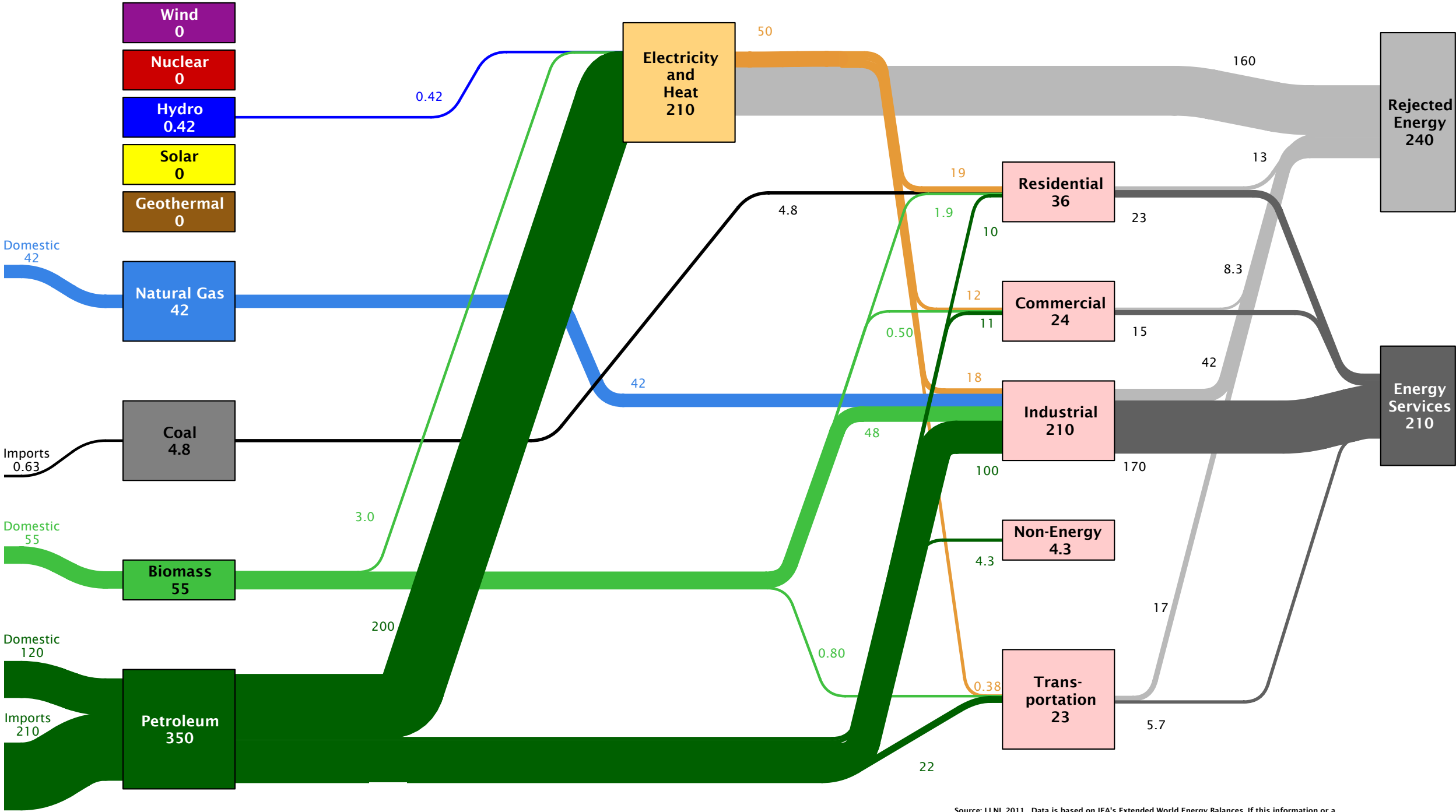
Croatia Energy Flow  
in 2007: ~390 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

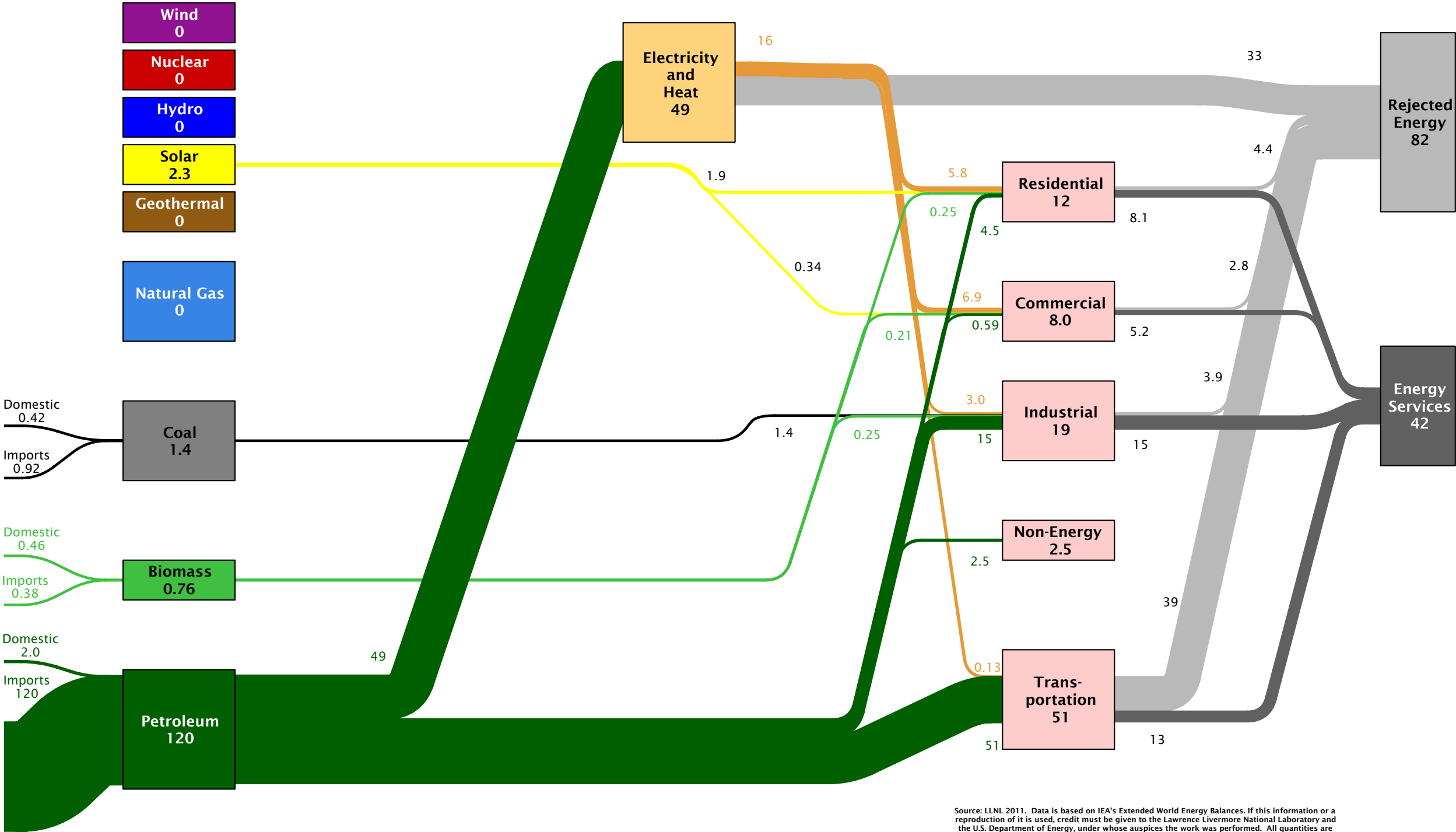


Cuba Energy Flow  
in 2007: ~450 PJ



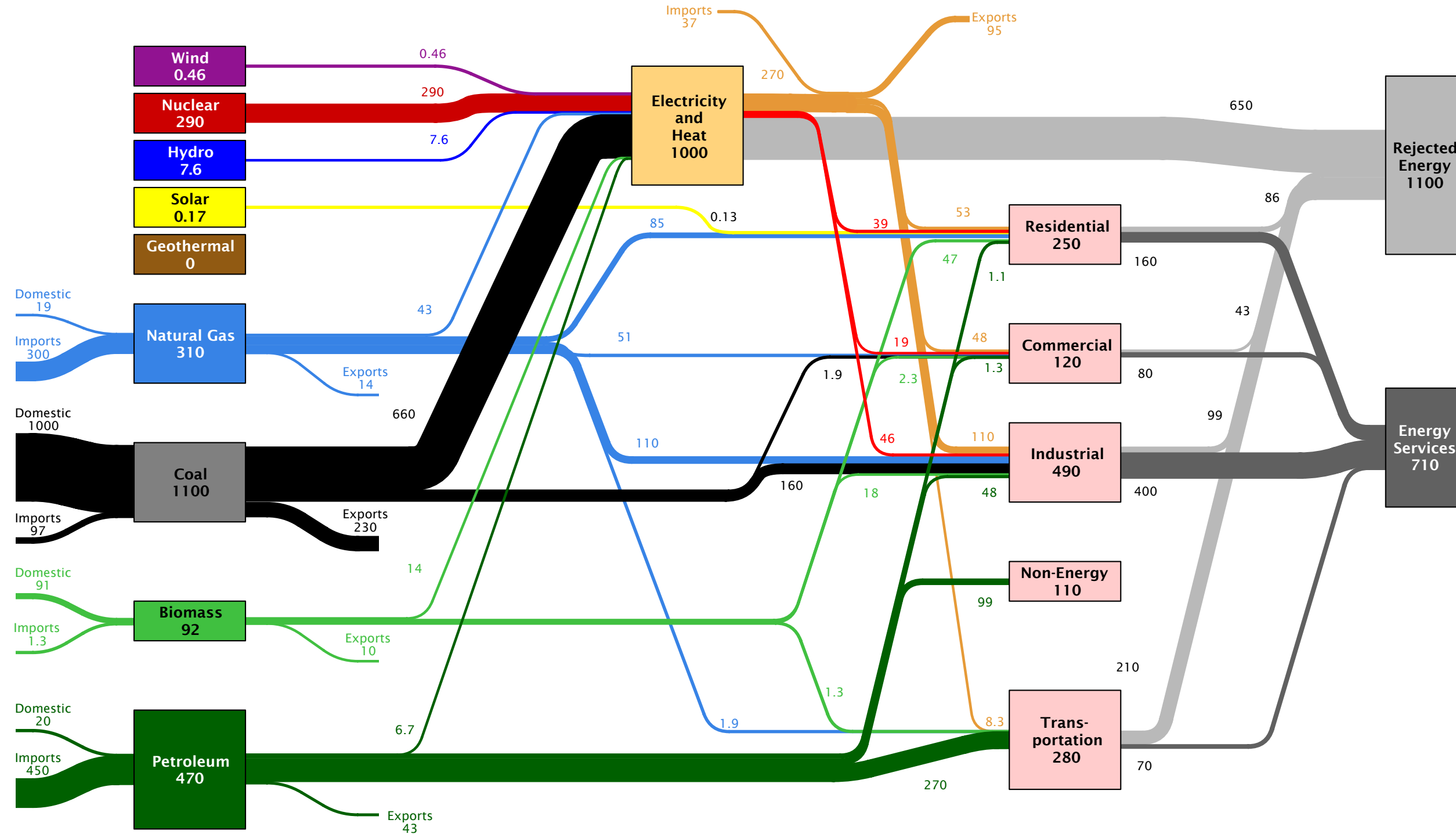
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Cyprus Energy Flow  
in 2007: ~130 PJ



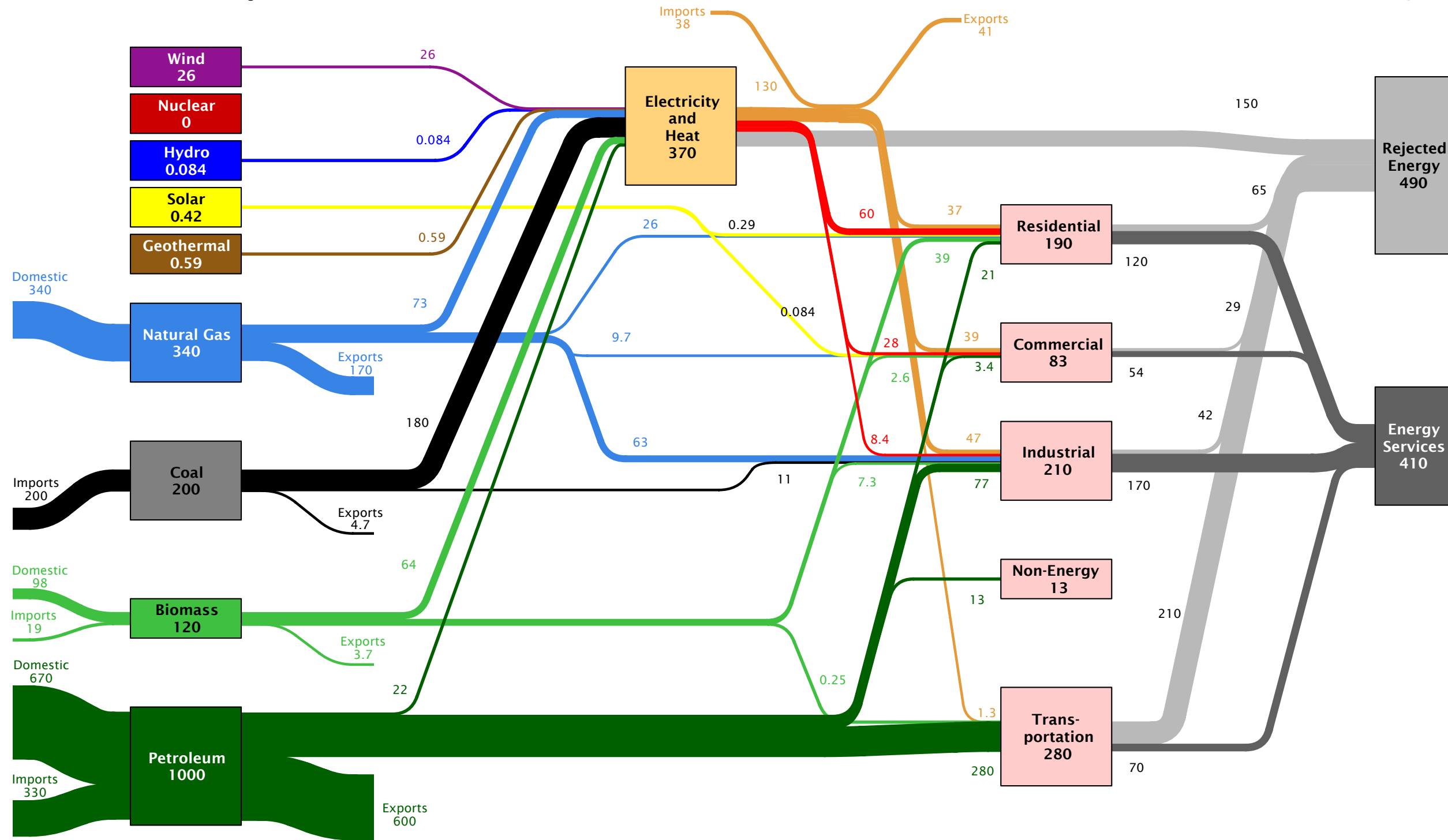
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Czech Republic Energy Flow  
in 2007: ~1900 PJ



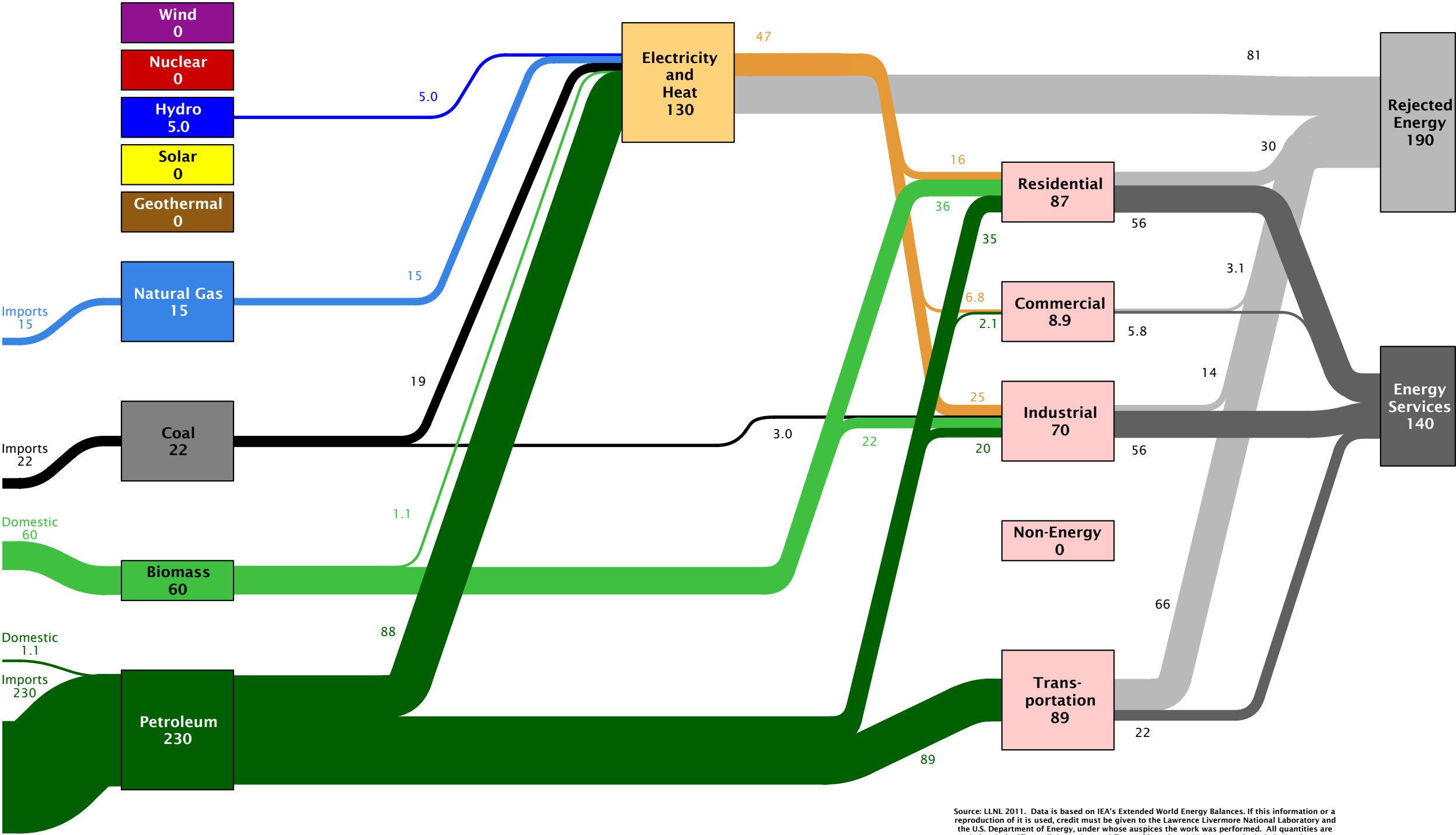
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Denmark Energy Flow  
in 2007: ~920 PJ



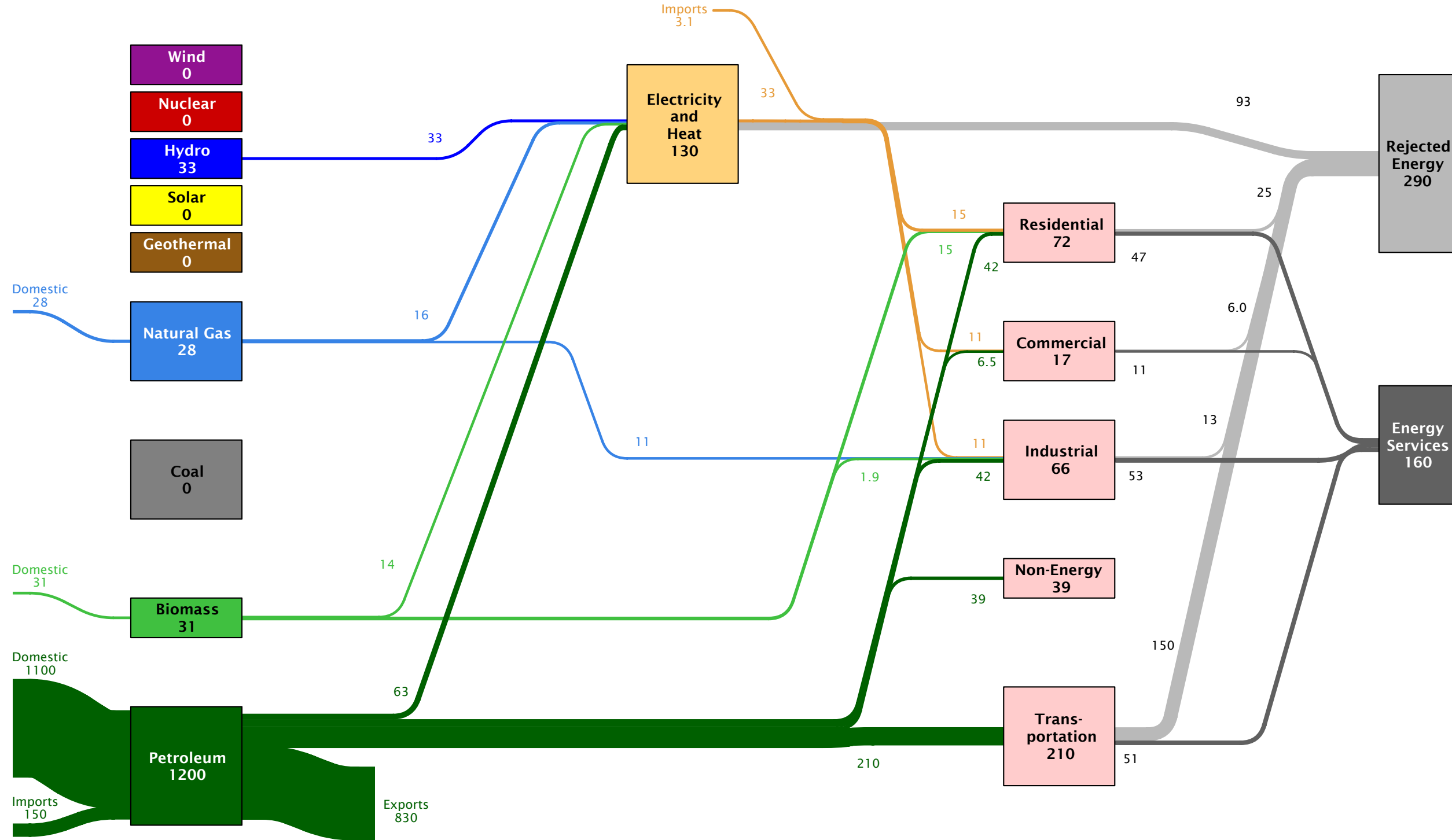
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Dominican Republic Energy Flow  
in 2007: ~330 PJ



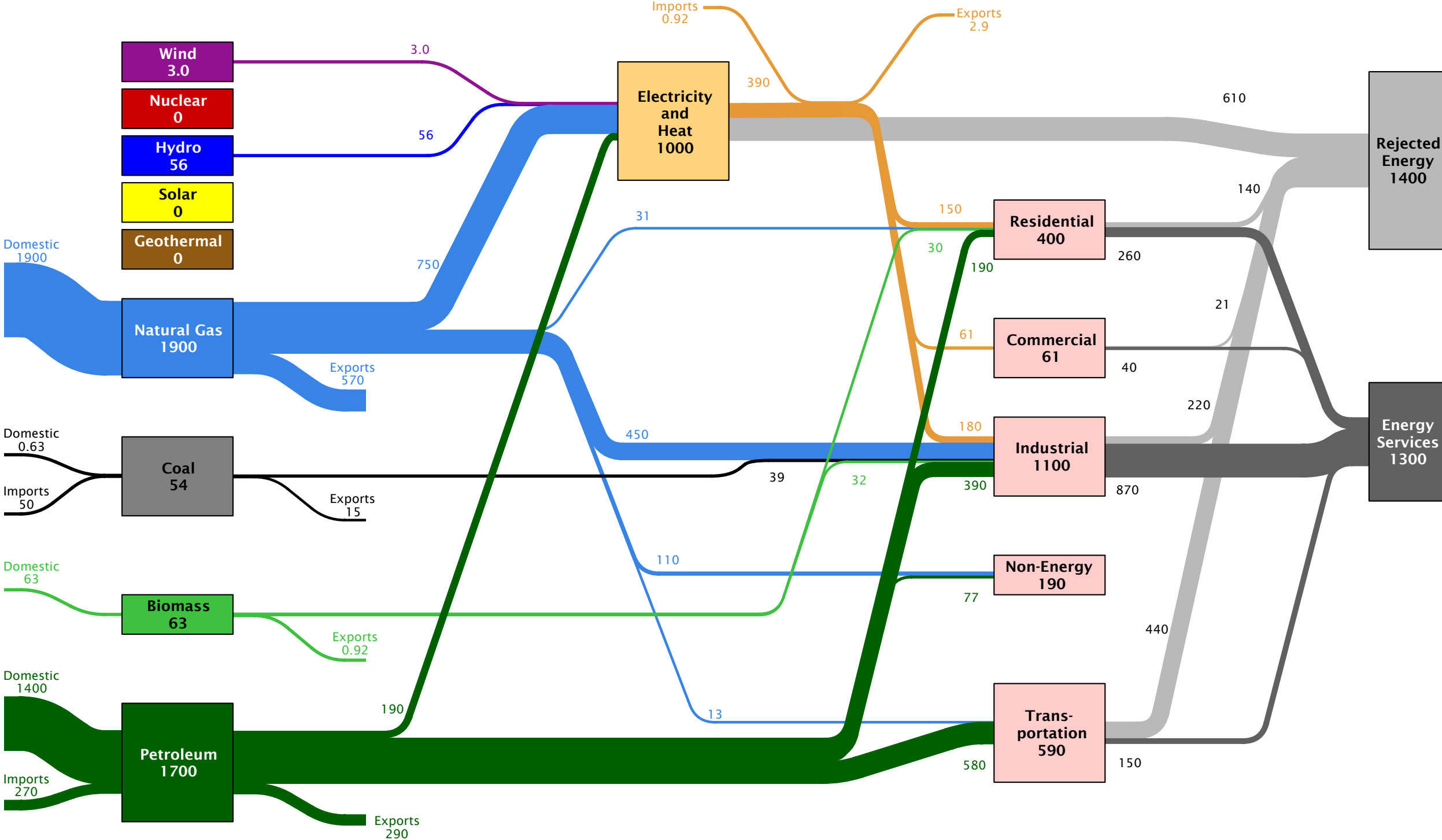
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Ecuador Energy Flow  
in 2007: ~490 PJ



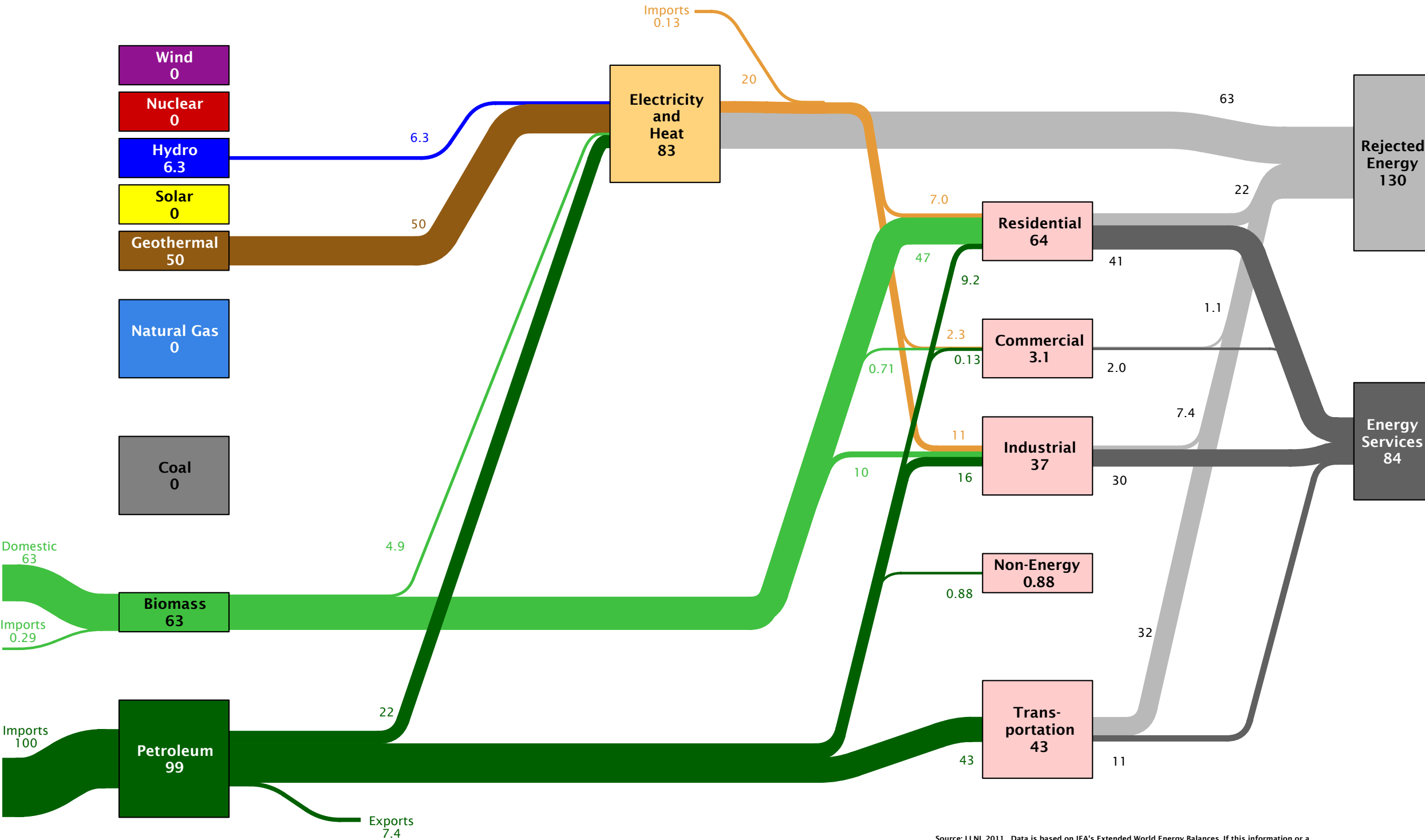
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Egypt Energy Flow  
in 2007: ~2900 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

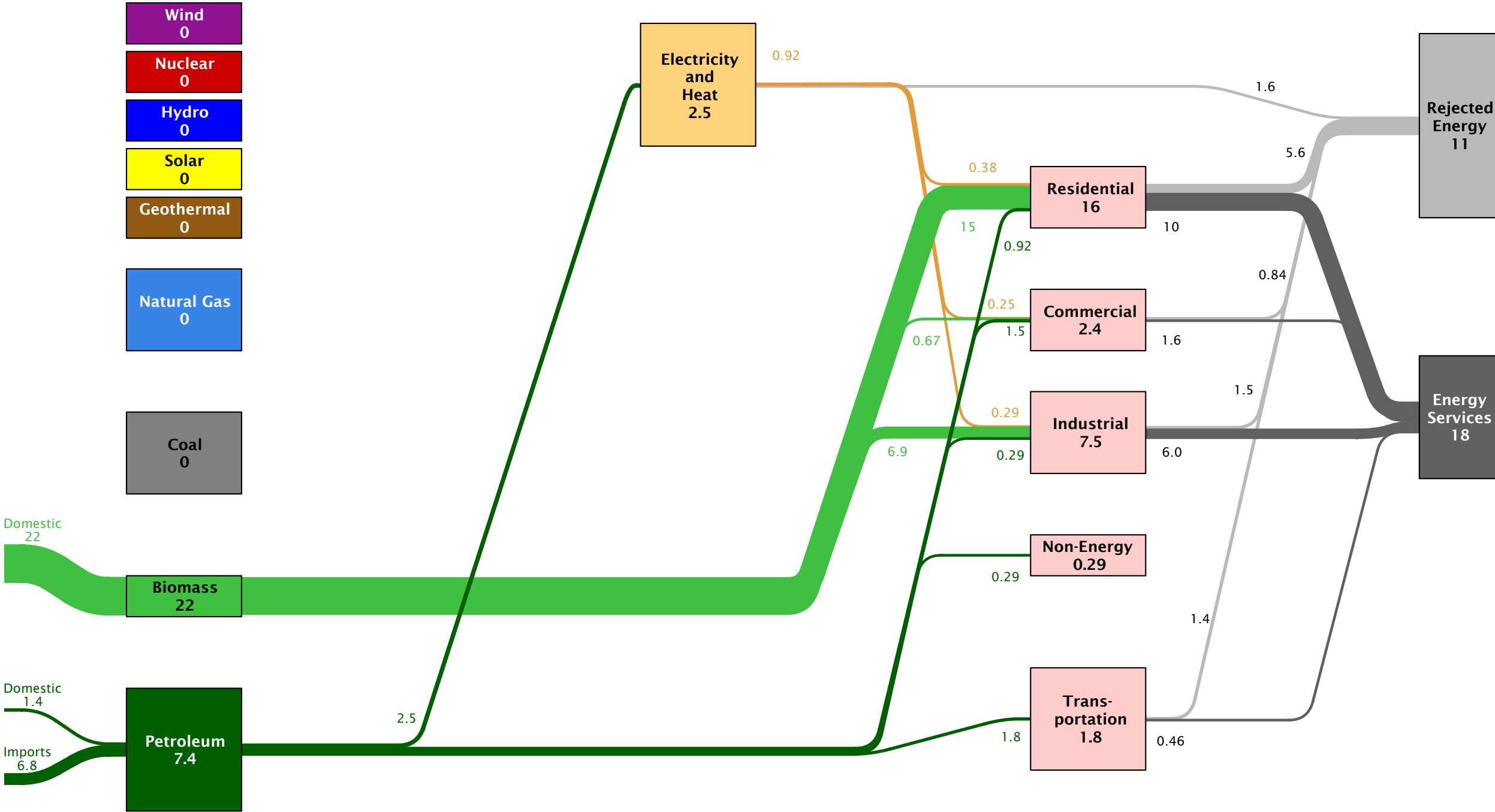
El Salvador Energy Flow  
in 2007: ~210 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

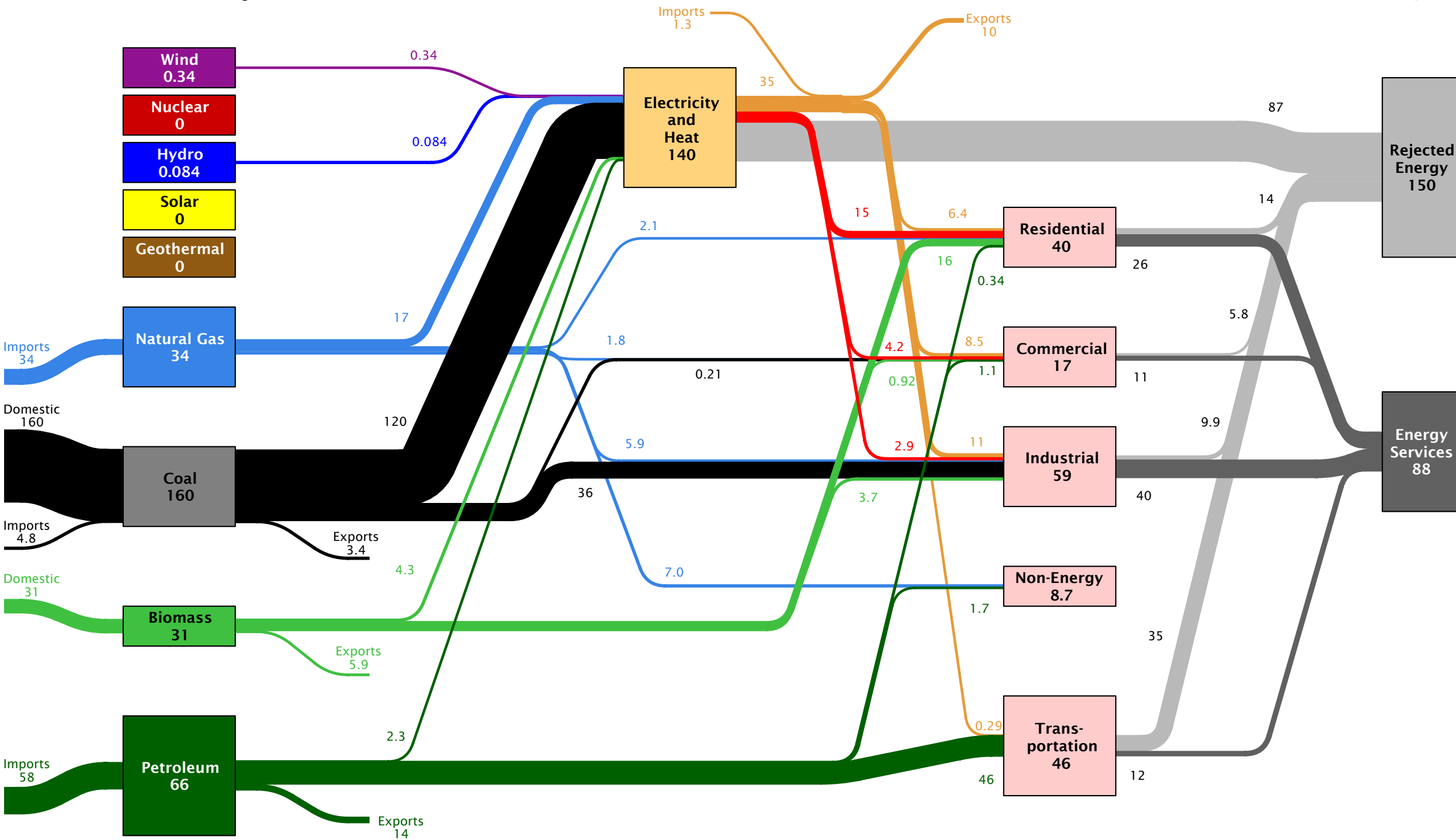


Eritrea Energy Flow  
in 2007: ~30 PJ



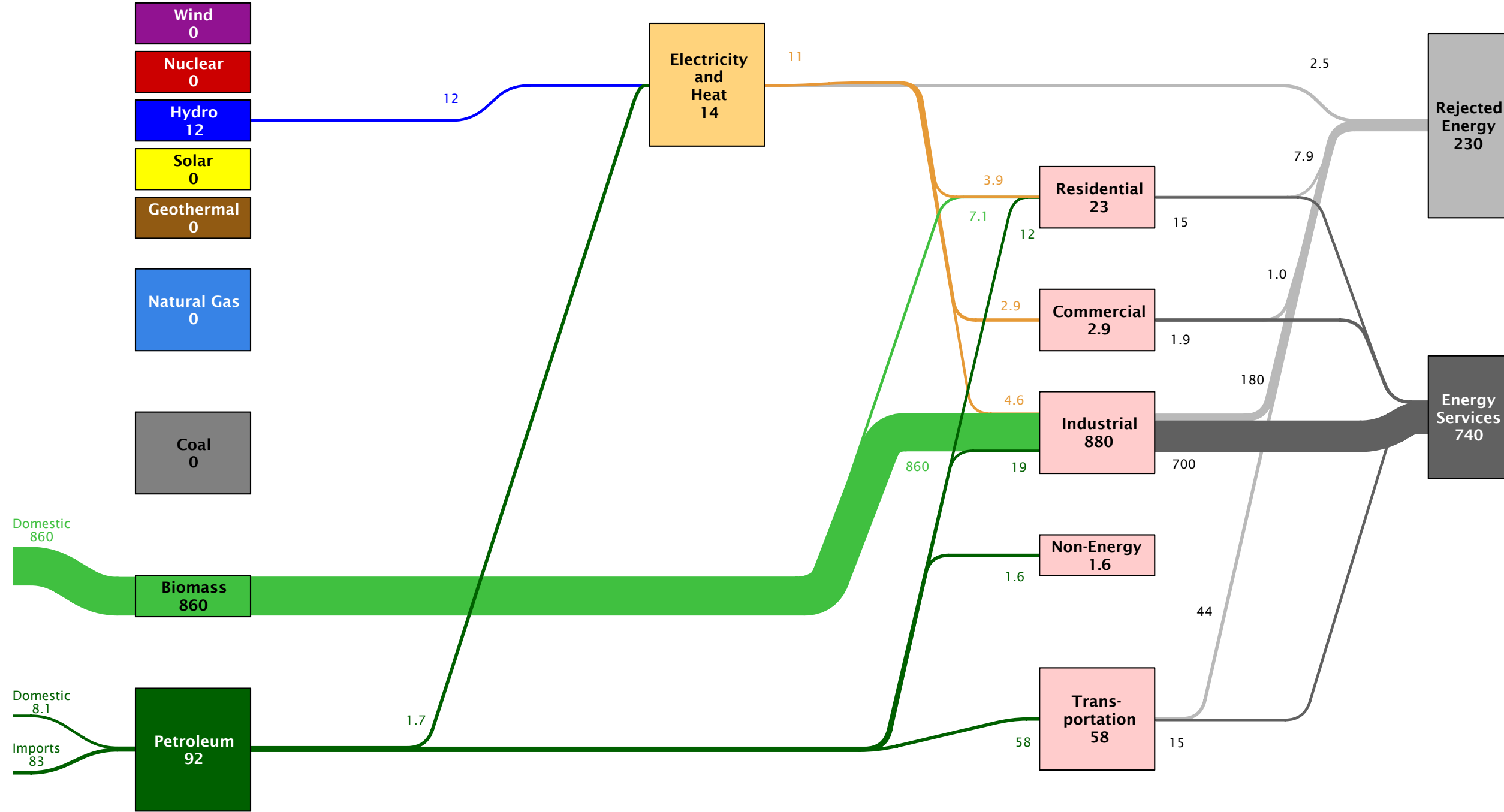
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Estonia Energy Flow  
in 2007: ~250 PJ



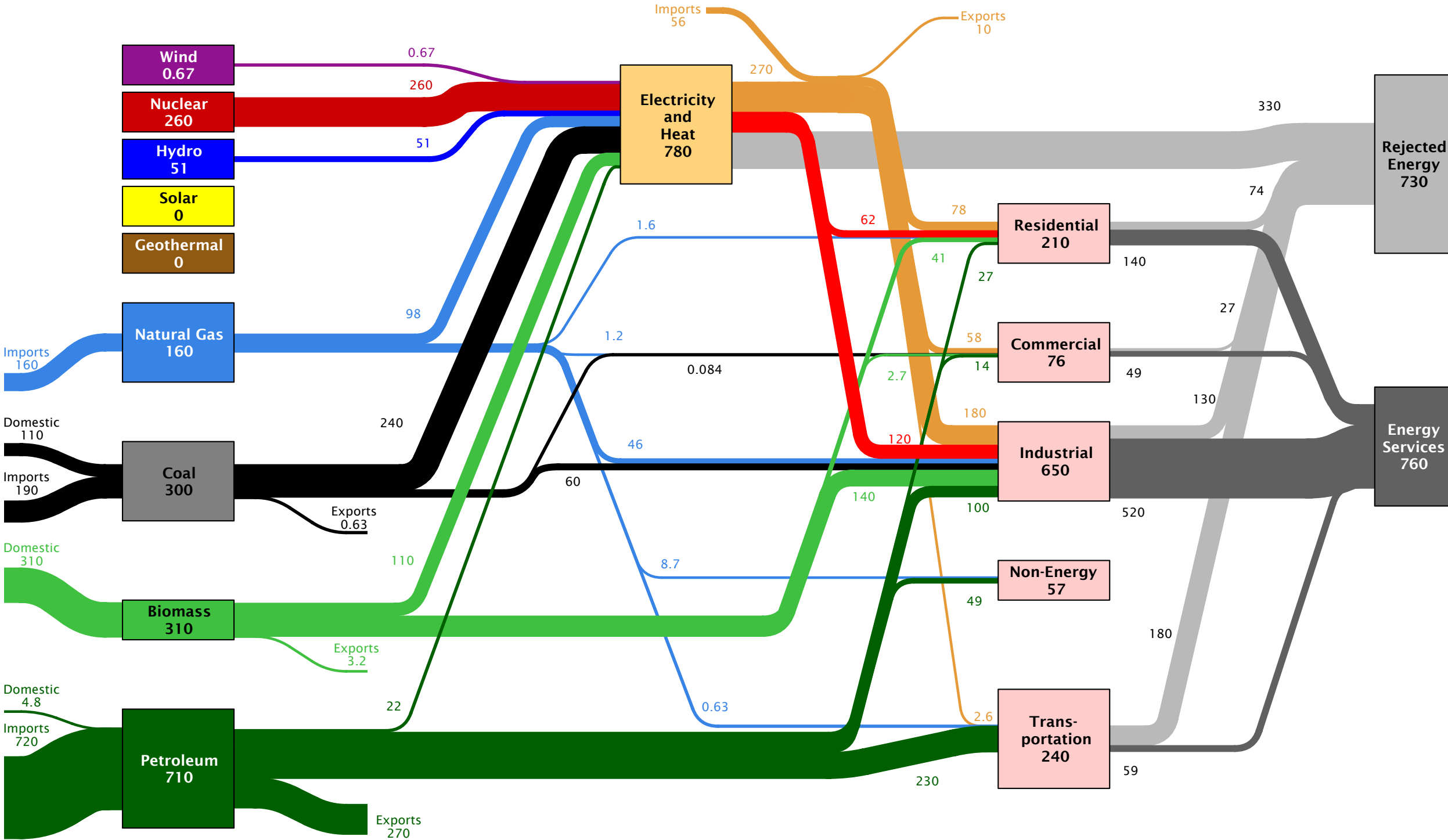
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Ethiopia Energy Flow  
in 2007: ~970 PJ



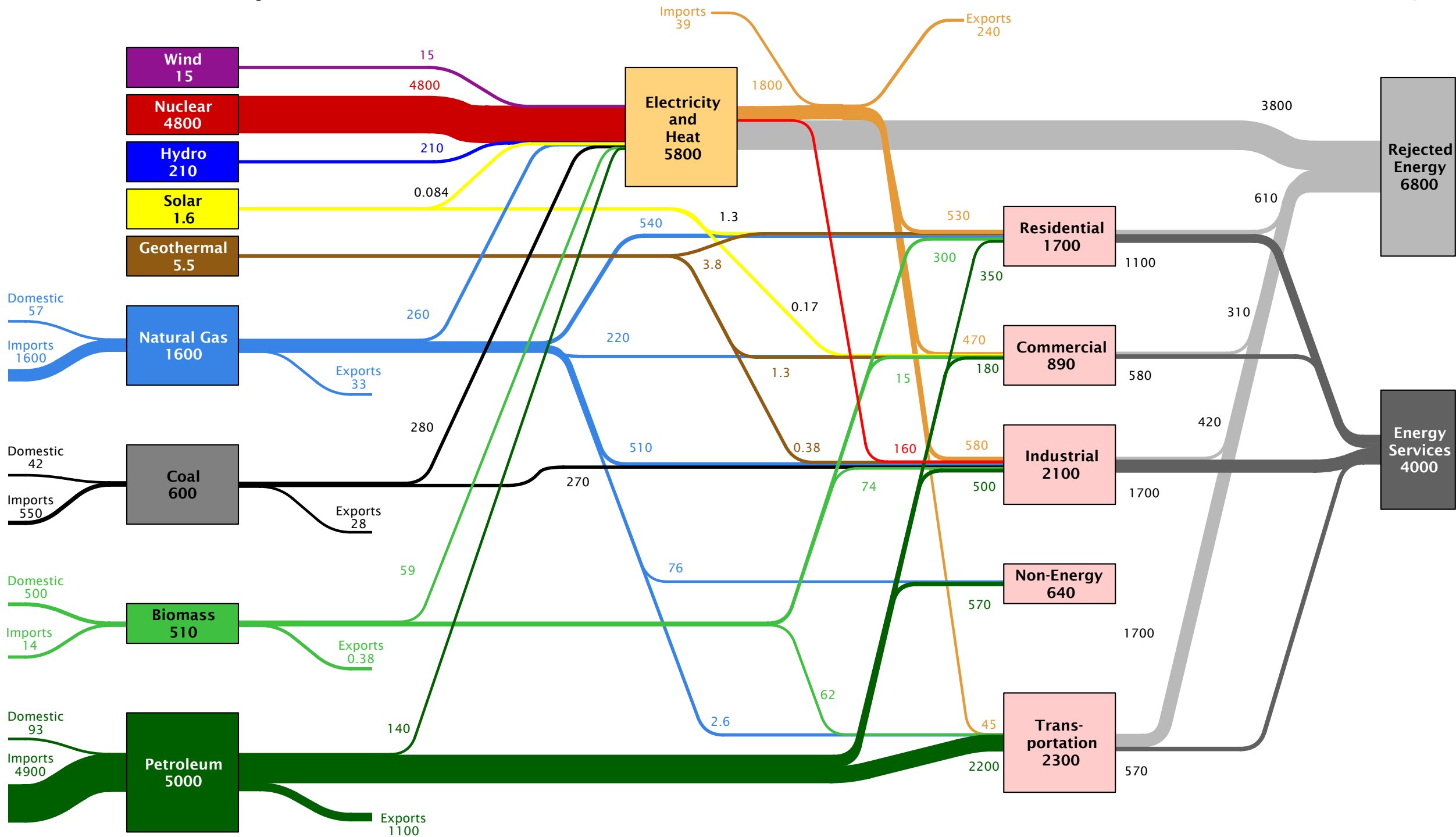
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Finland Energy Flow  
in 2007: ~1600 PJ



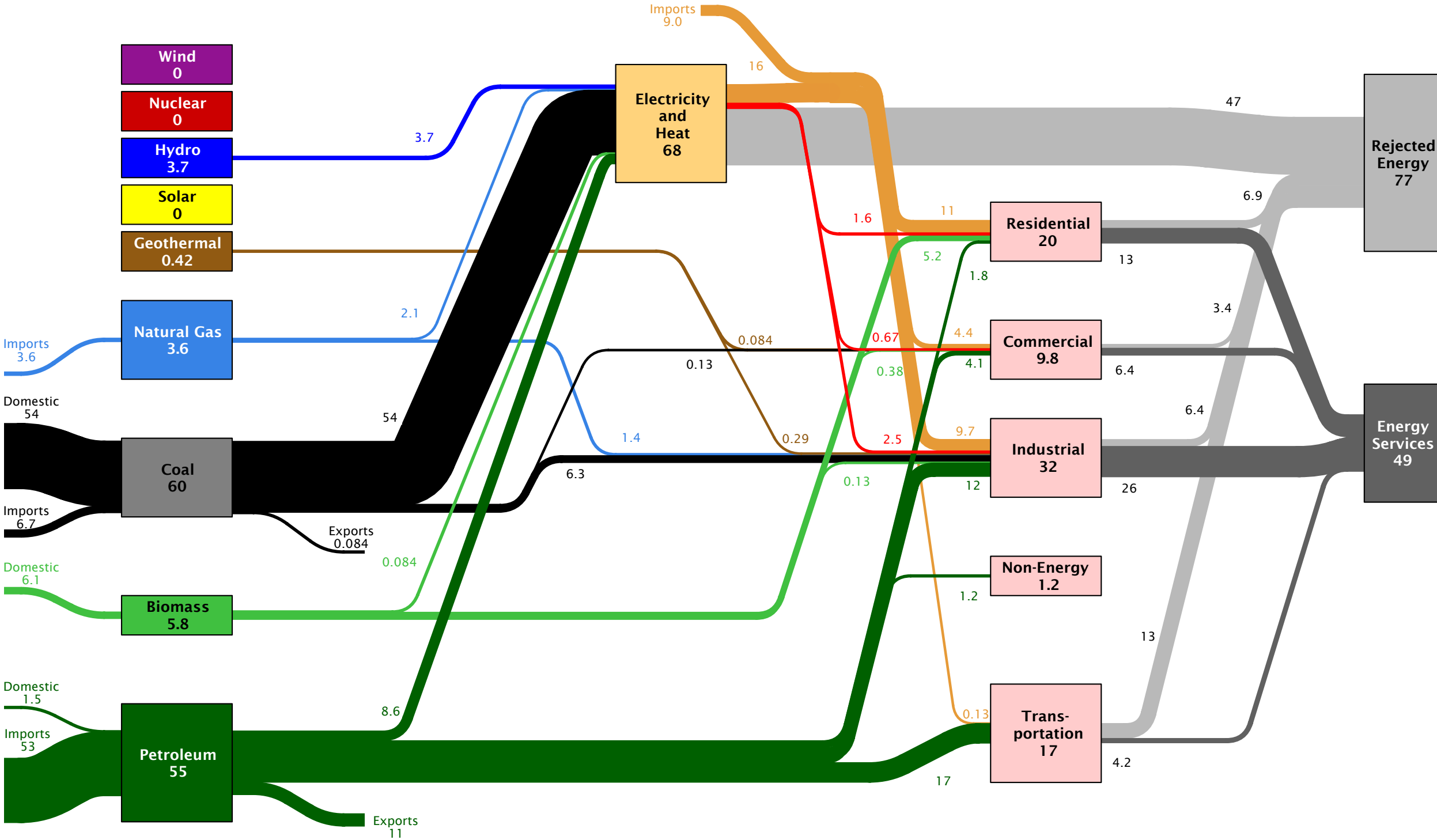
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

France Energy Flow  
in 2007: ~11000 PJ



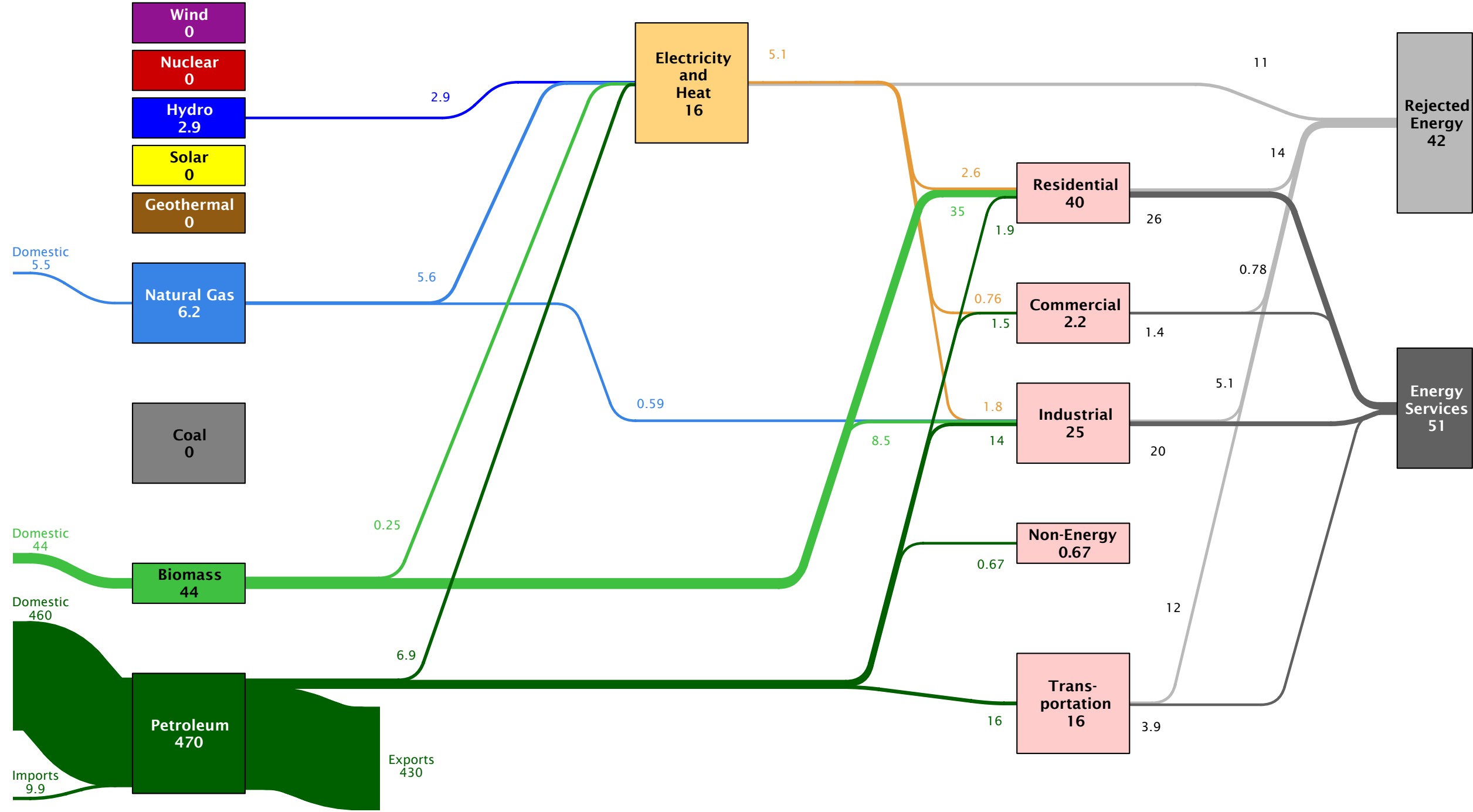
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

former Yugoslav Republic of Macedonia  
Energy Flow in 2007: ~130 PJ



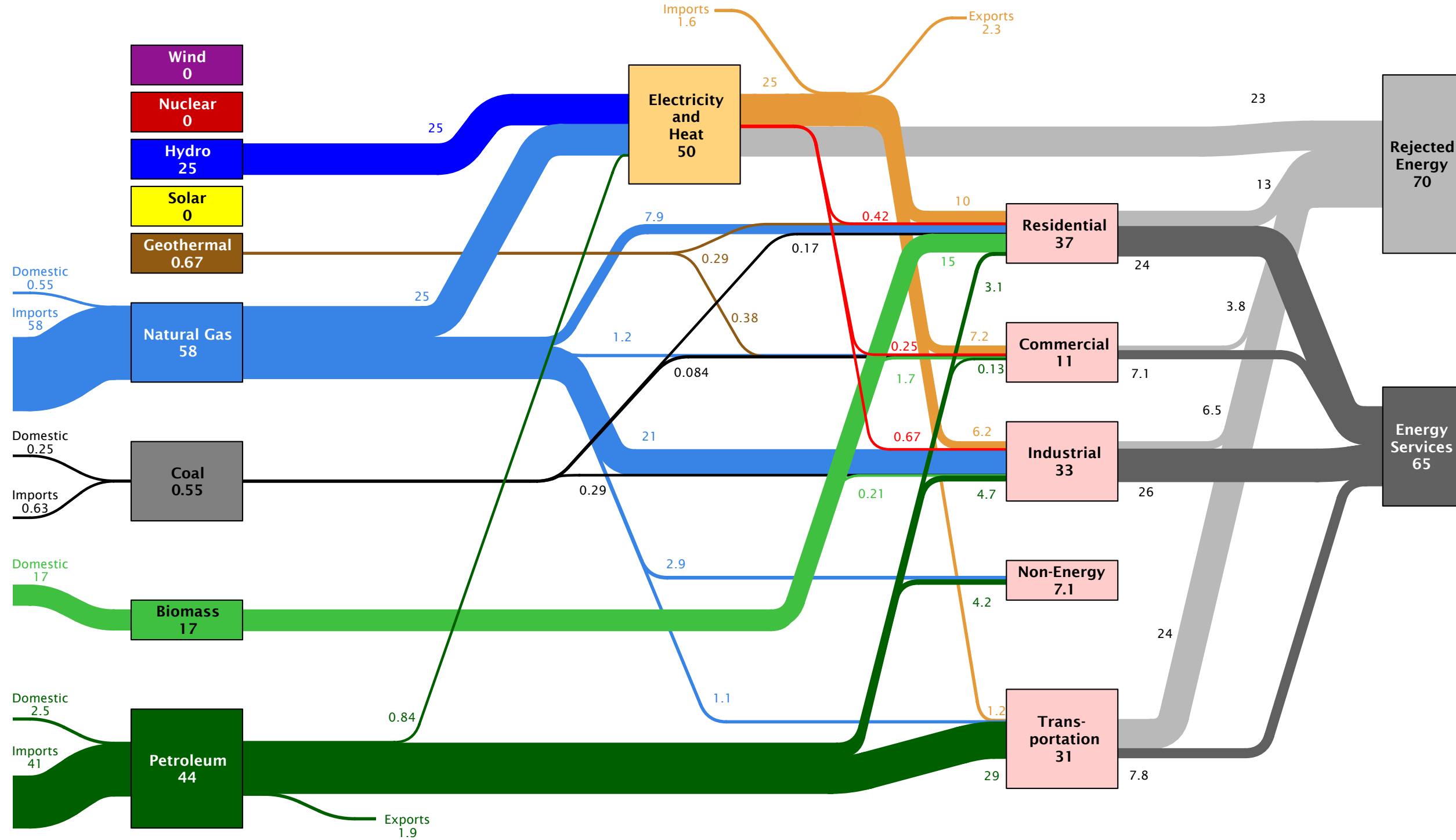
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Gabon Energy Flow  
in 2007: ~94 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

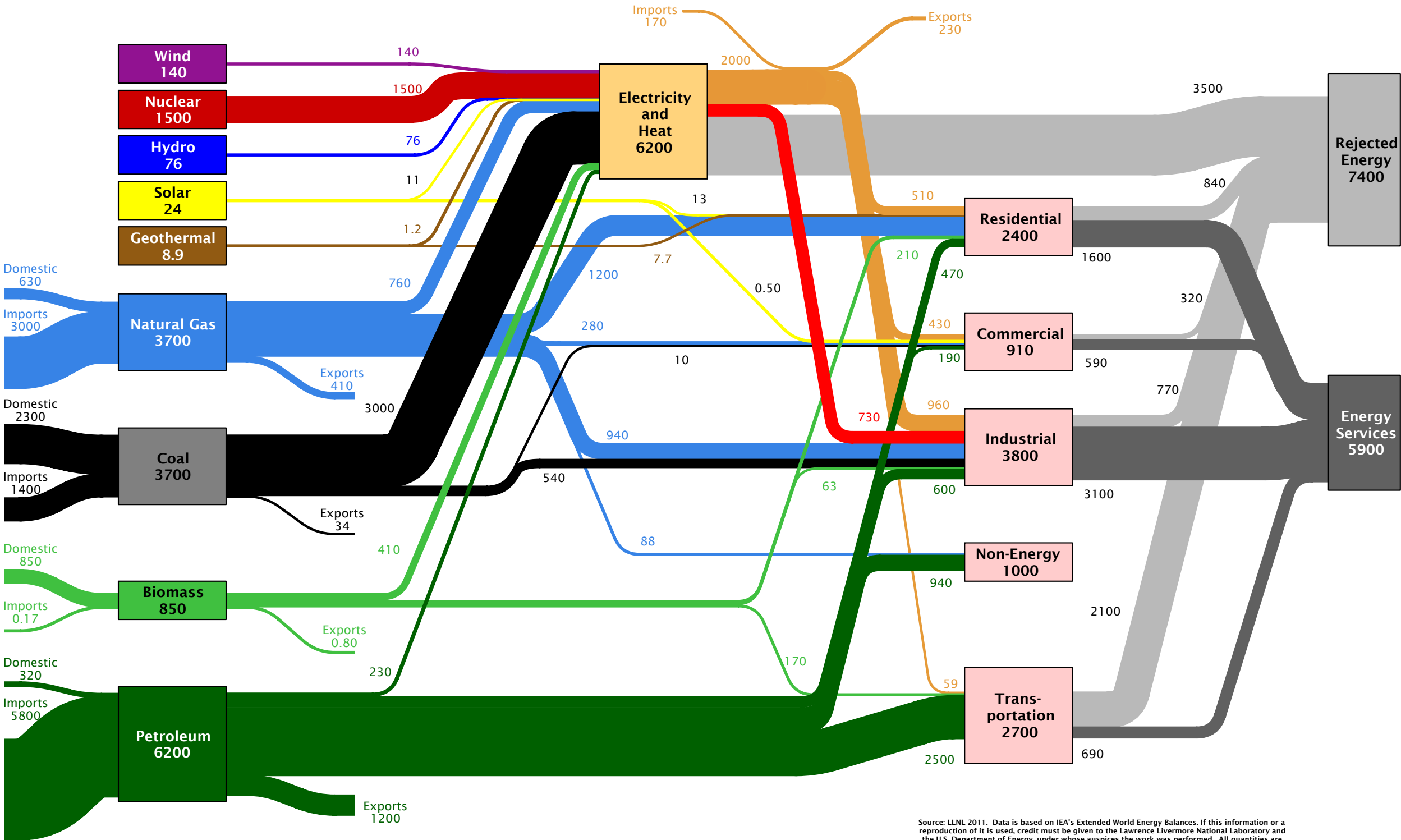
Georgia Energy Flow  
in 2007: ~140 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

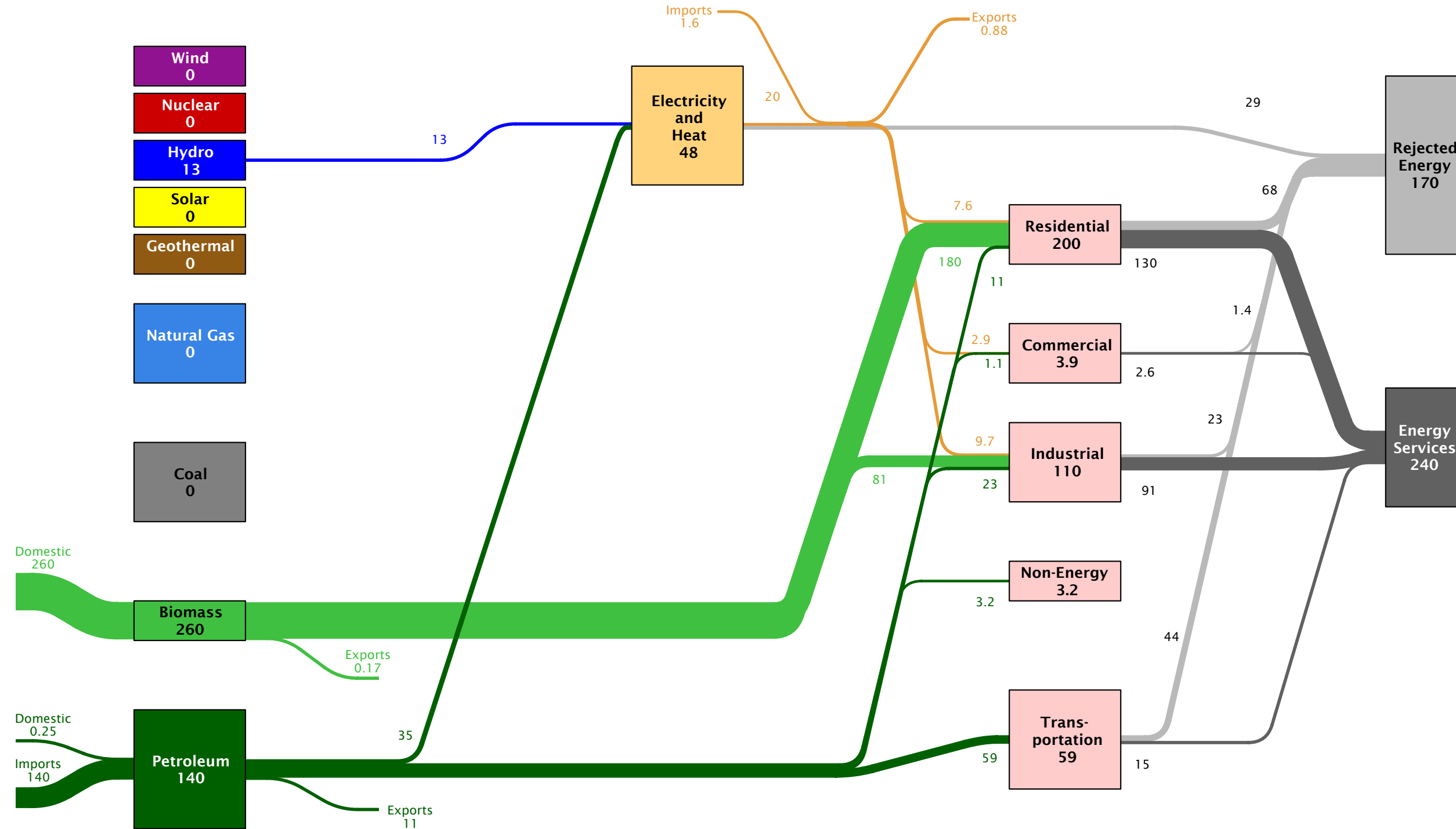


Germany Energy Flow  
in 2007: ~14000 PJ



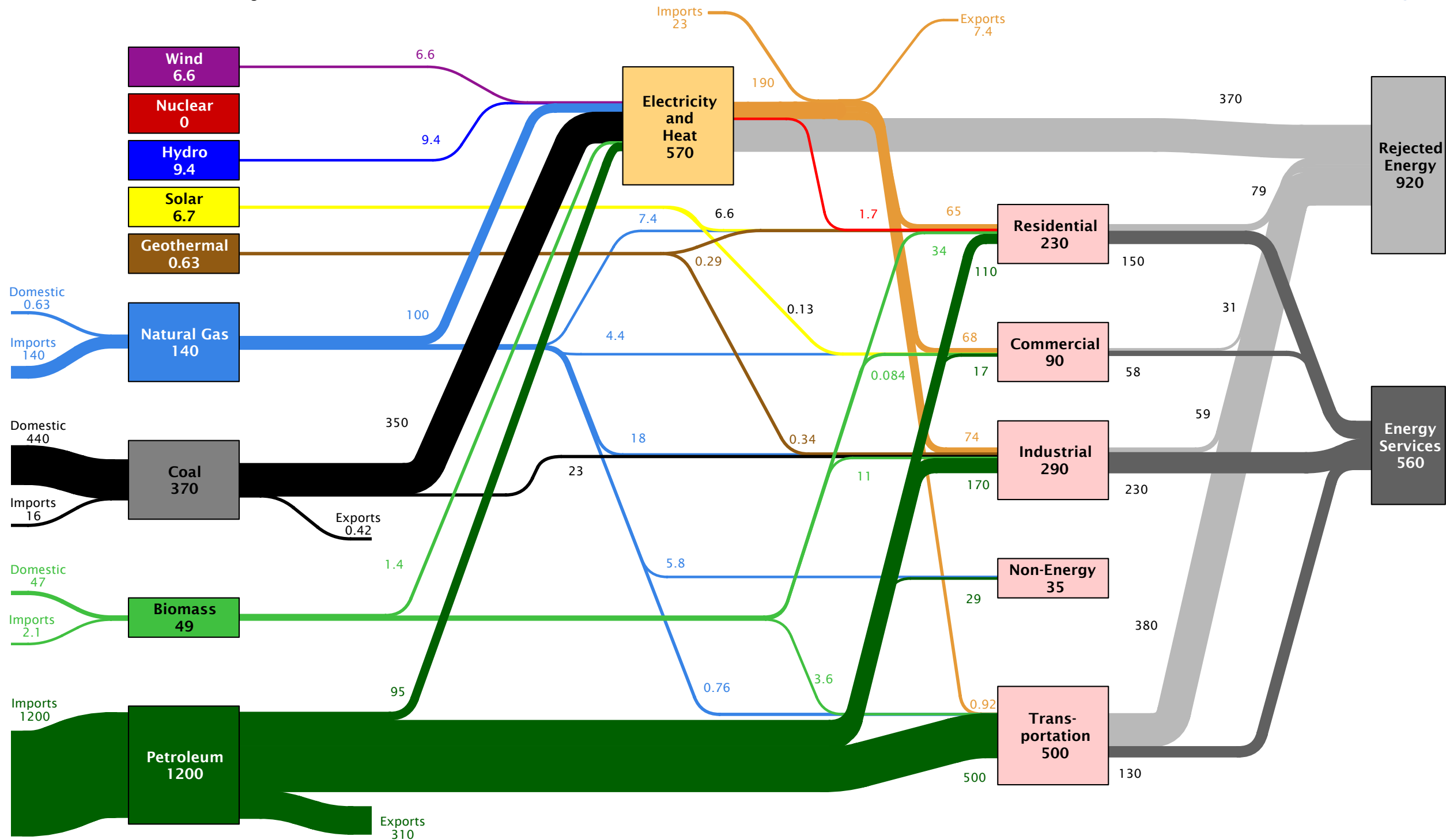
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Ghana Energy Flow  
in 2007: ~400 PJ



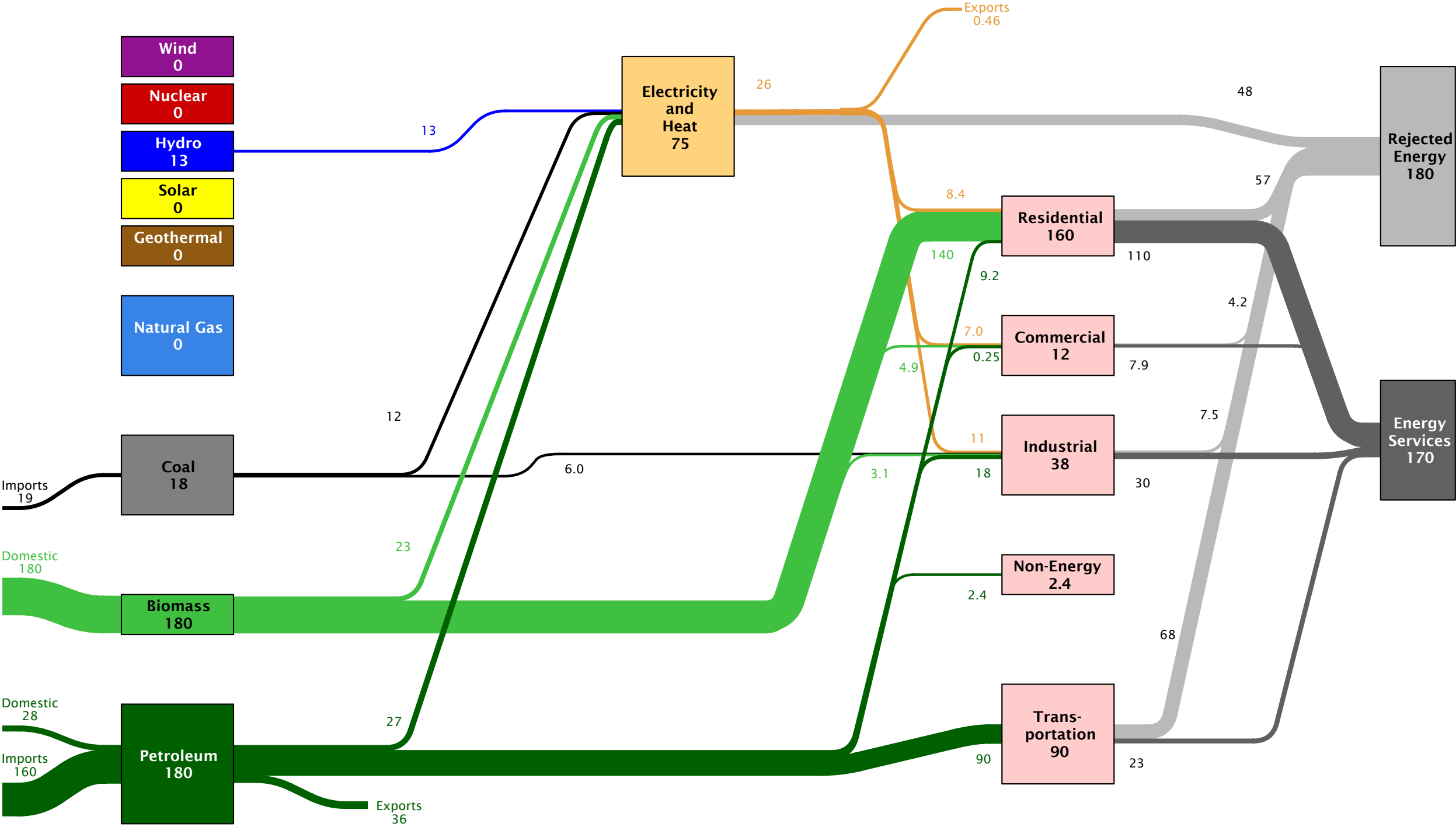
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Greece Energy Flow in 2007: ~1500 PJ



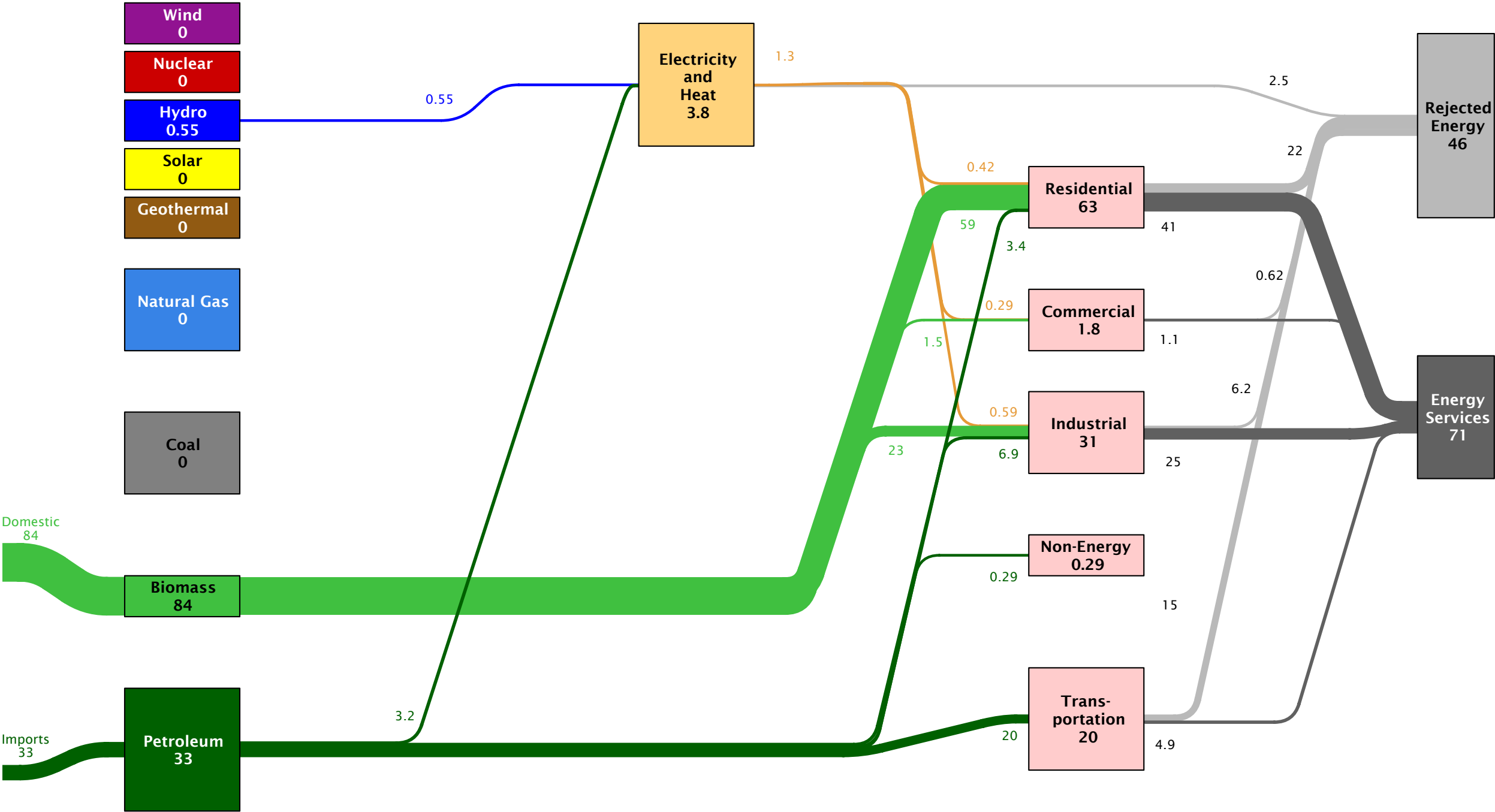
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Guatemala Energy Flow  
in 2007: ~350 PJ



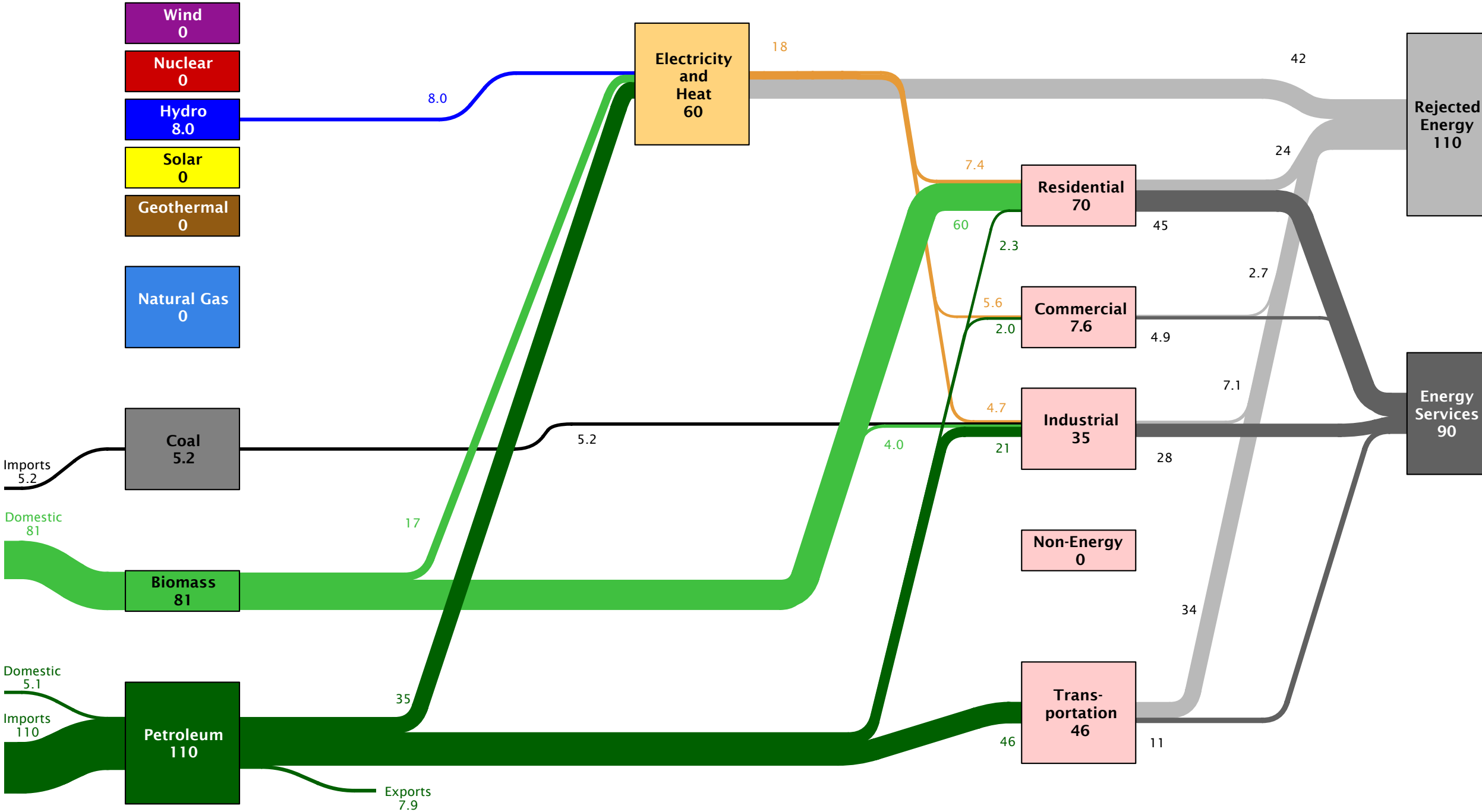
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Haiti Energy Flow  
in 2007: ~120 PJ



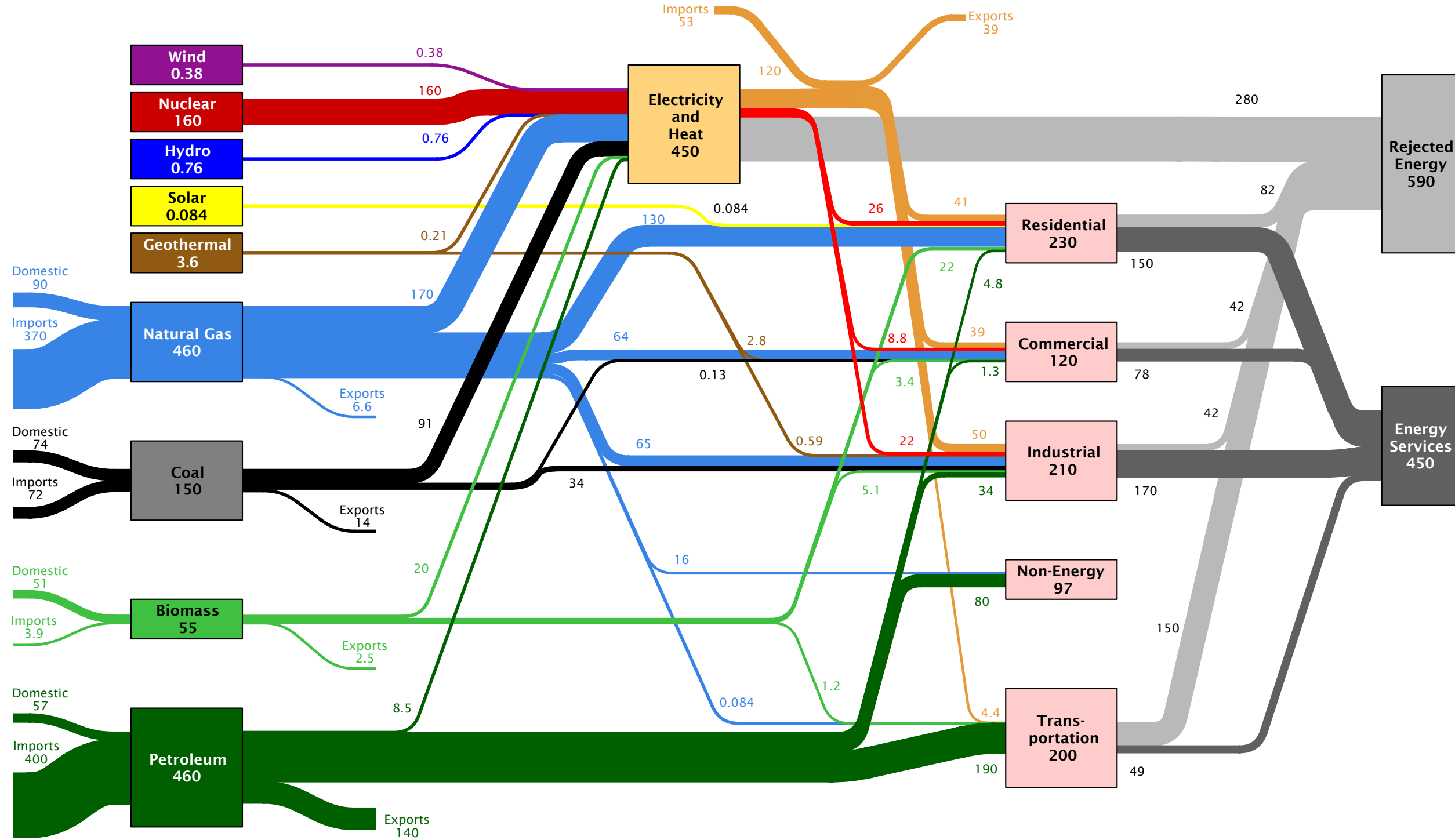
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Honduras Energy Flow  
in 2007: ~200 PJ



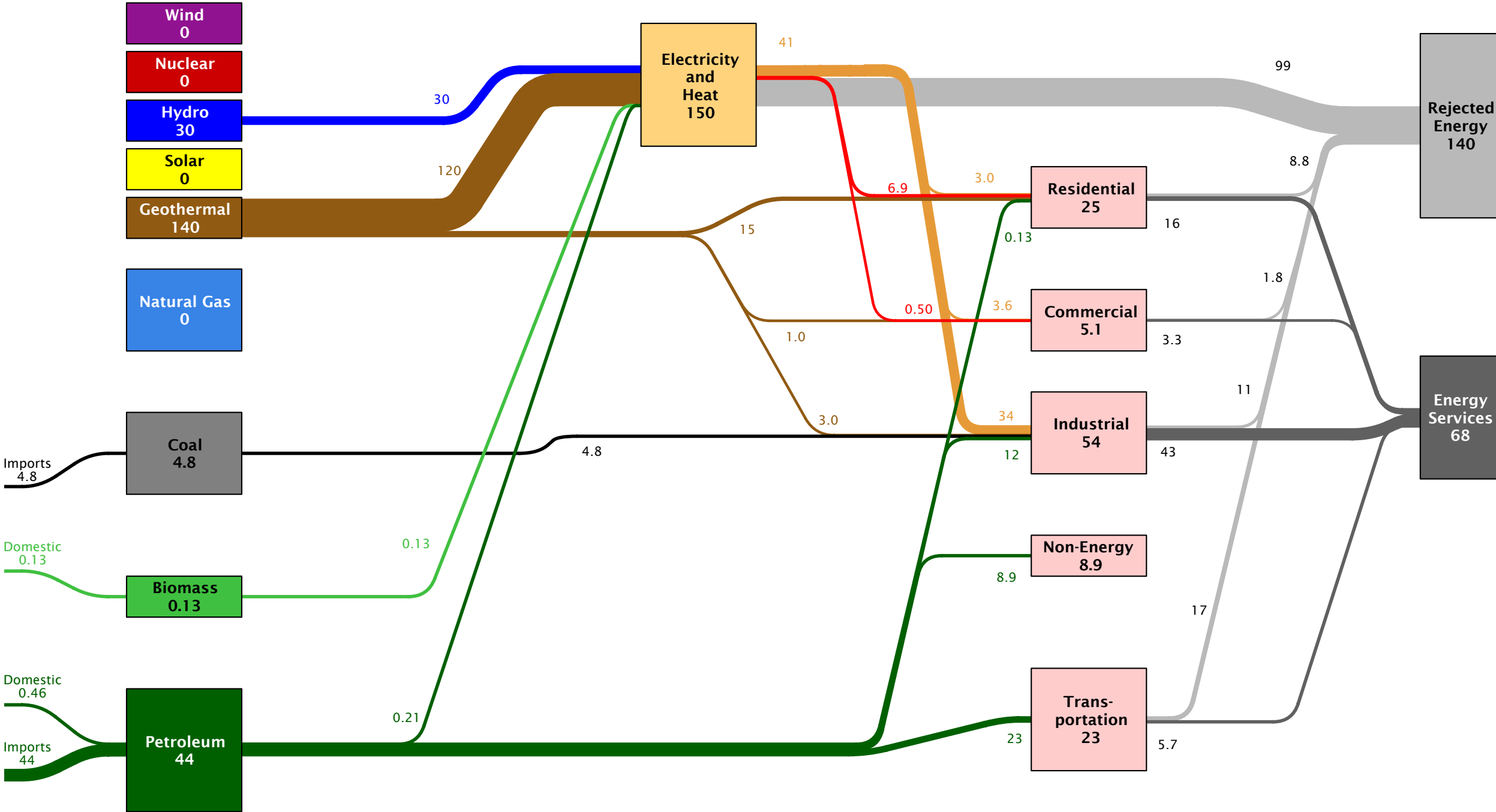
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Hungary Energy Flow  
in 2007: ~1100 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

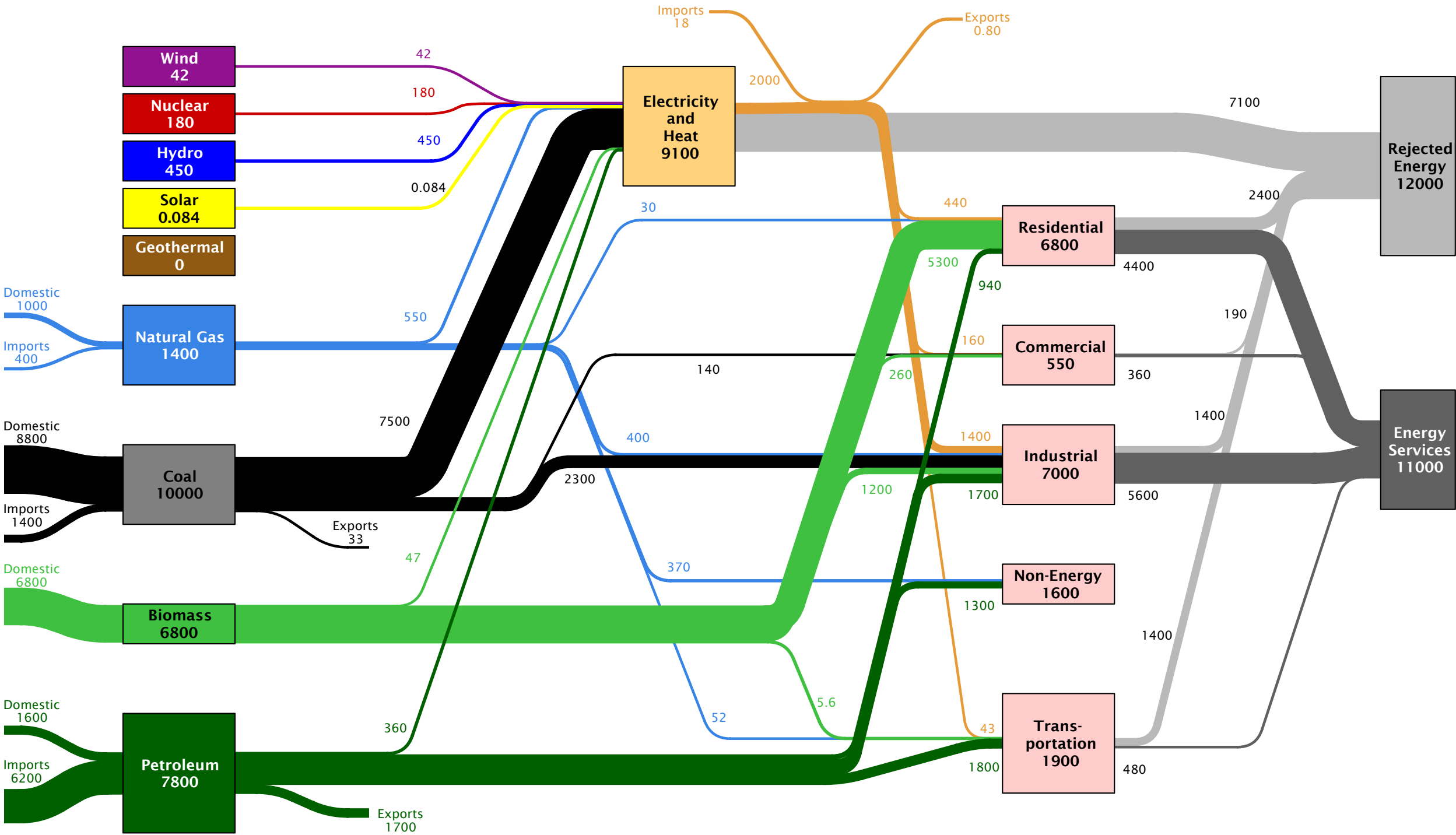
Iceland Energy Flow  
in 2007: ~220 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

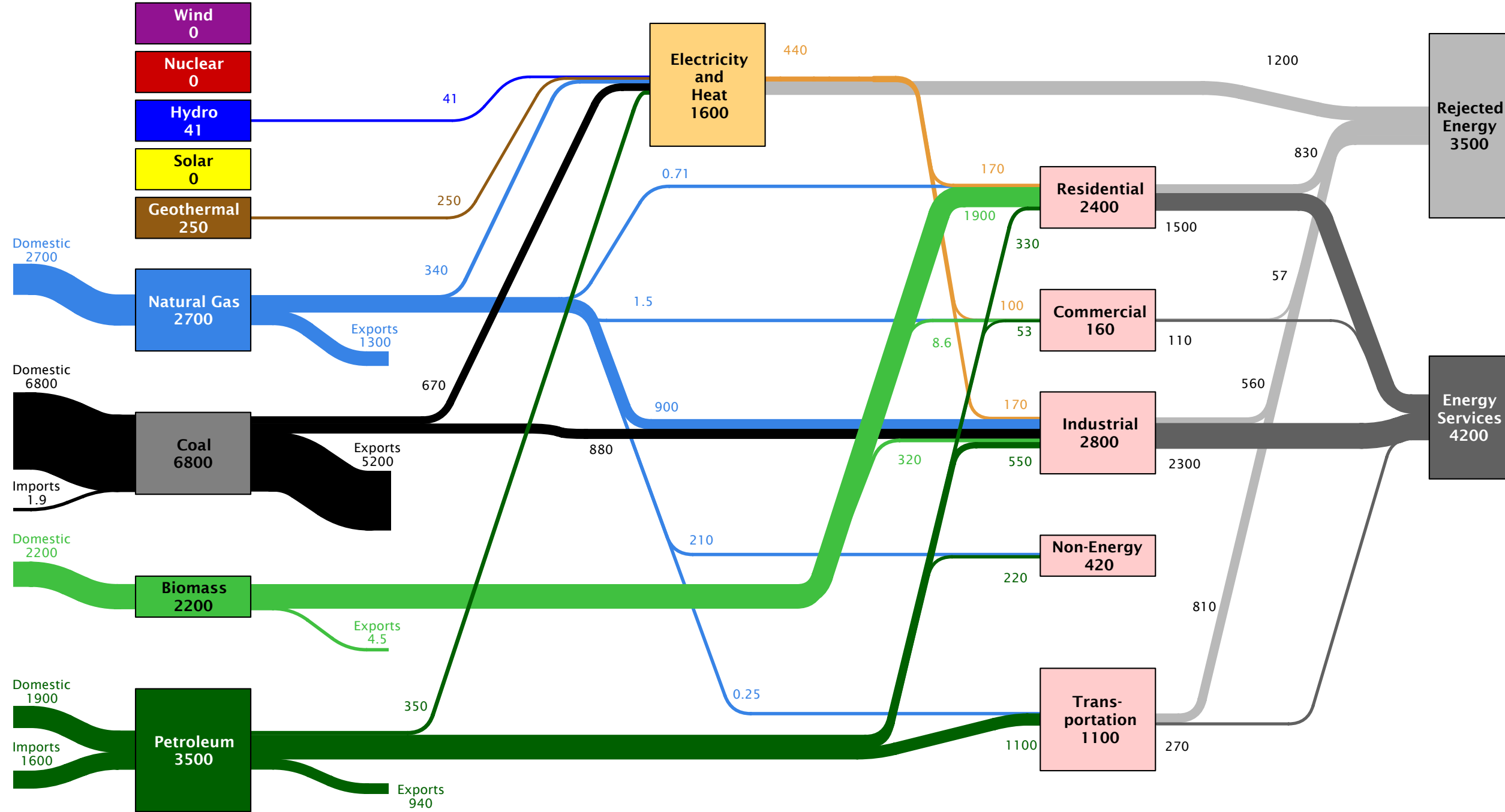


India Energy Flow  
in 2007: ~25000 PJ



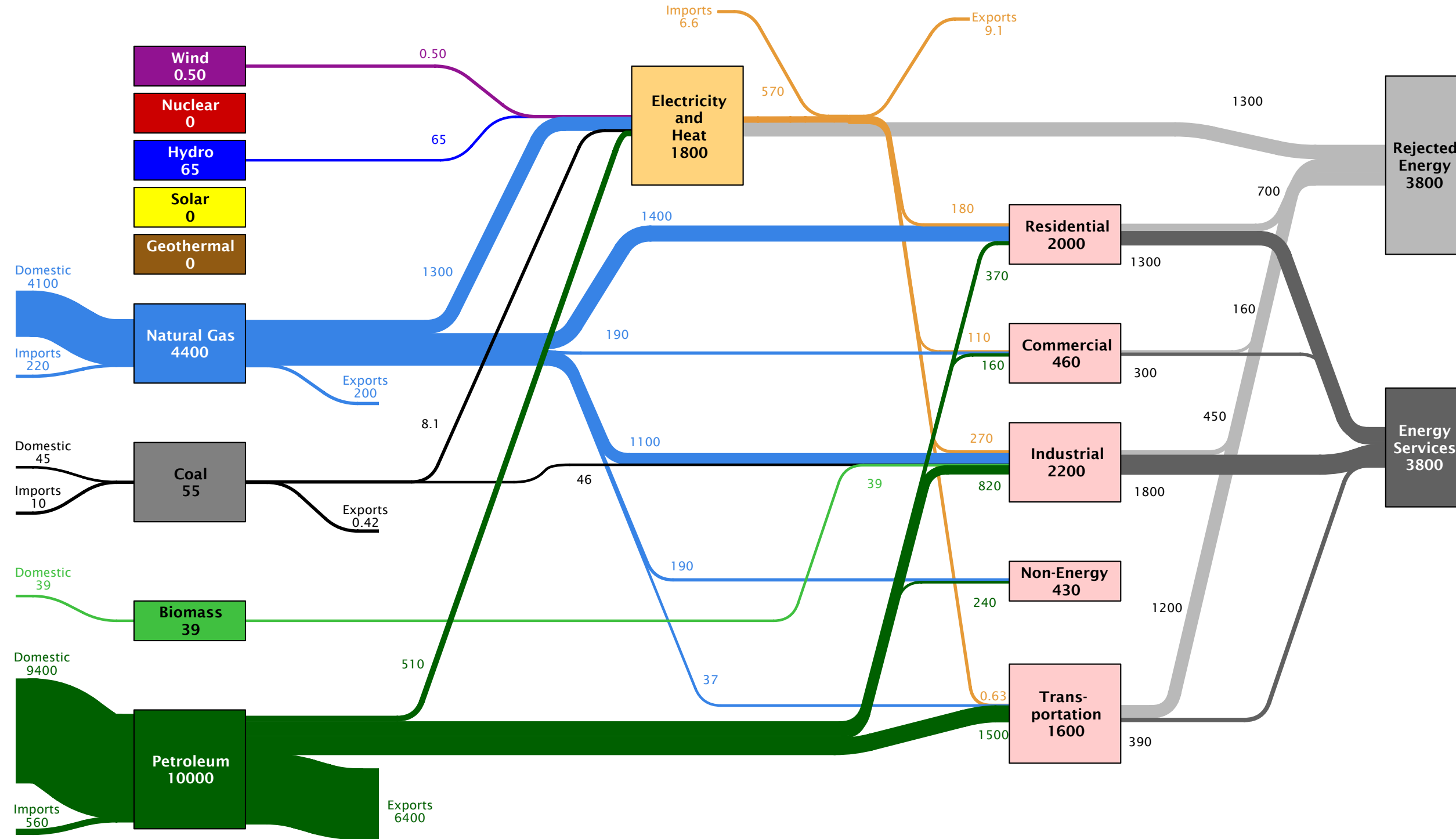
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Indonesia Energy Flow  
in 2007: ~8100 PJ



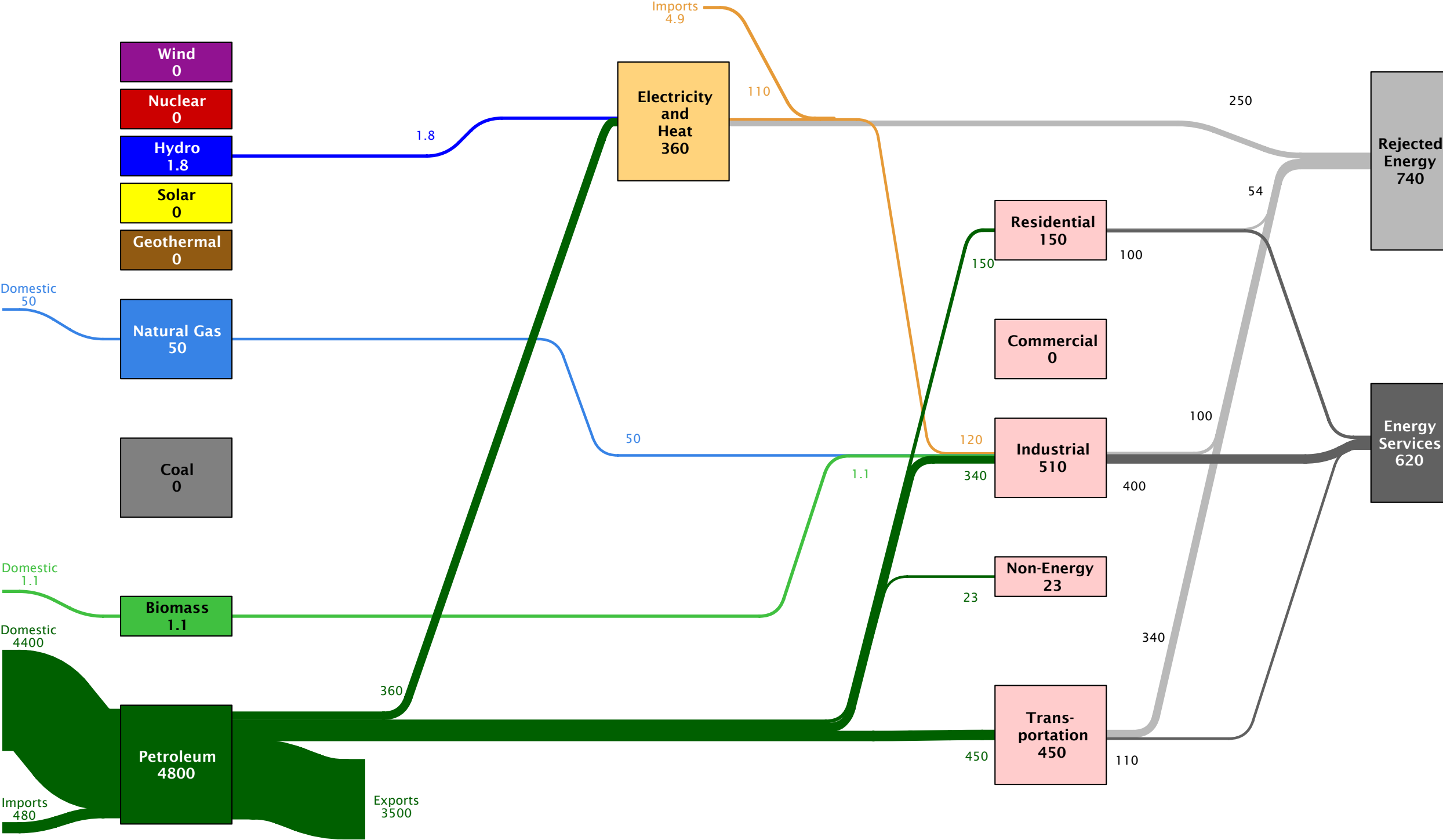
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Iran Energy Flow  
in 2007: ~8000 PJ



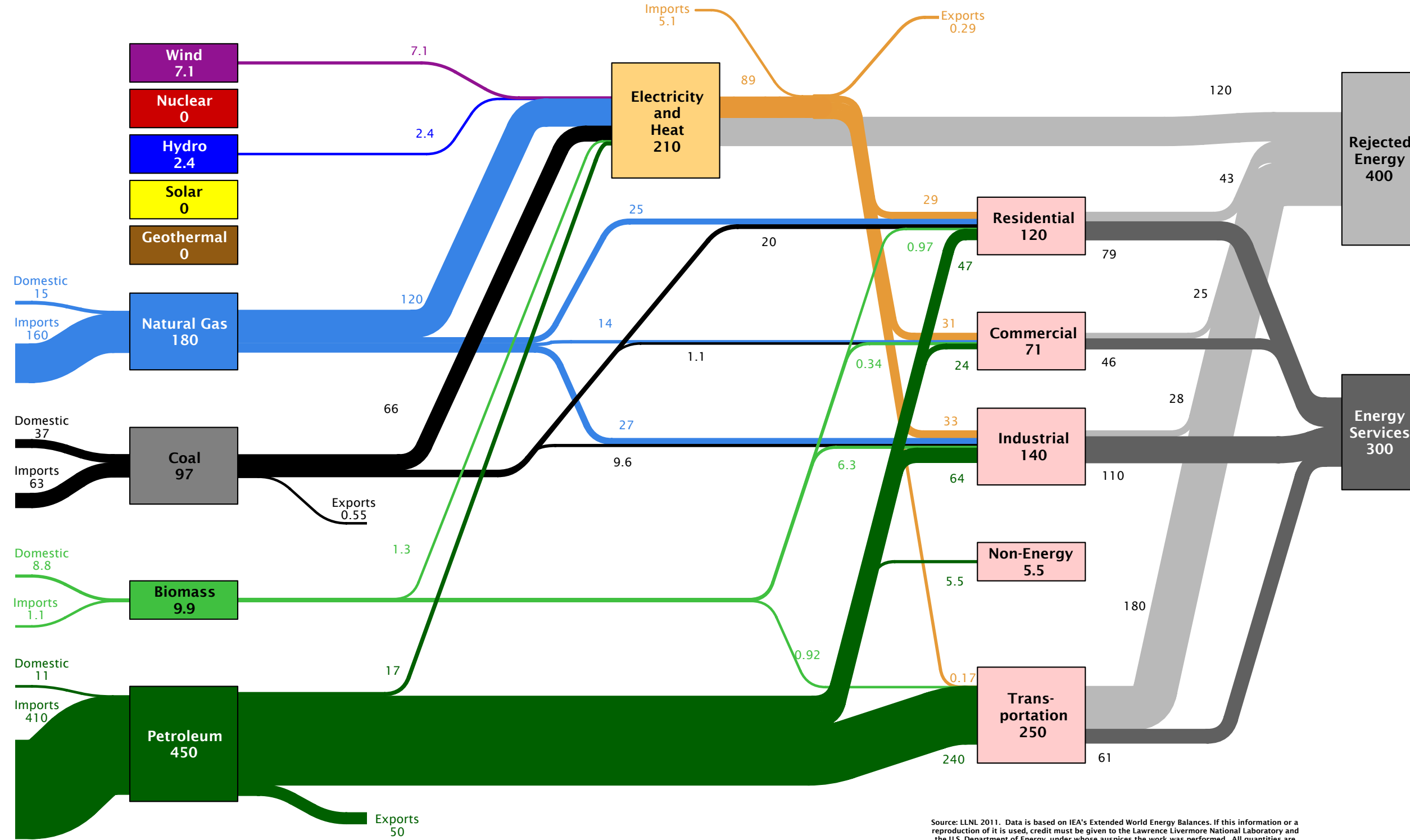
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Iraq Energy Flow  
in 2007: ~1400 PJ



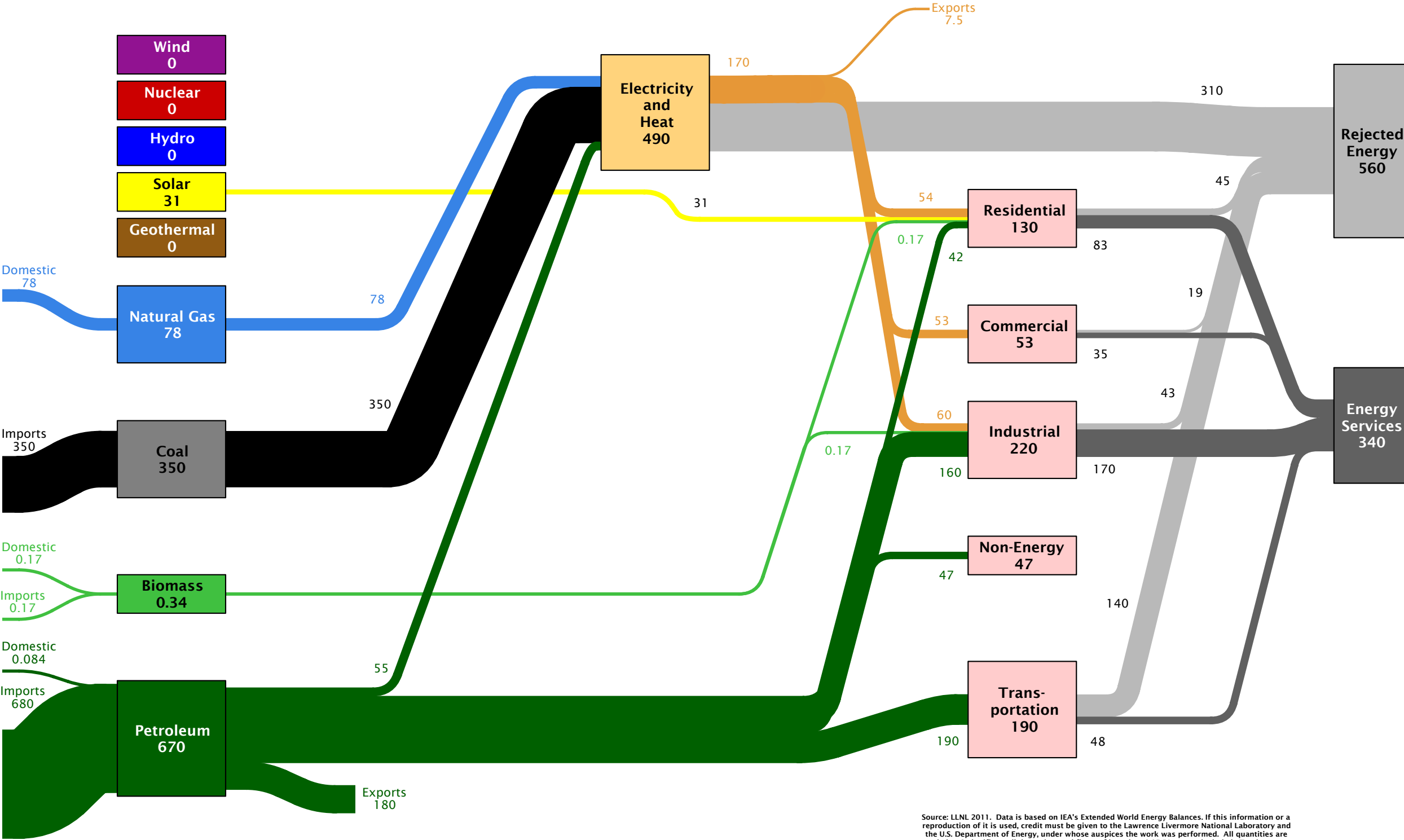
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Ireland Energy Flow  
in 2007: ~710 PJ



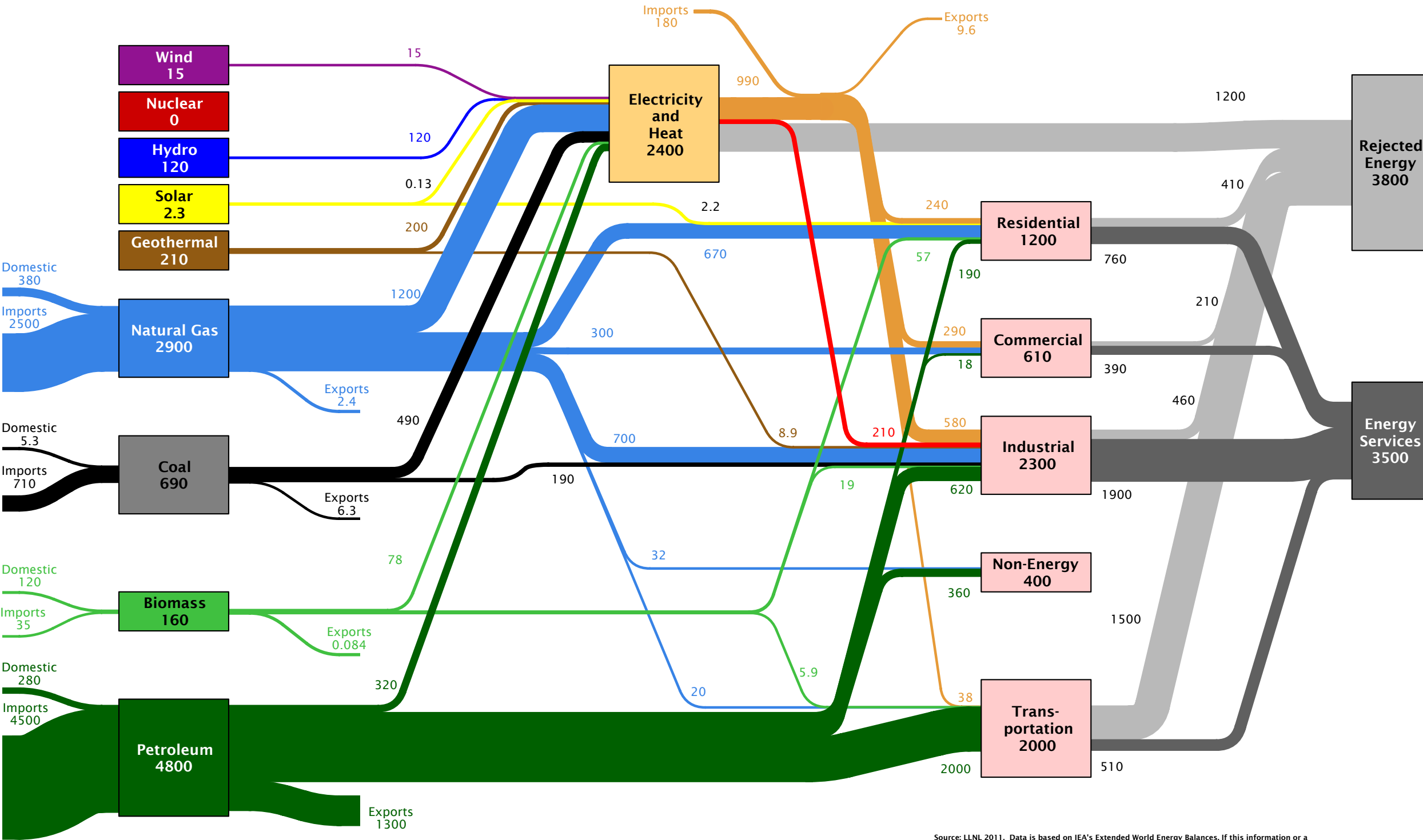
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Israel Energy Flow  
in 2007: ~950 PJ



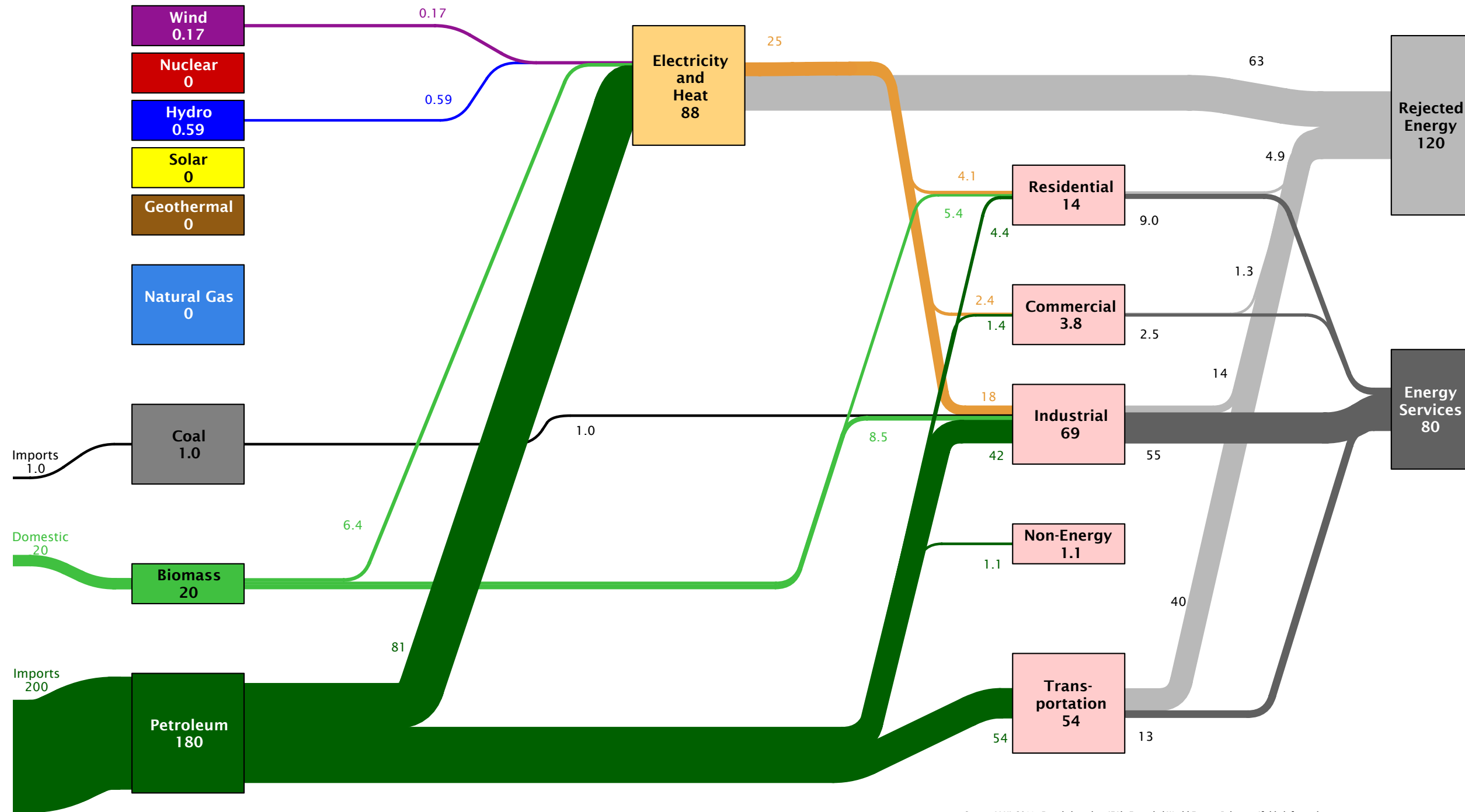
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Italy Energy Flow  
in 2007: ~7700 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

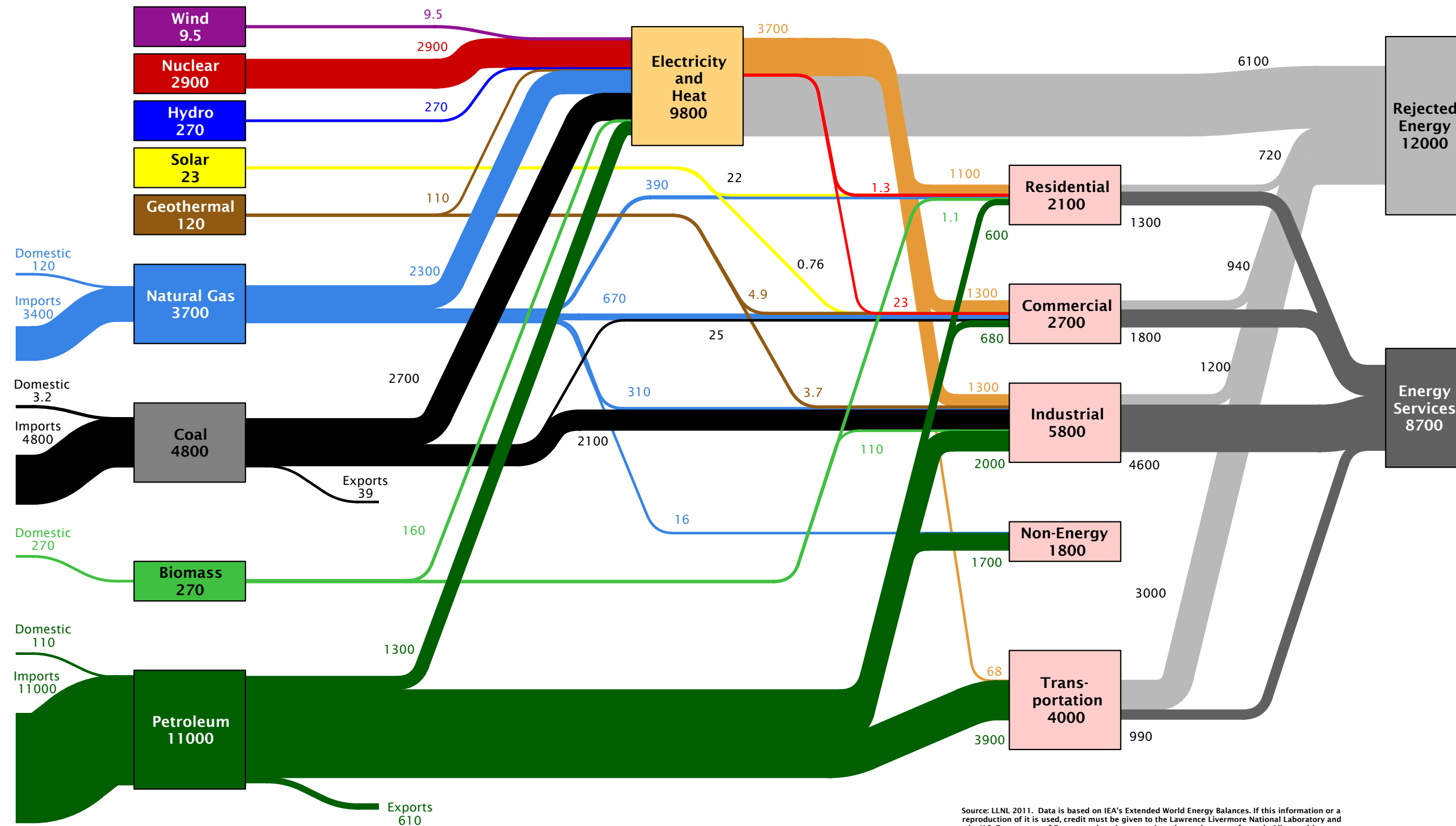
Jamaica Energy Flow  
in 2007: ~200 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

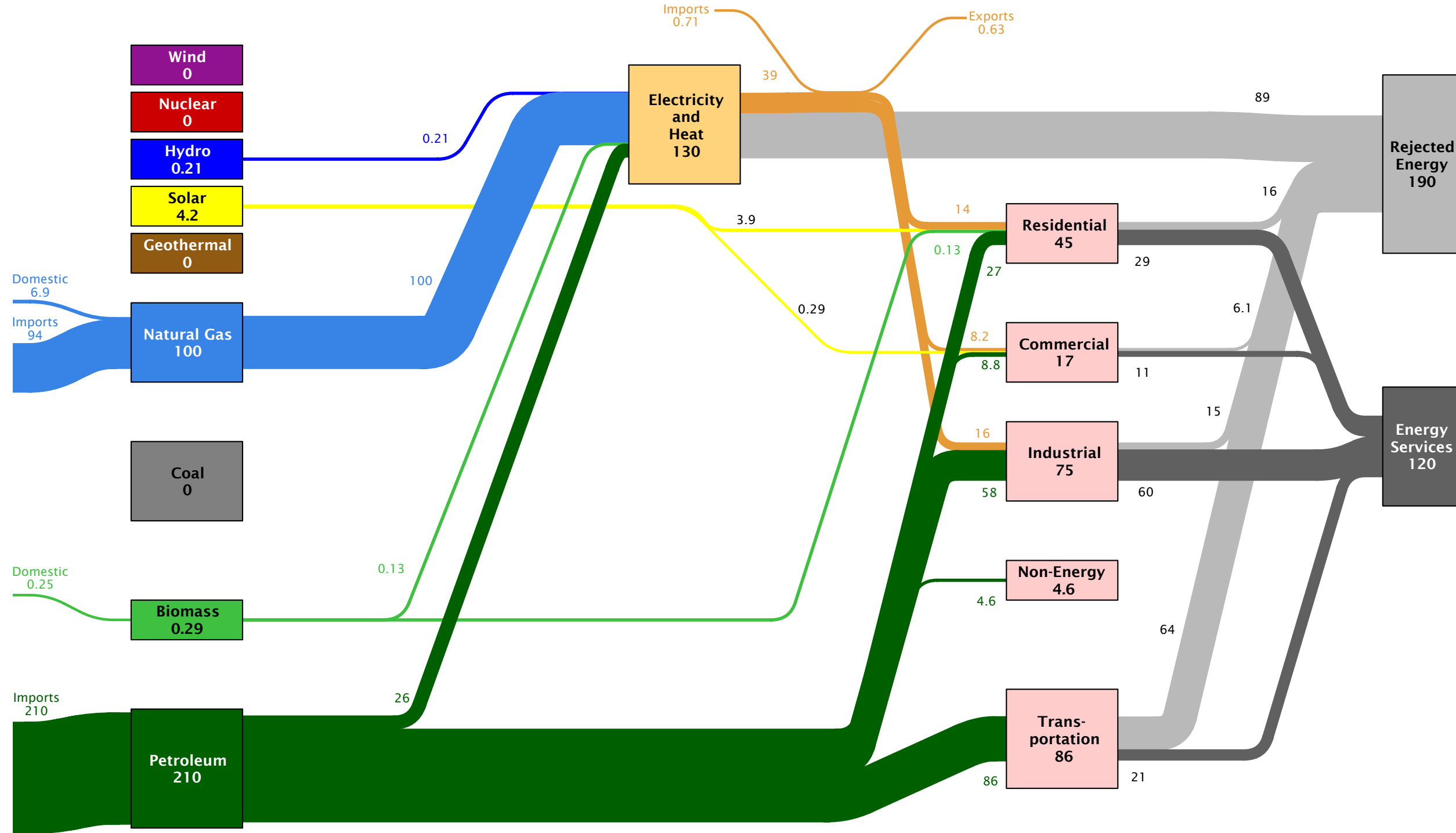


Japan Energy Flow  
in 2007: ~22000 PJ



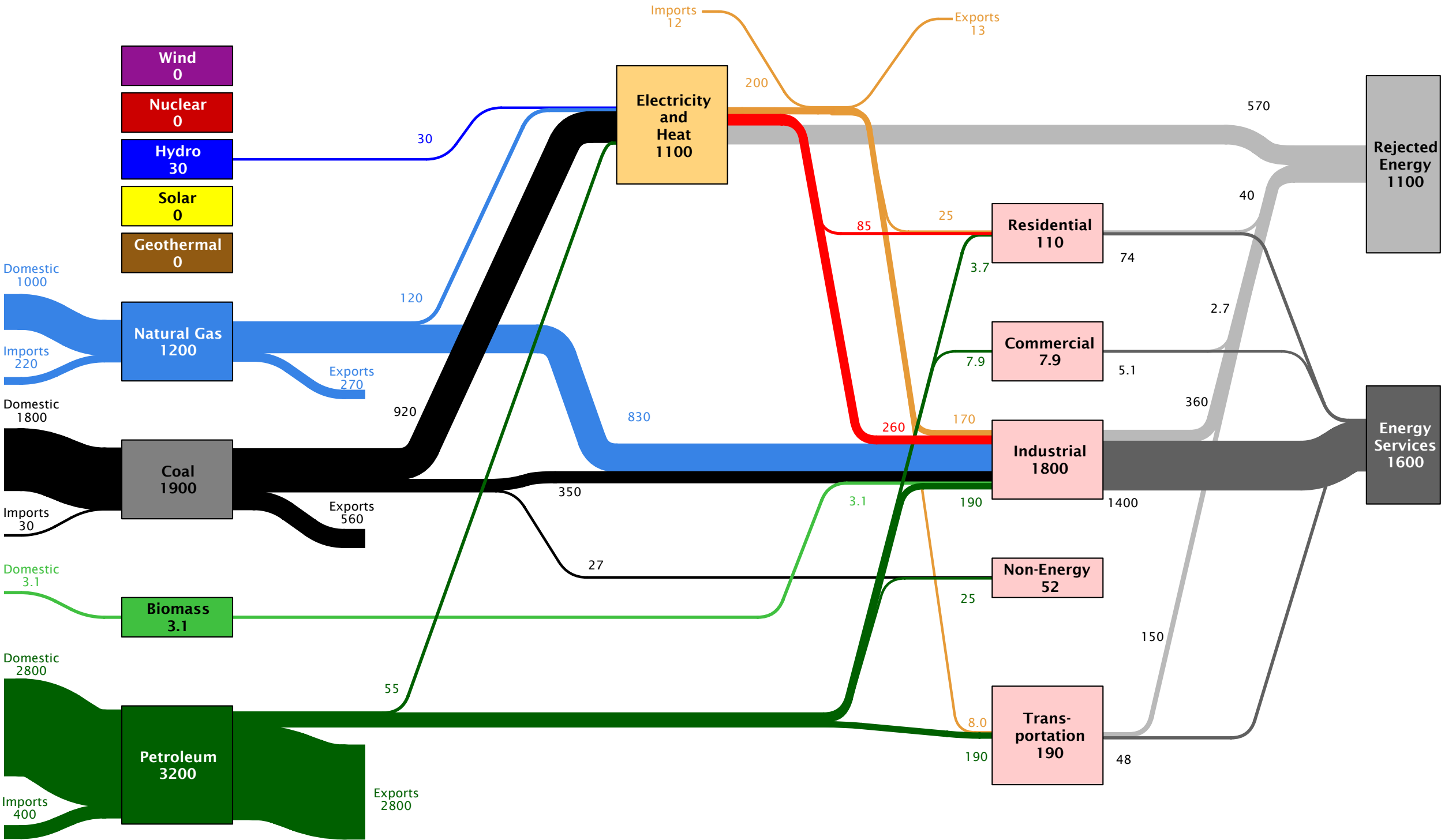
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Jordan Energy Flow  
in 2007: ~320 PJ



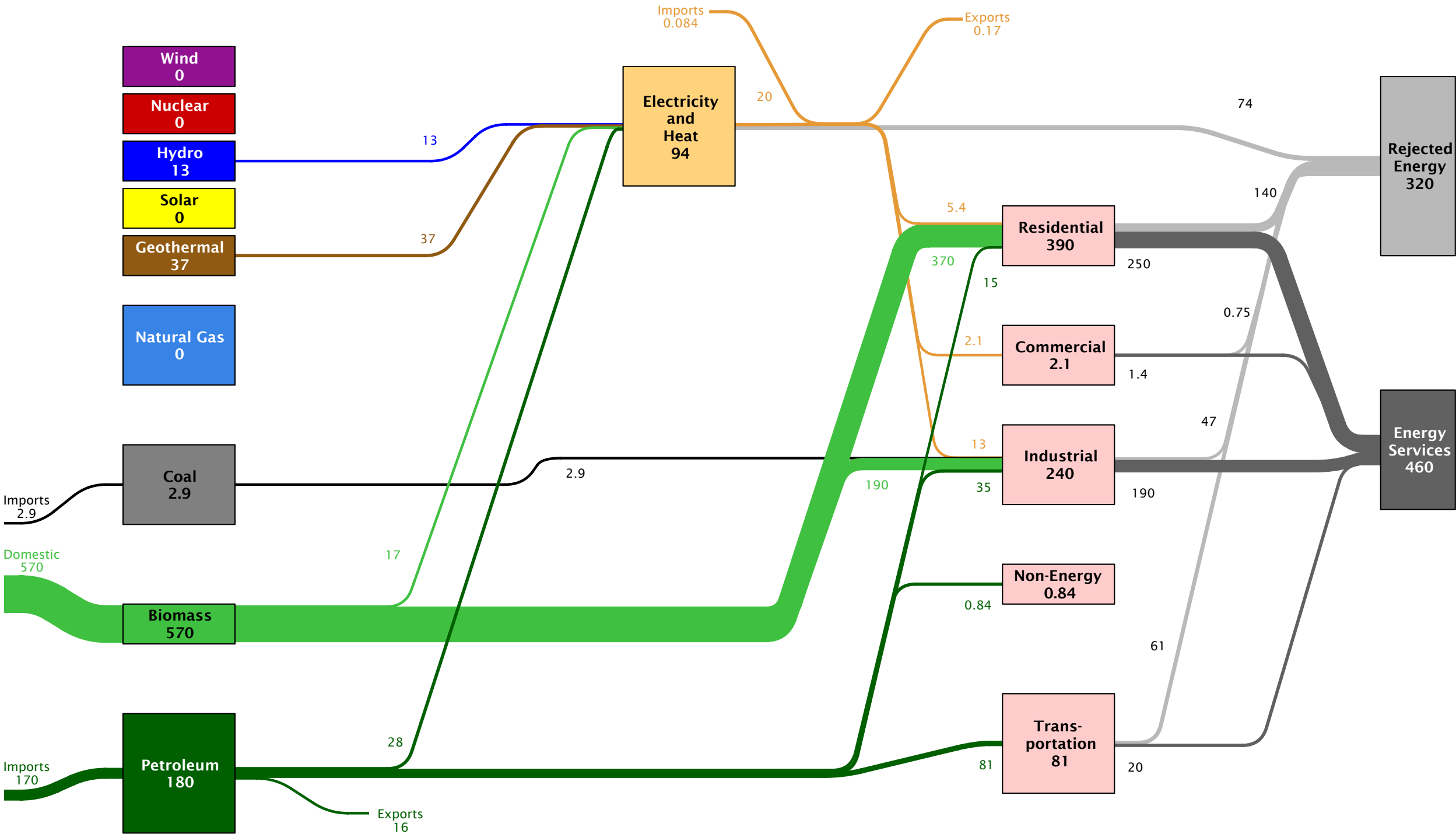
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Kazakhstan Energy Flow  
in 2007: ~2700 PJ



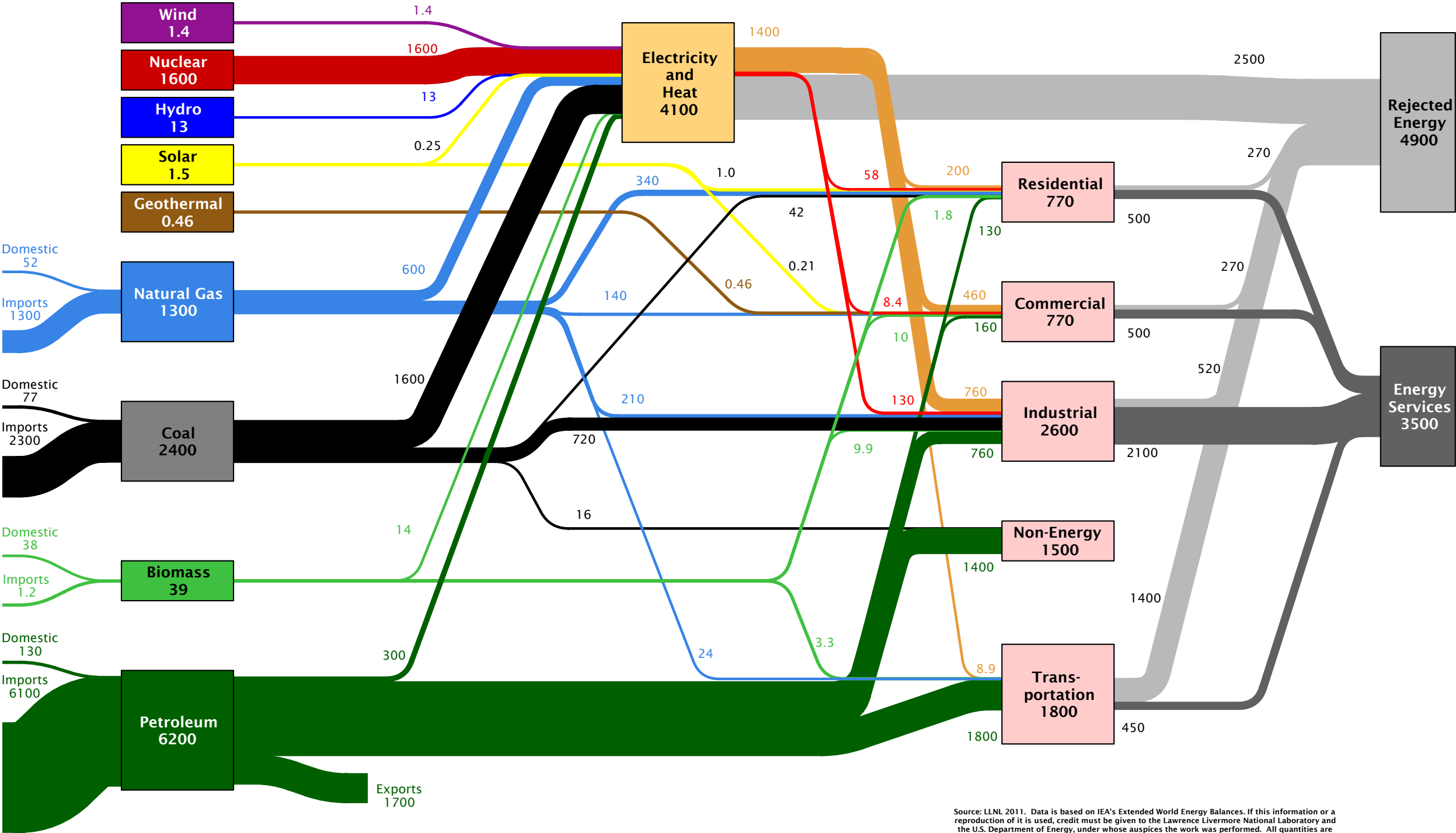
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Kenya Energy Flow  
in 2007: ~780 PJ



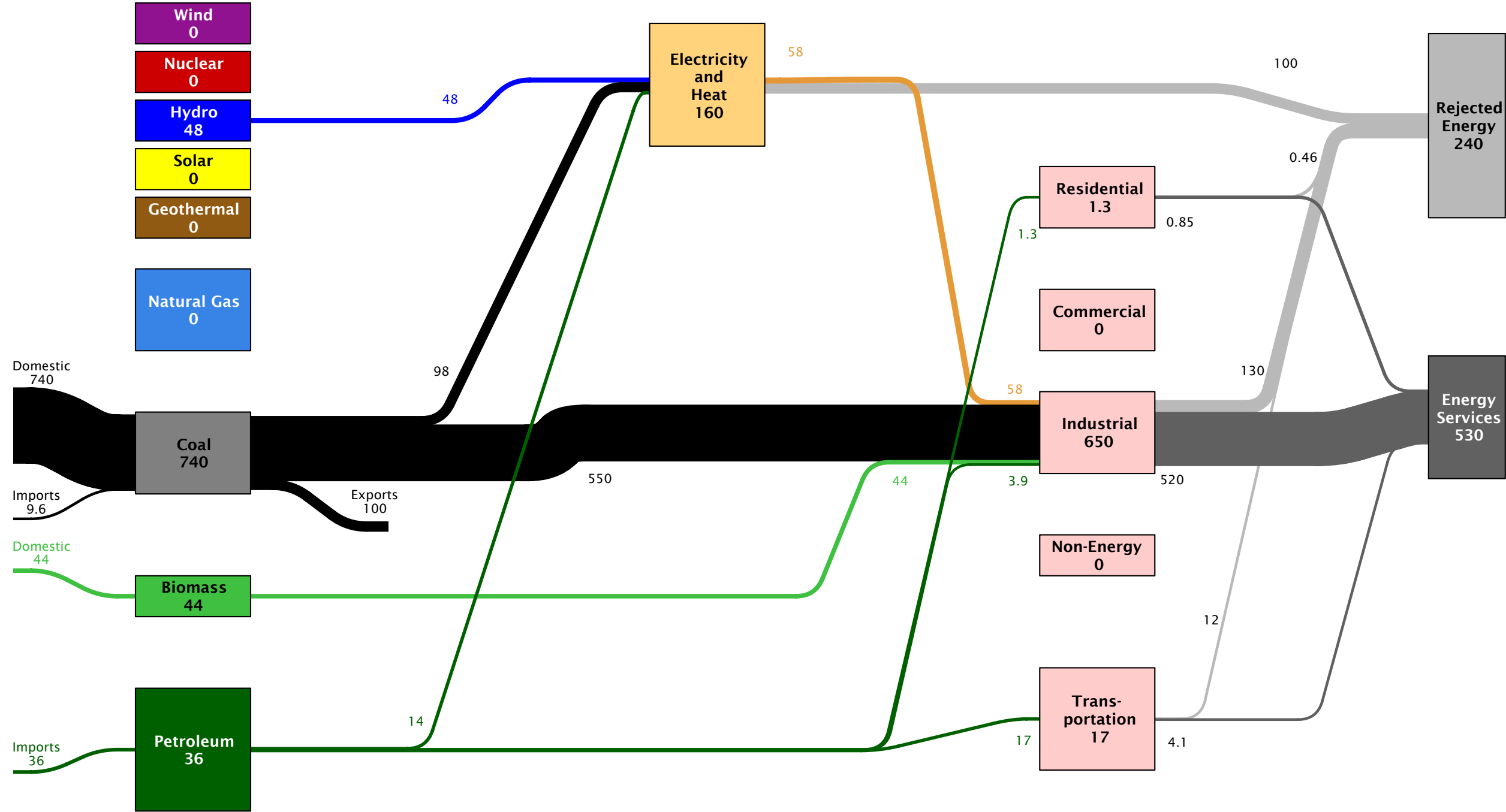
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Republic of Korea (South Korea)  
Energy Flow in 2007: ~9900 PJ



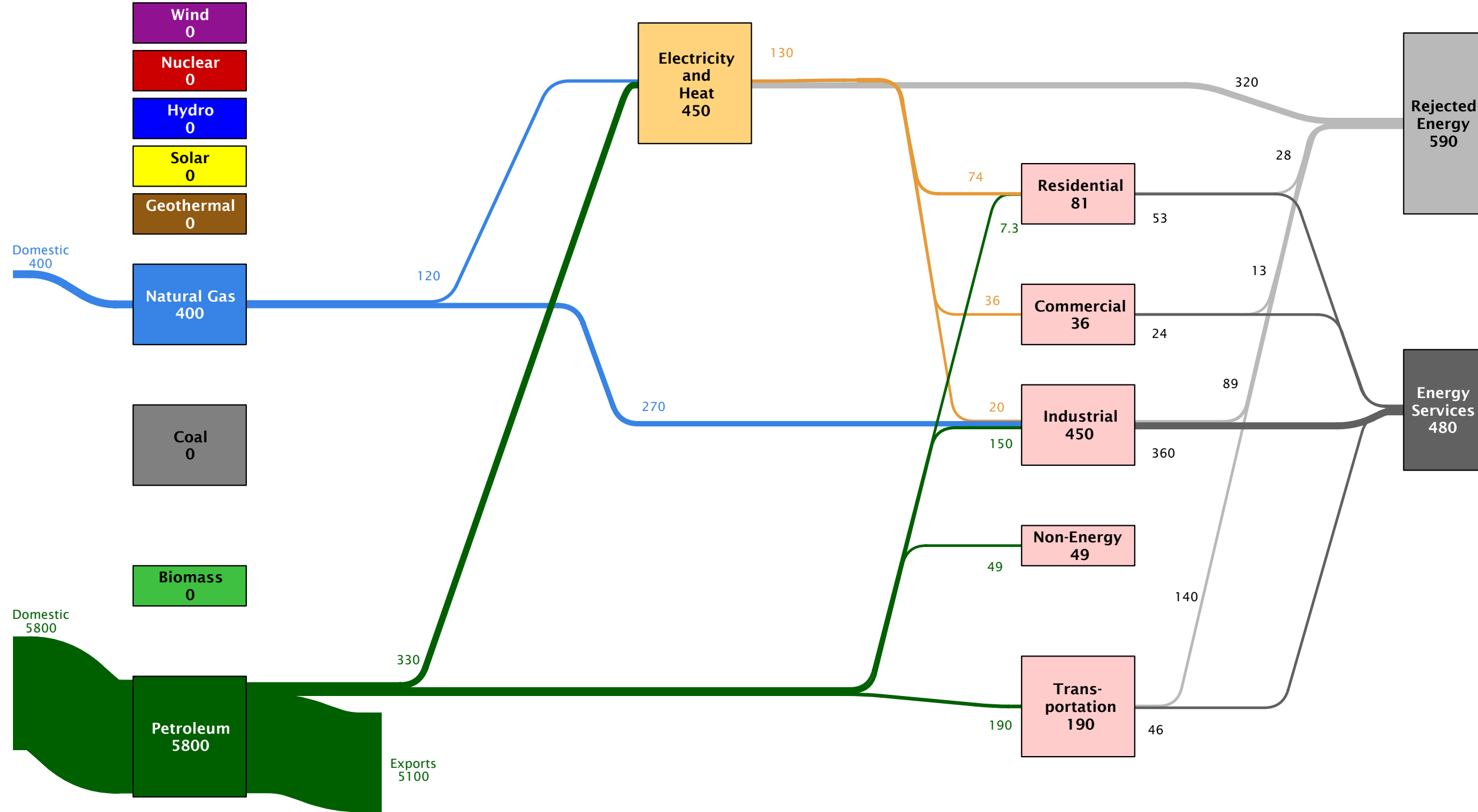
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Democratic People's Republic of Korea  
(North Korea) Energy Flow in 2007: ~770 PJ



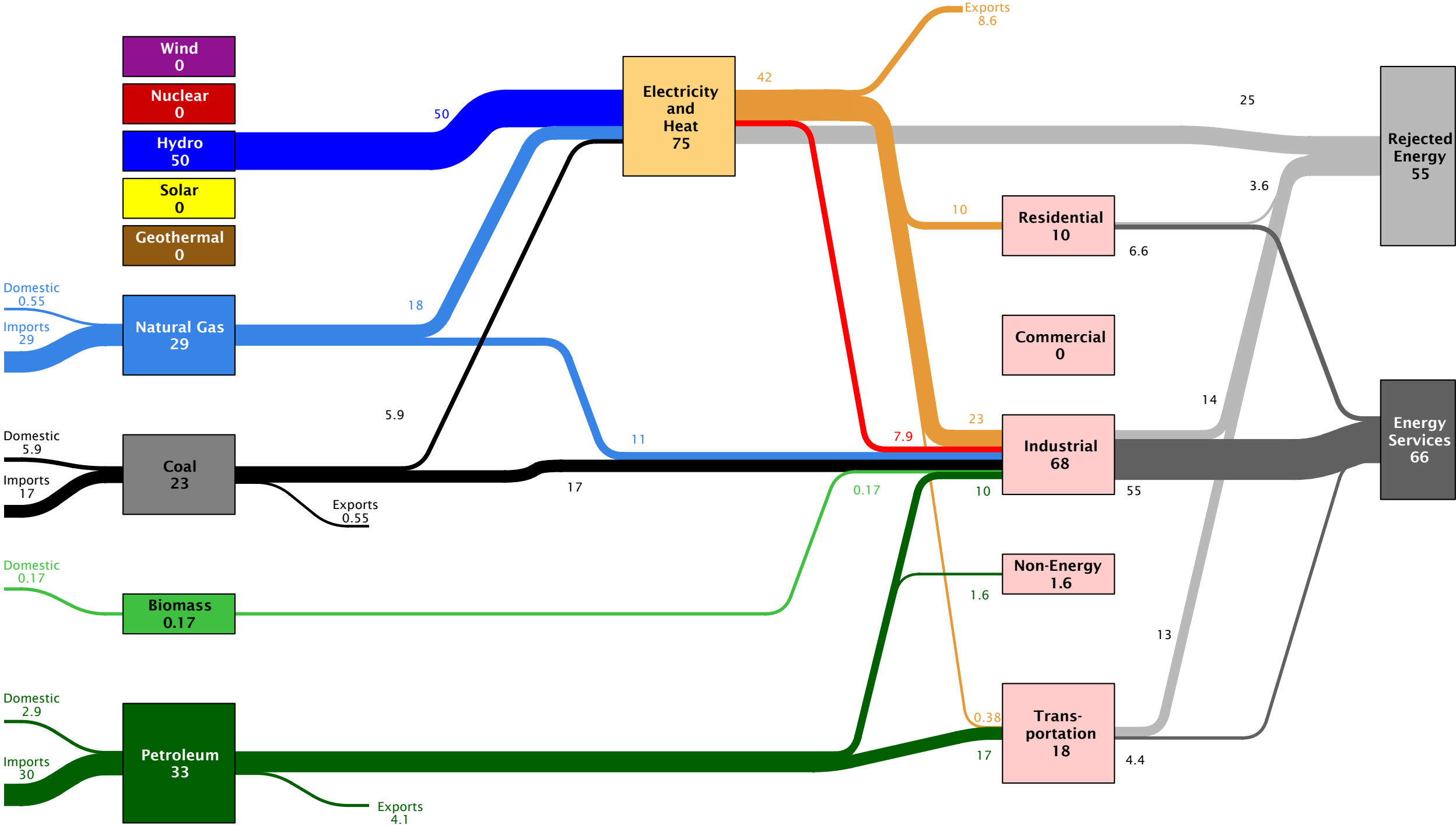
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Kuwait Energy Flow  
in 2007: ~1100 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

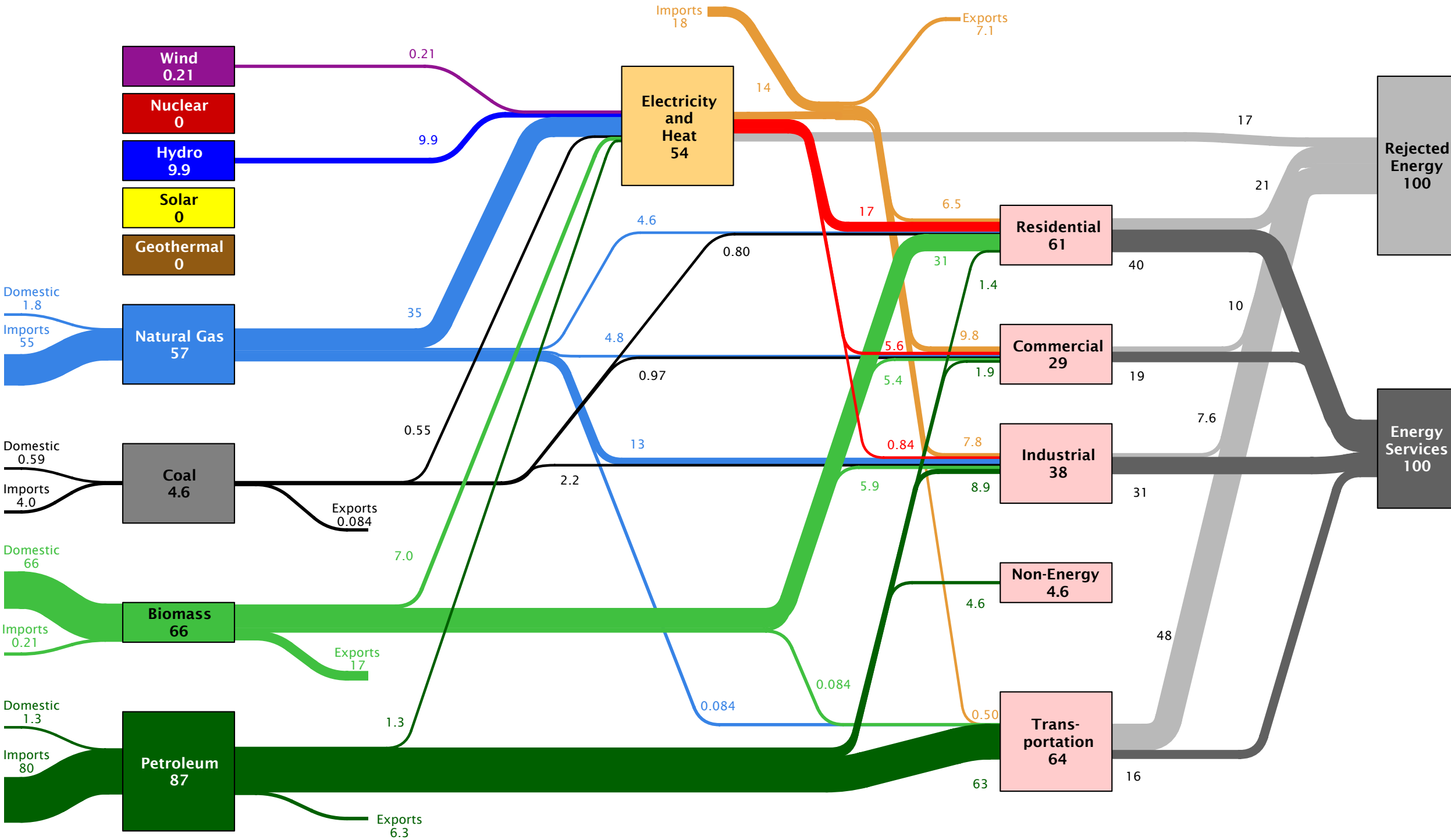
Kyrgyzstan Energy Flow  
in 2007: ~120 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

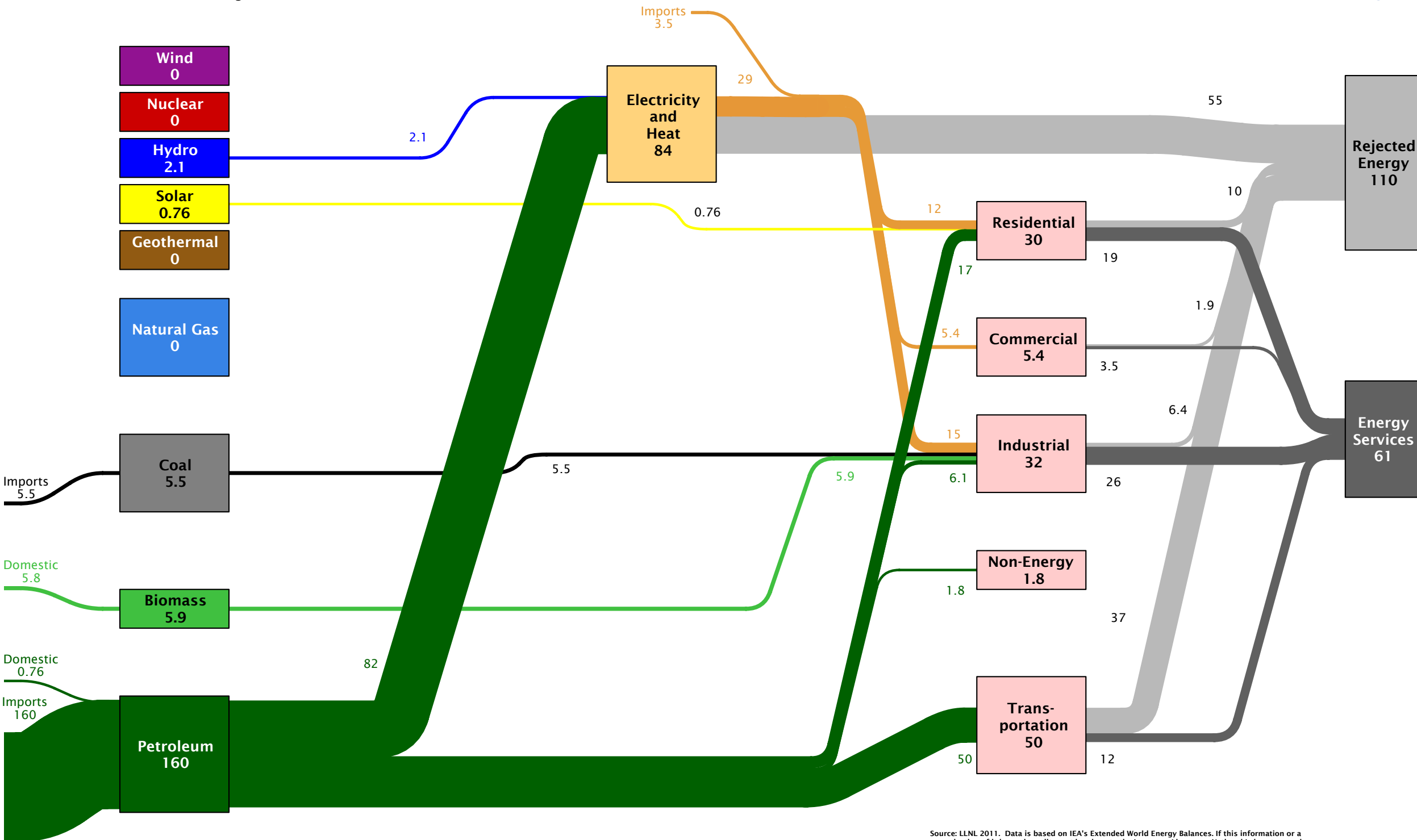


Latvia Energy Flow  
in 2007: ~210 PJ



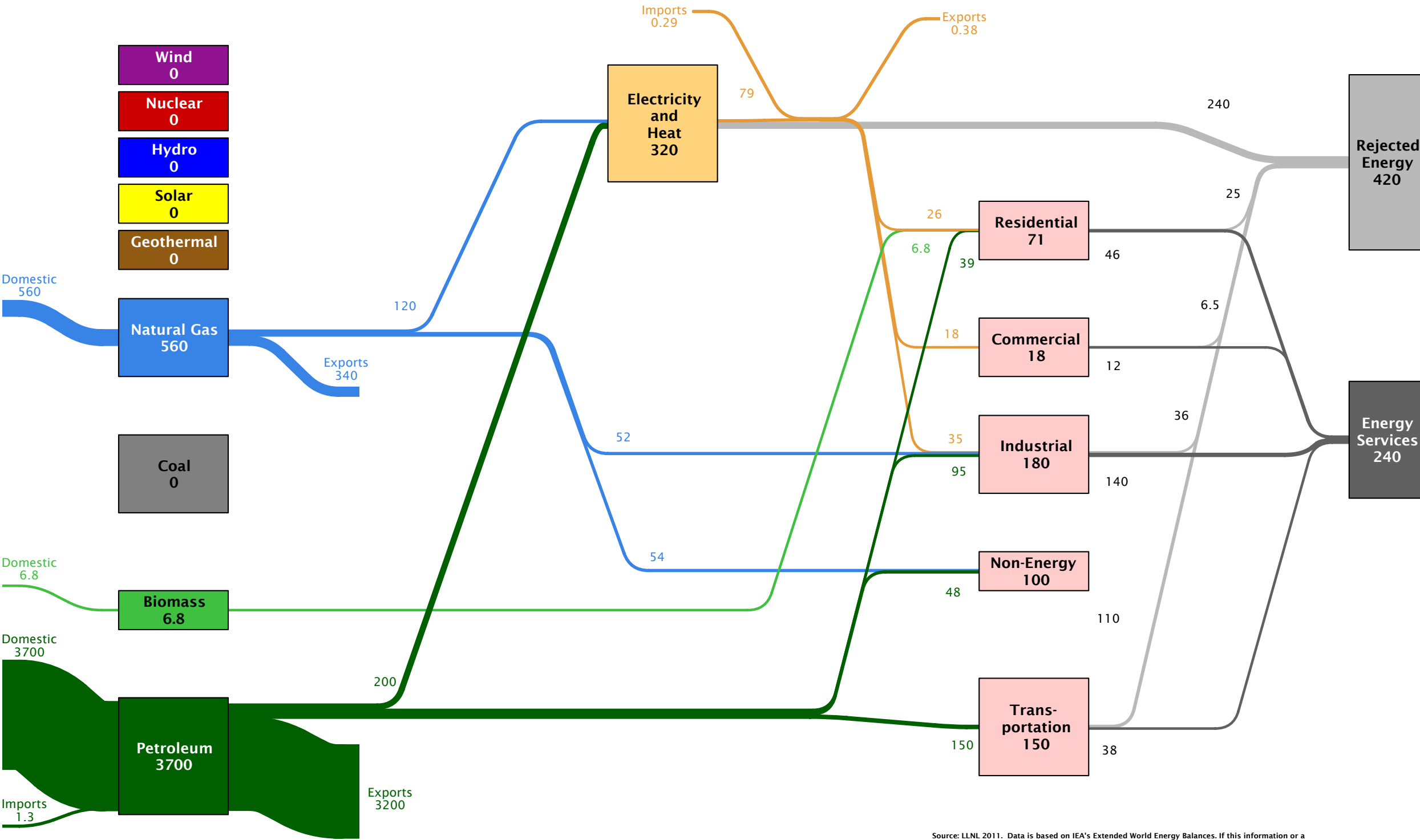
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Lebanon Energy Flow  
in 2007: ~170 PJ



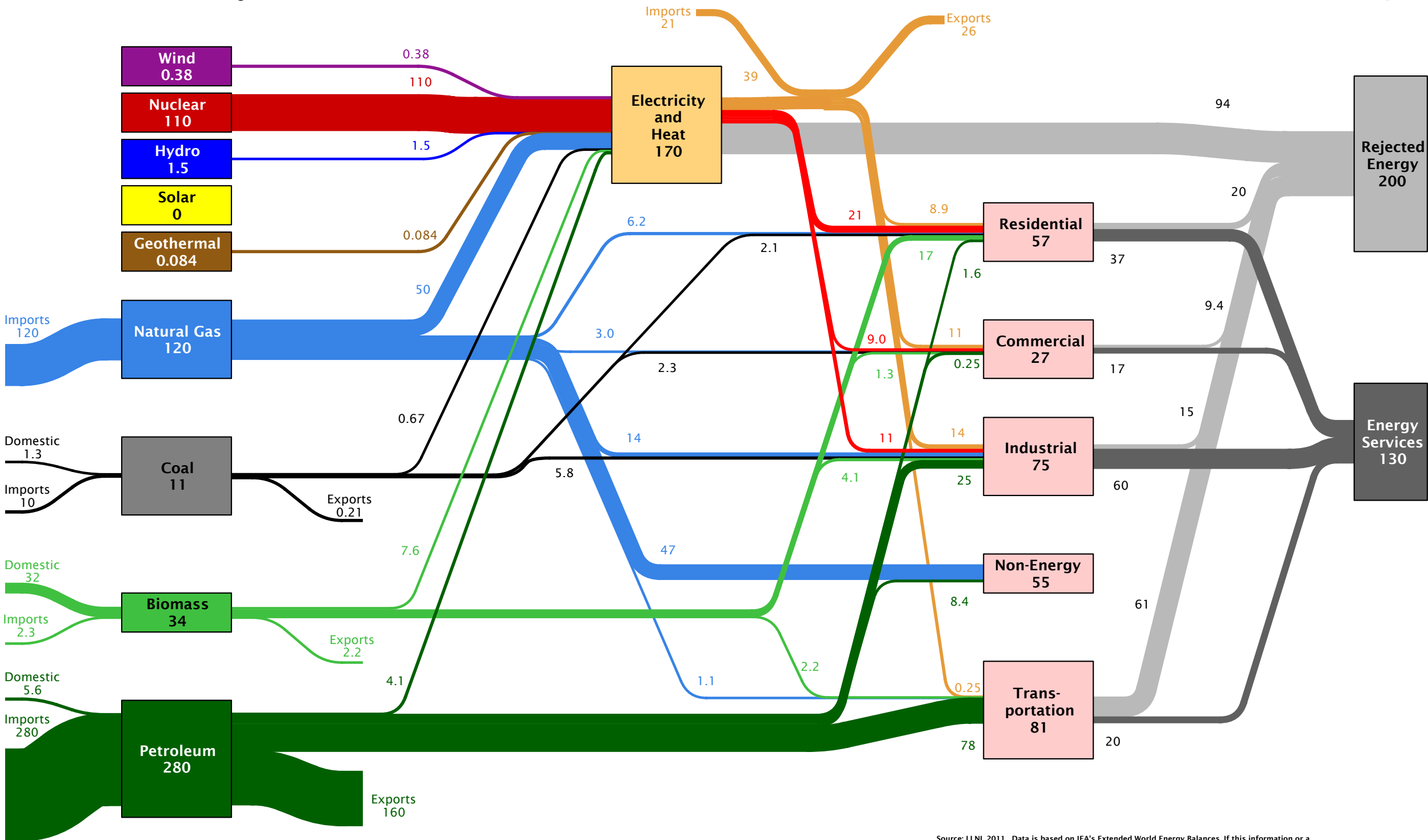
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Libya Energy Flow  
in 2007: ~760 PJ



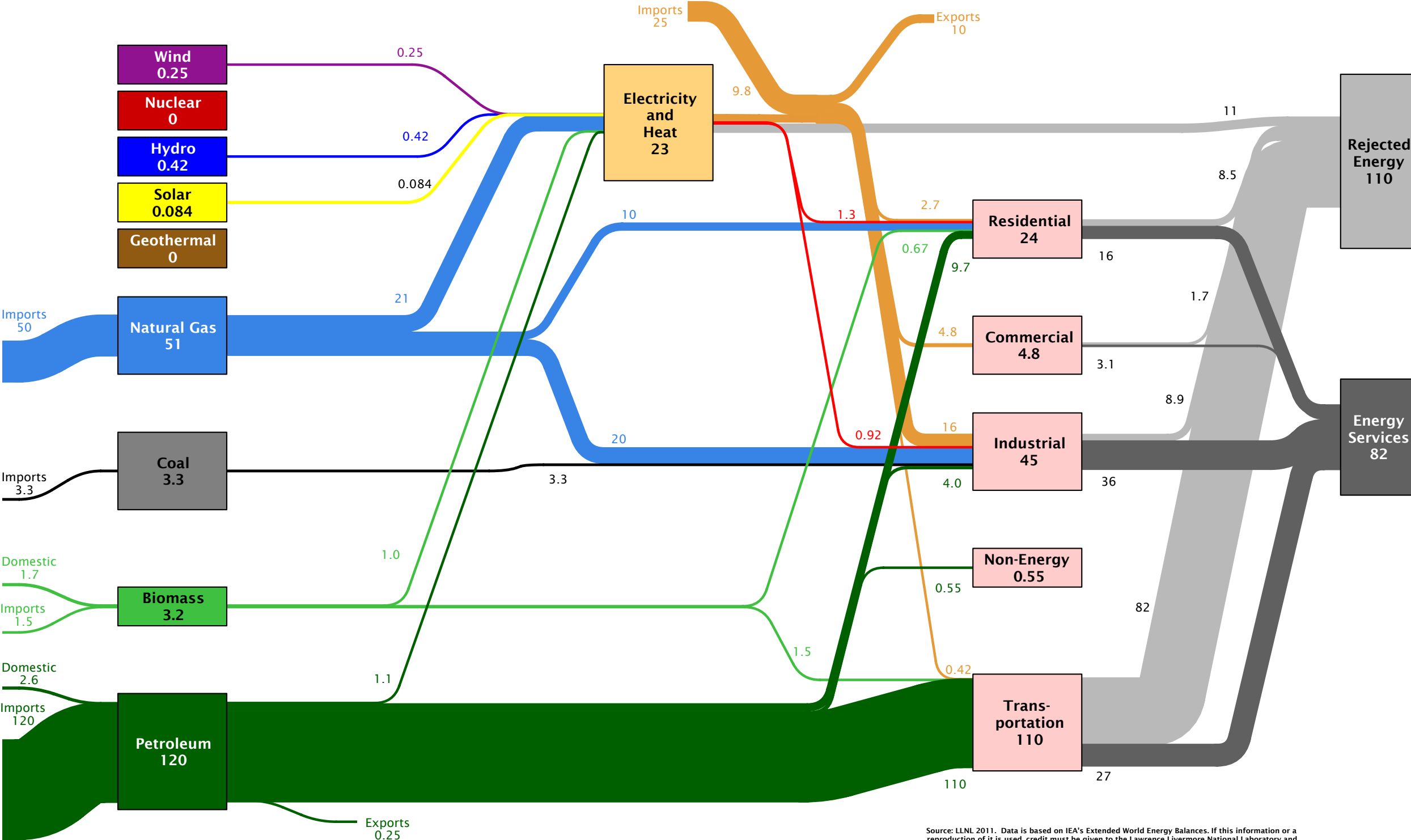
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Lithuania Energy Flow  
in 2007: ~390 PJ



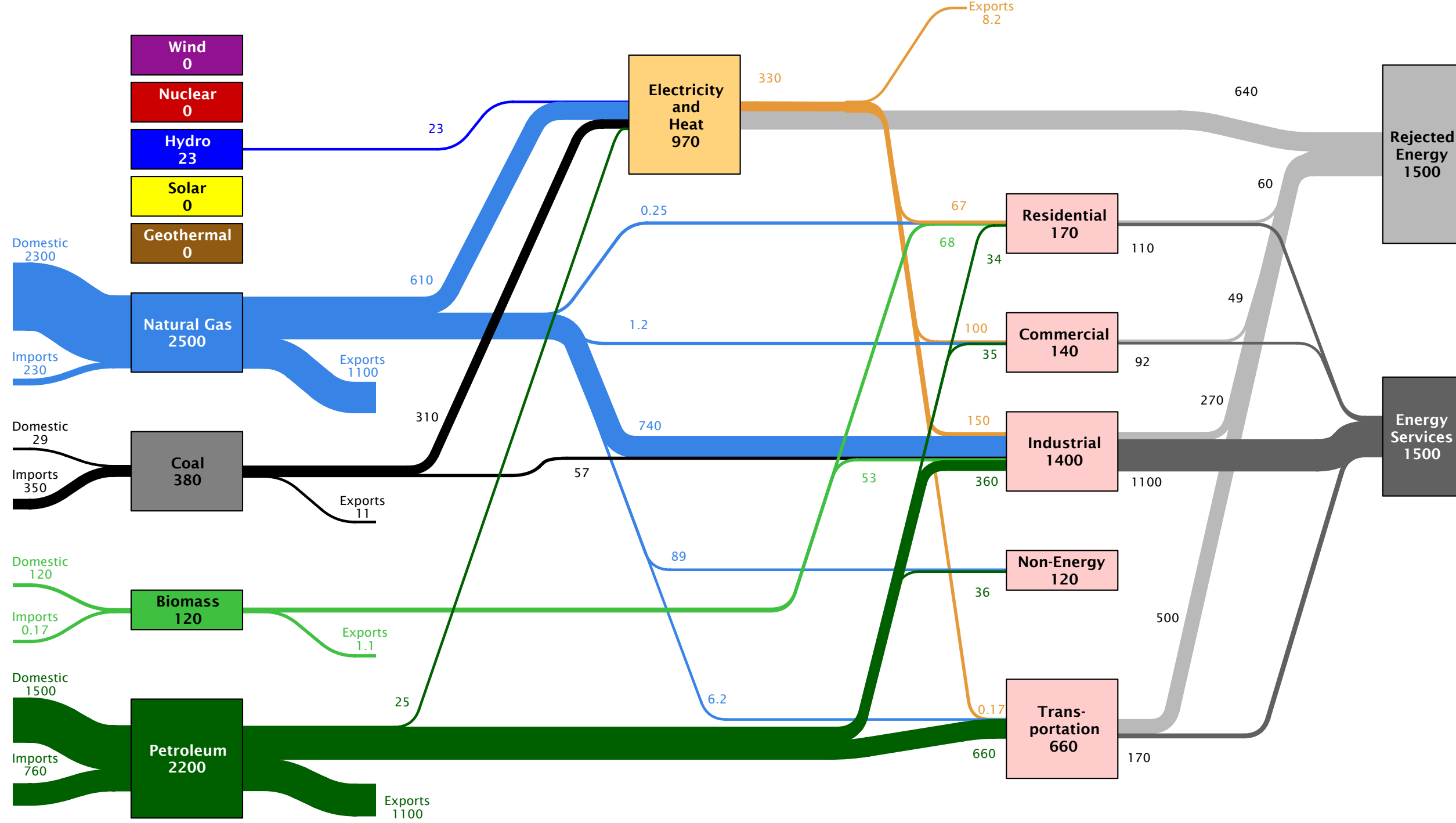
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Luxembourg Energy Flow  
in 2007: ~200 PJ



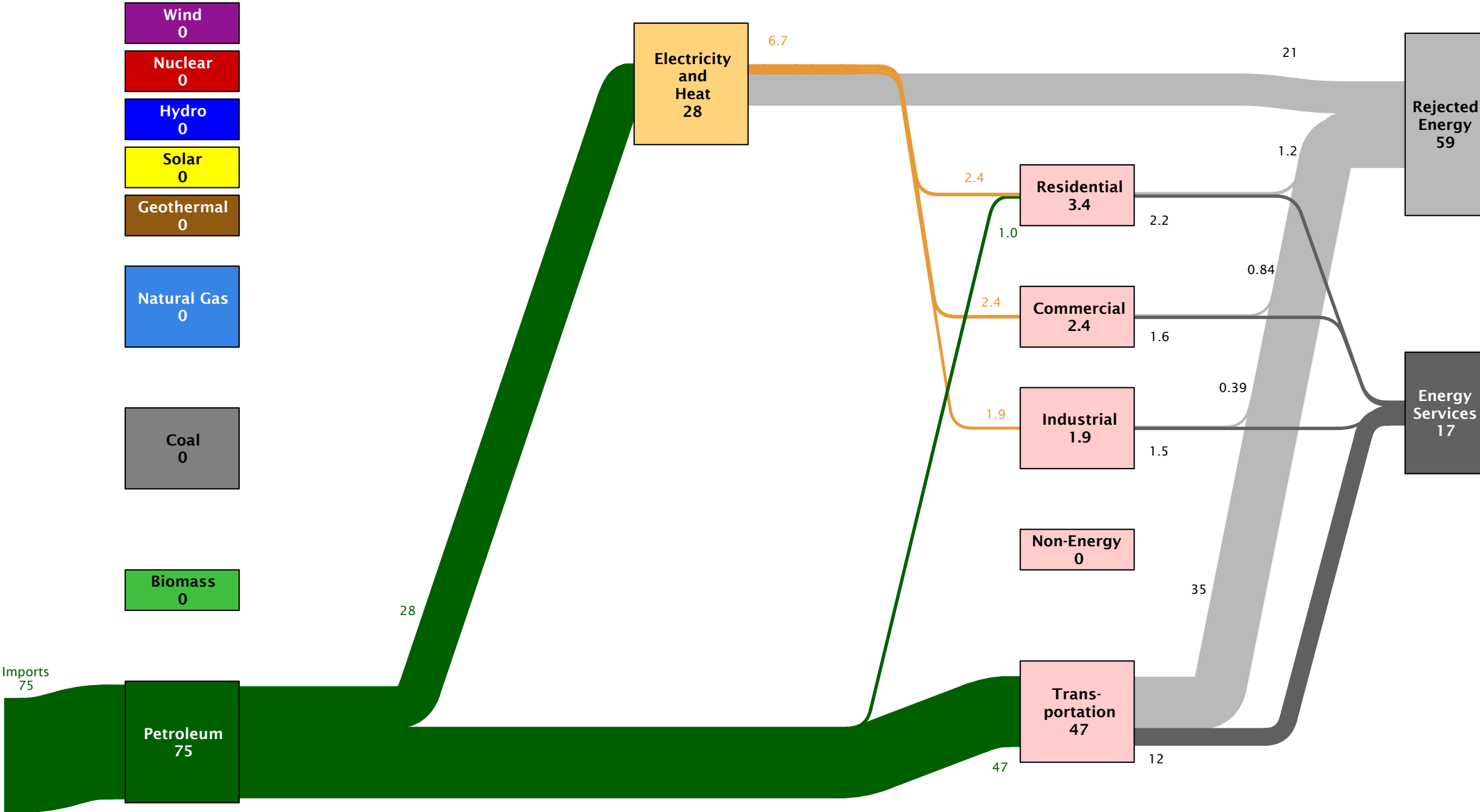
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Malaysia Energy Flow  
in 2007: ~3100 PJ



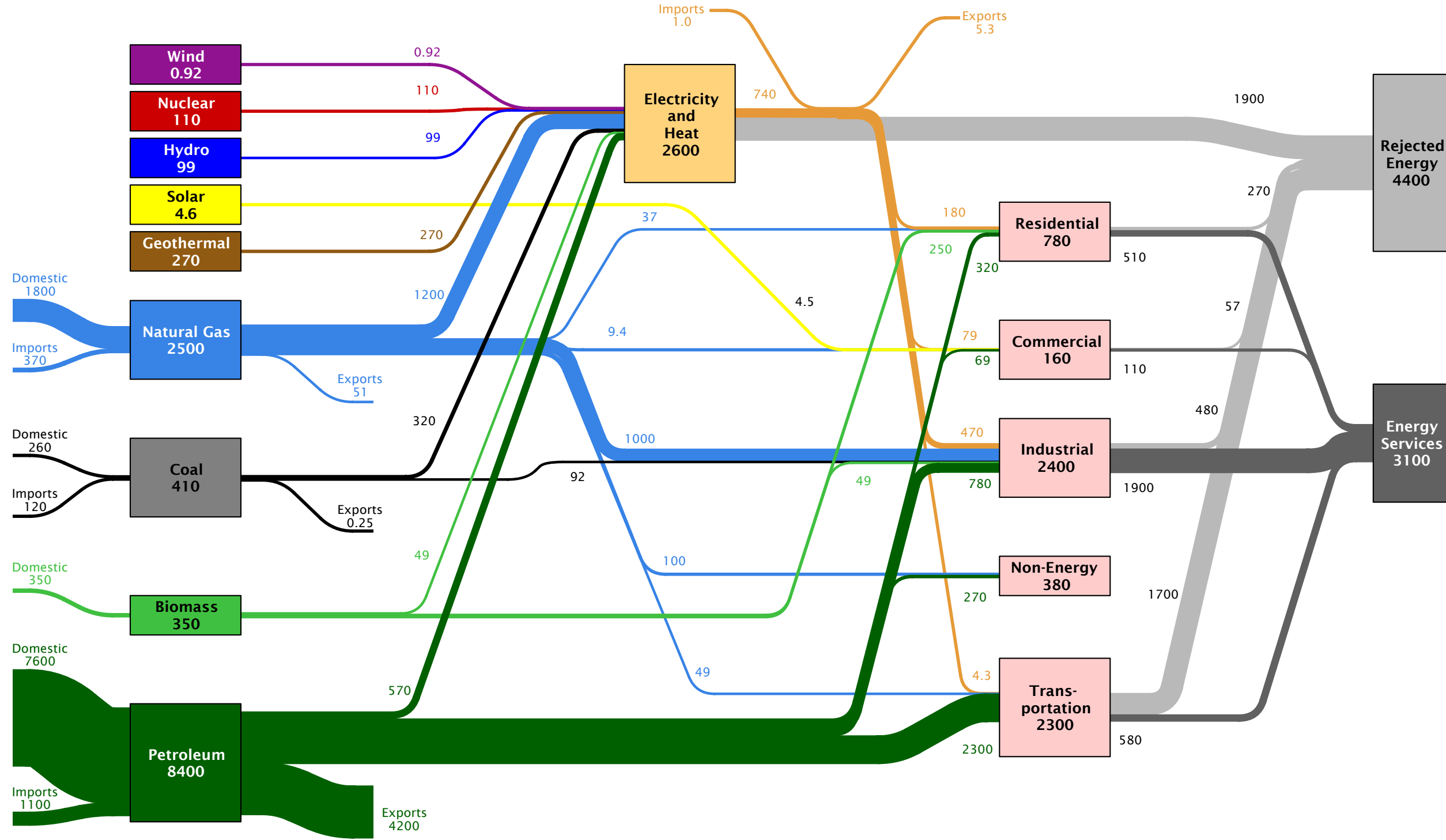
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Malta Energy Flow  
in 2007: ~75 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

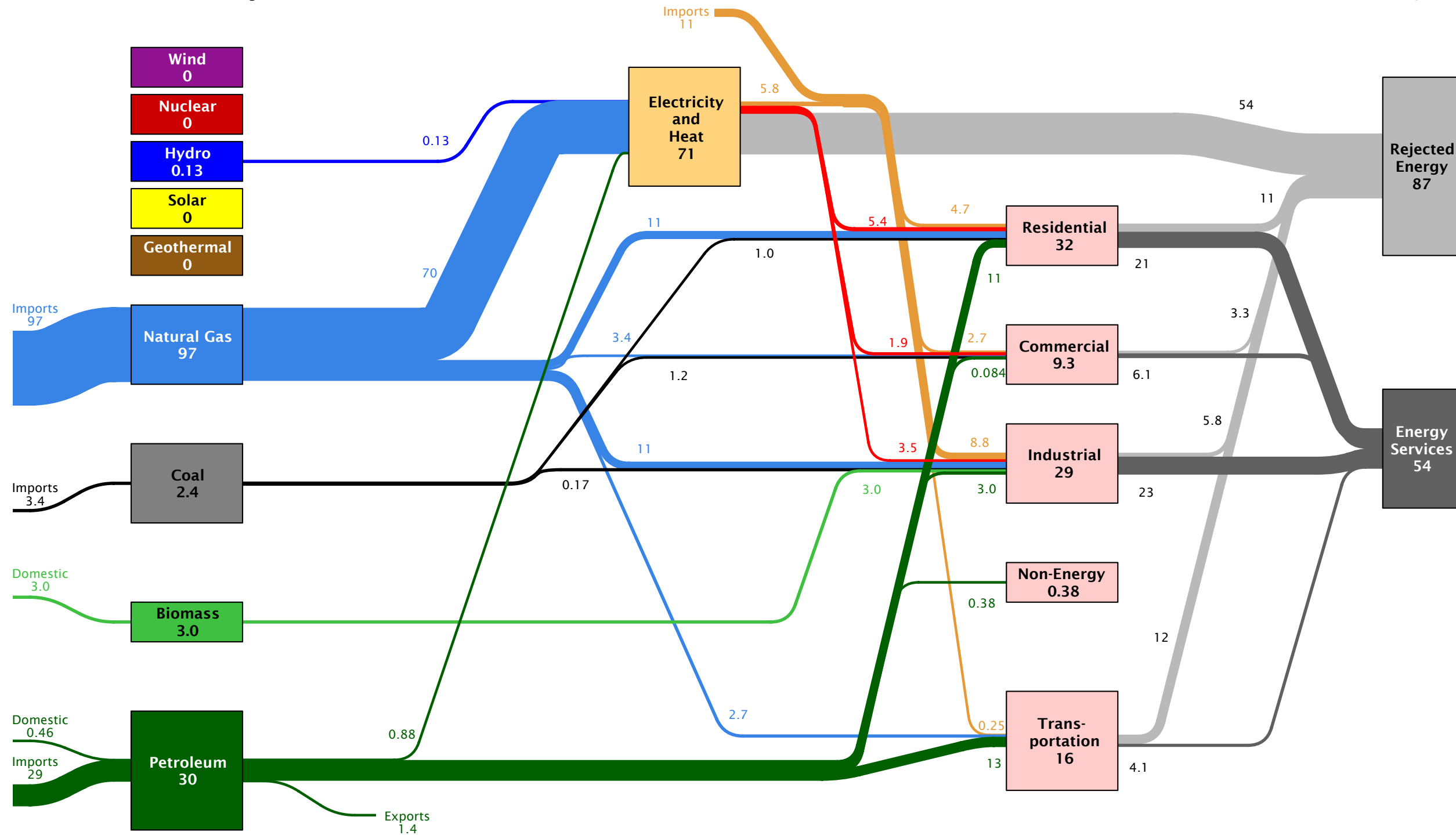
Mexico Energy Flow  
in 2007: ~7900 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

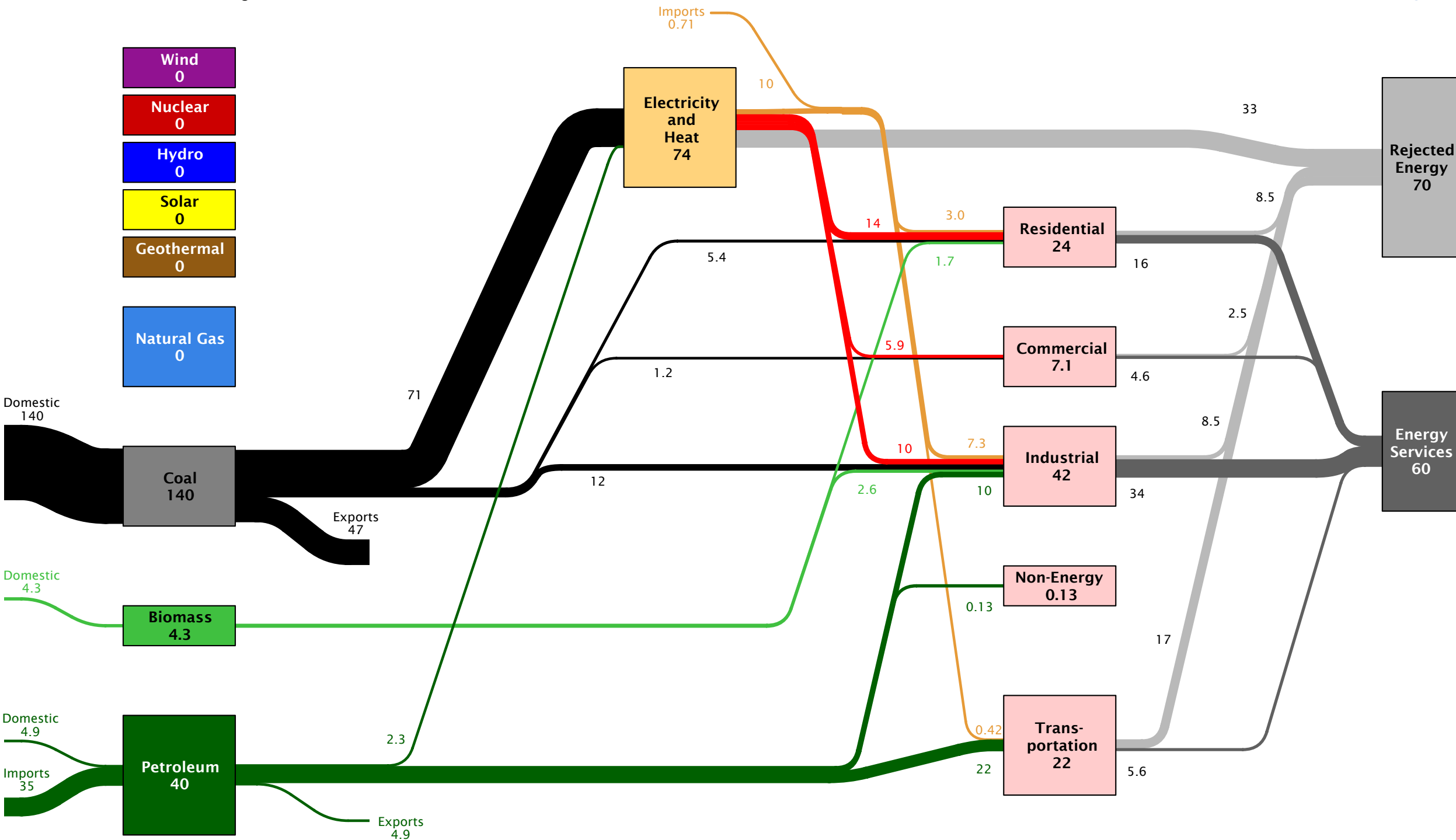


Moldova Energy Flow  
in 2007: ~140 PJ



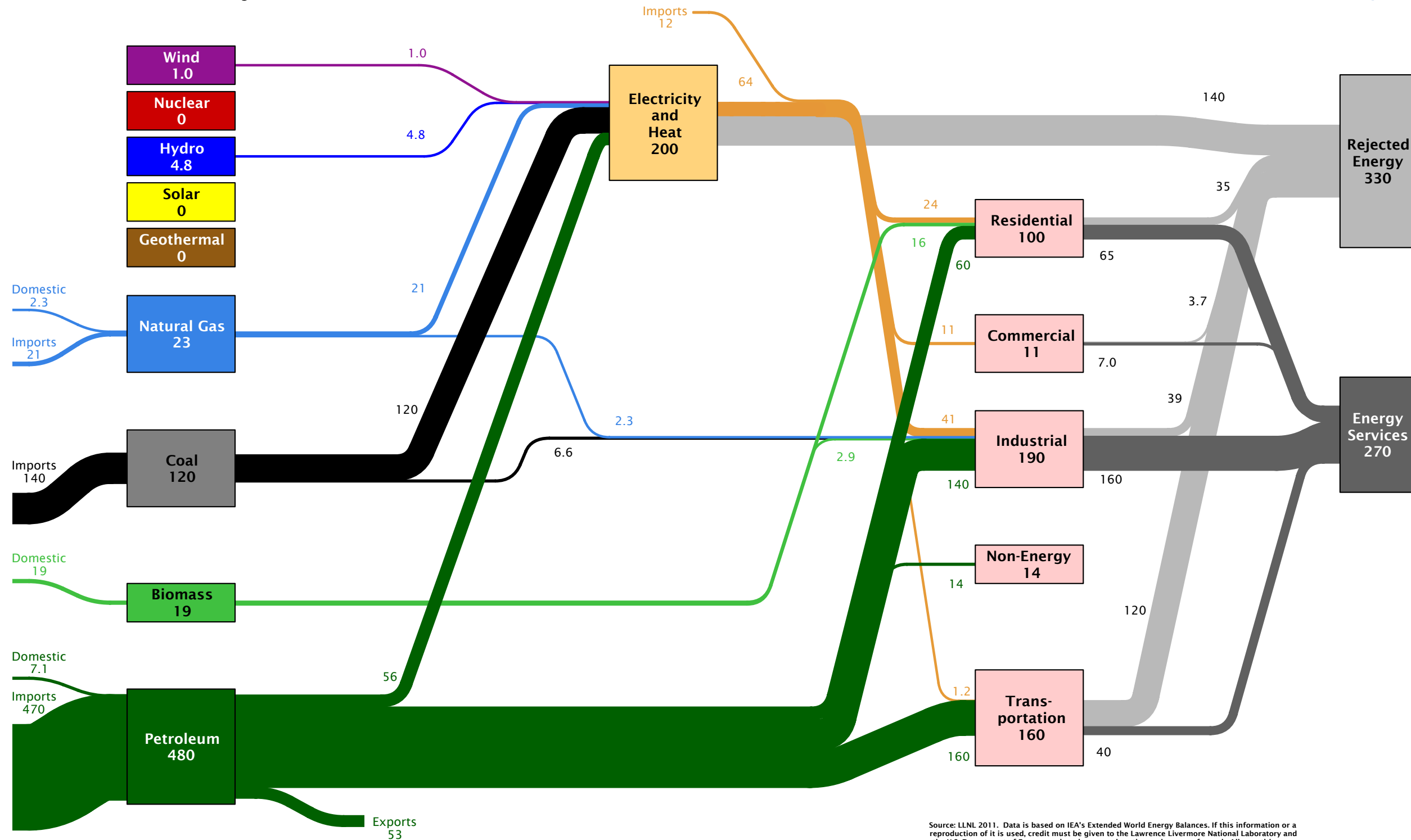
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Mongolia Energy Flow  
in 2007: ~130 PJ



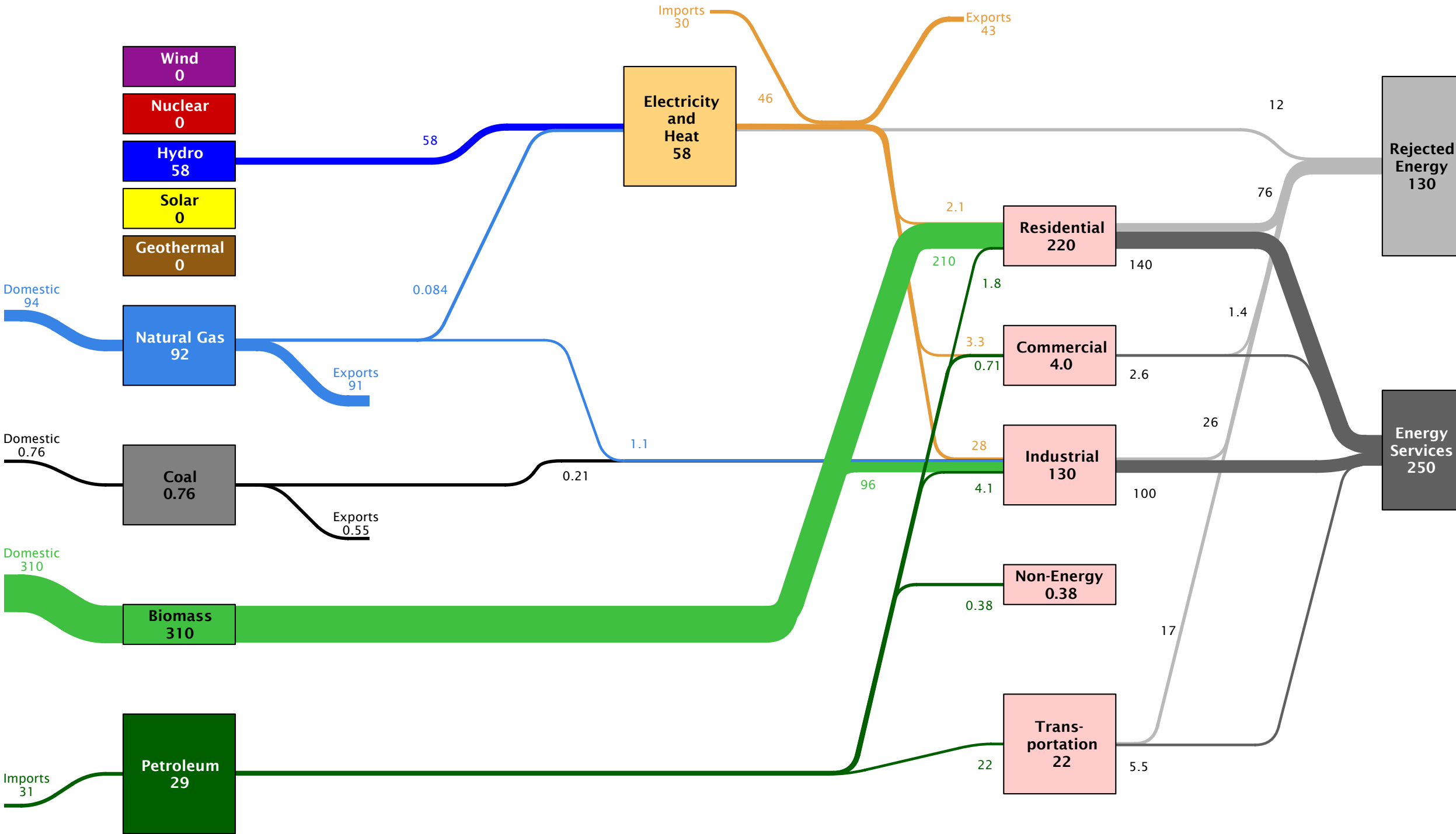
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Morocco Energy Flow  
in 2007: ~610 PJ



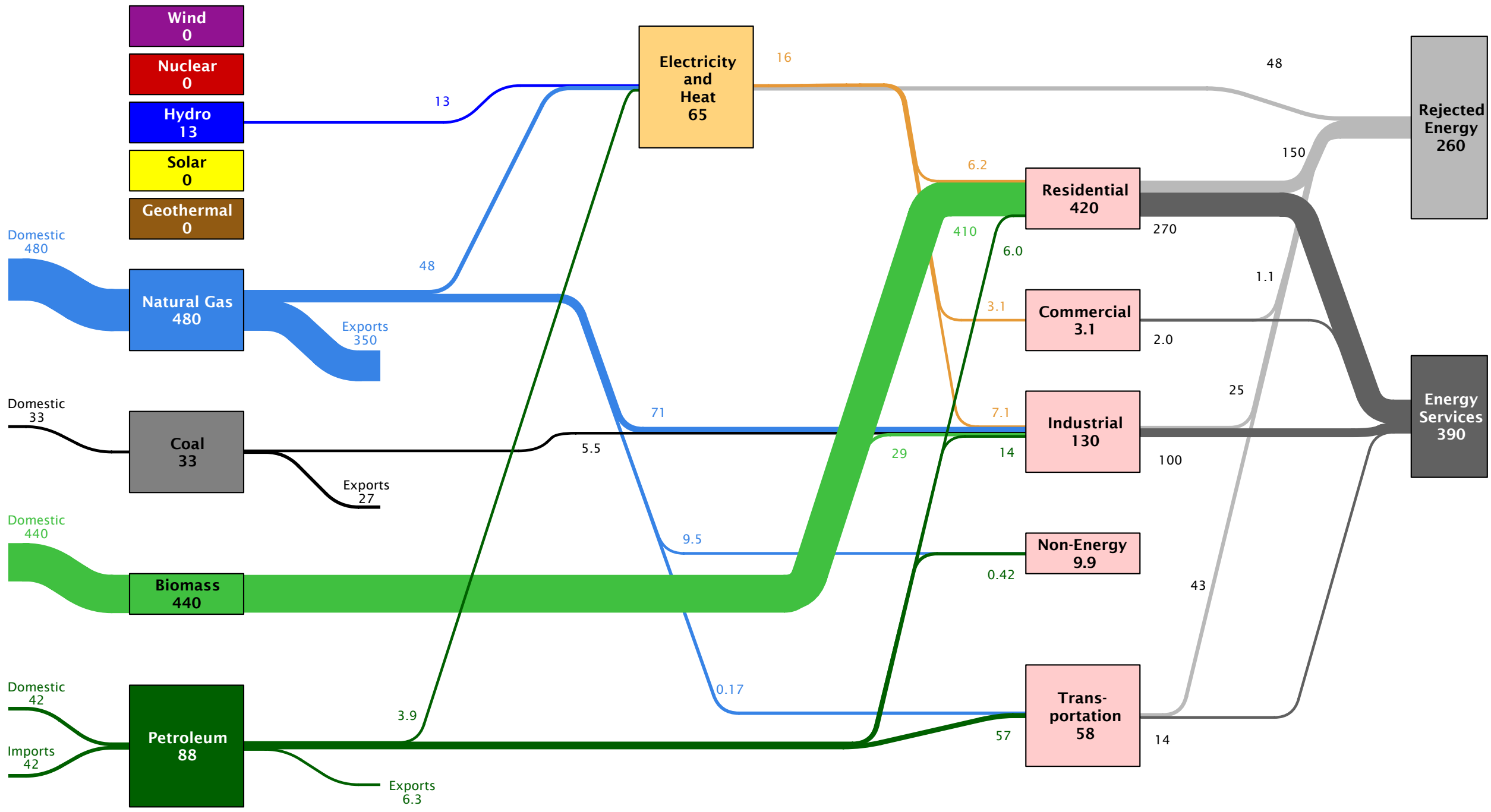
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Mozambique Energy Flow  
in 2007: ~380 PJ



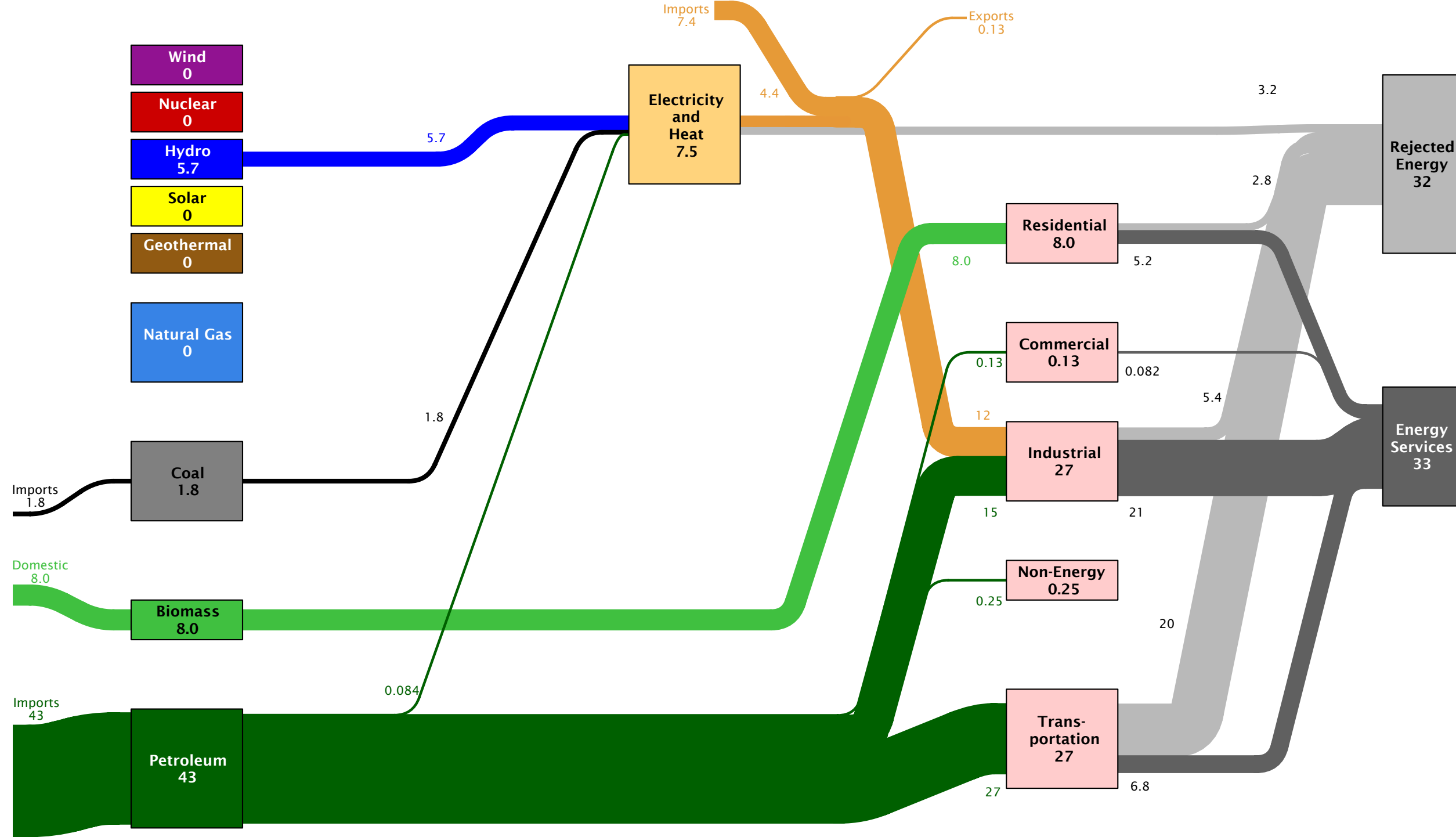
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Myanmar Energy Flow  
in 2007: ~660 PJ



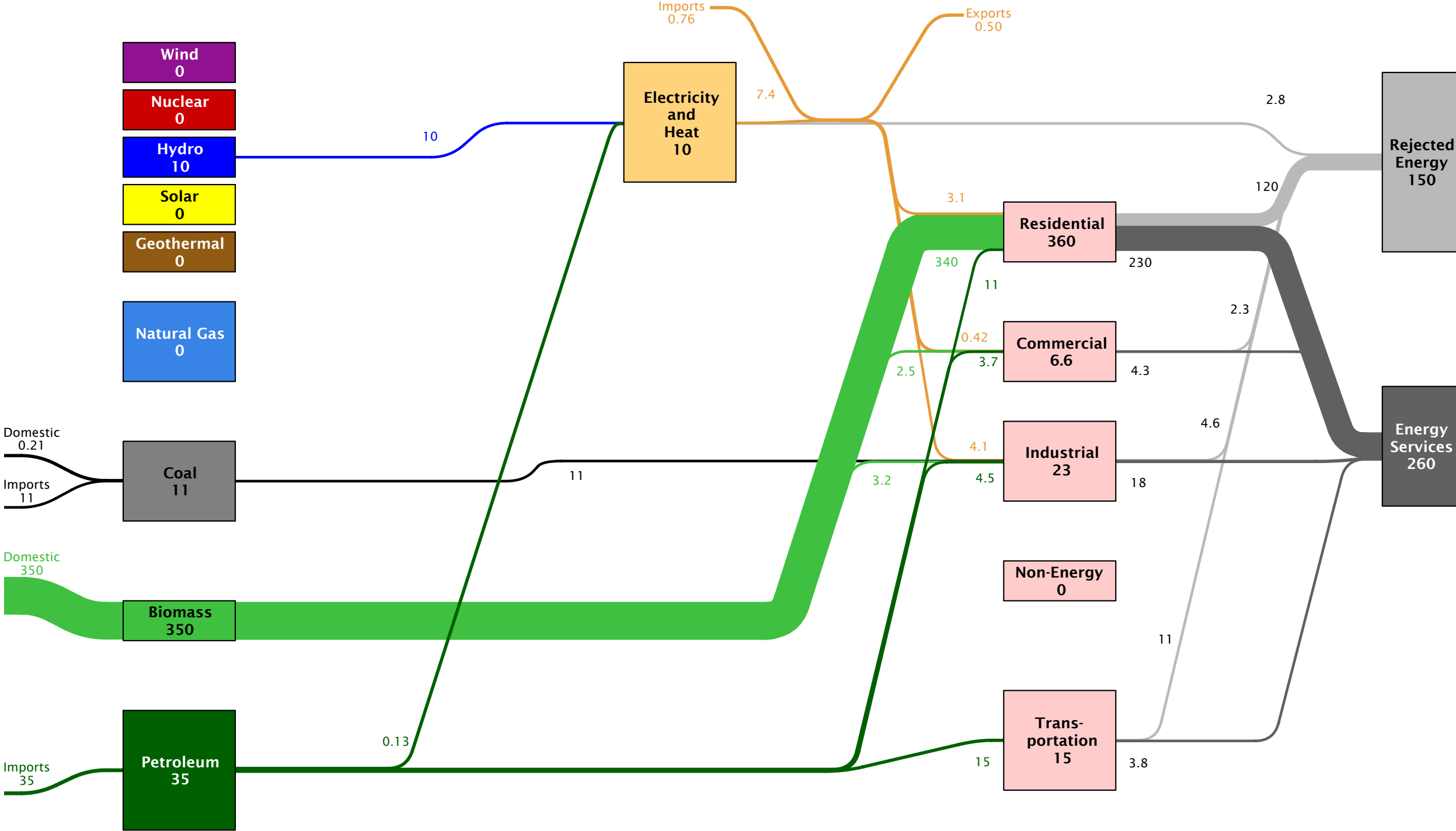
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Namibia Energy Flow  
in 2007: ~65 PJ



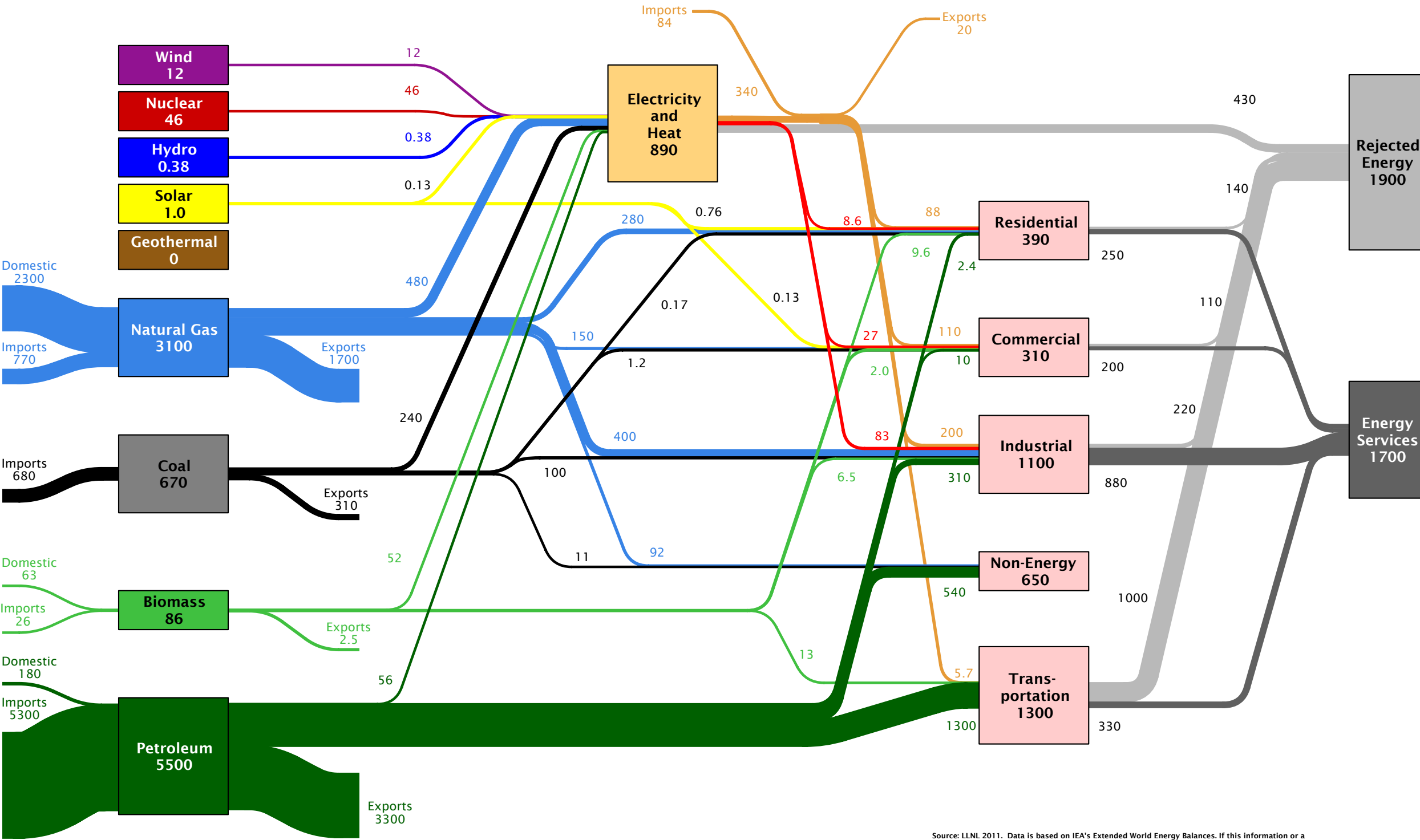
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Nepal Energy Flow  
in 2007: ~400 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

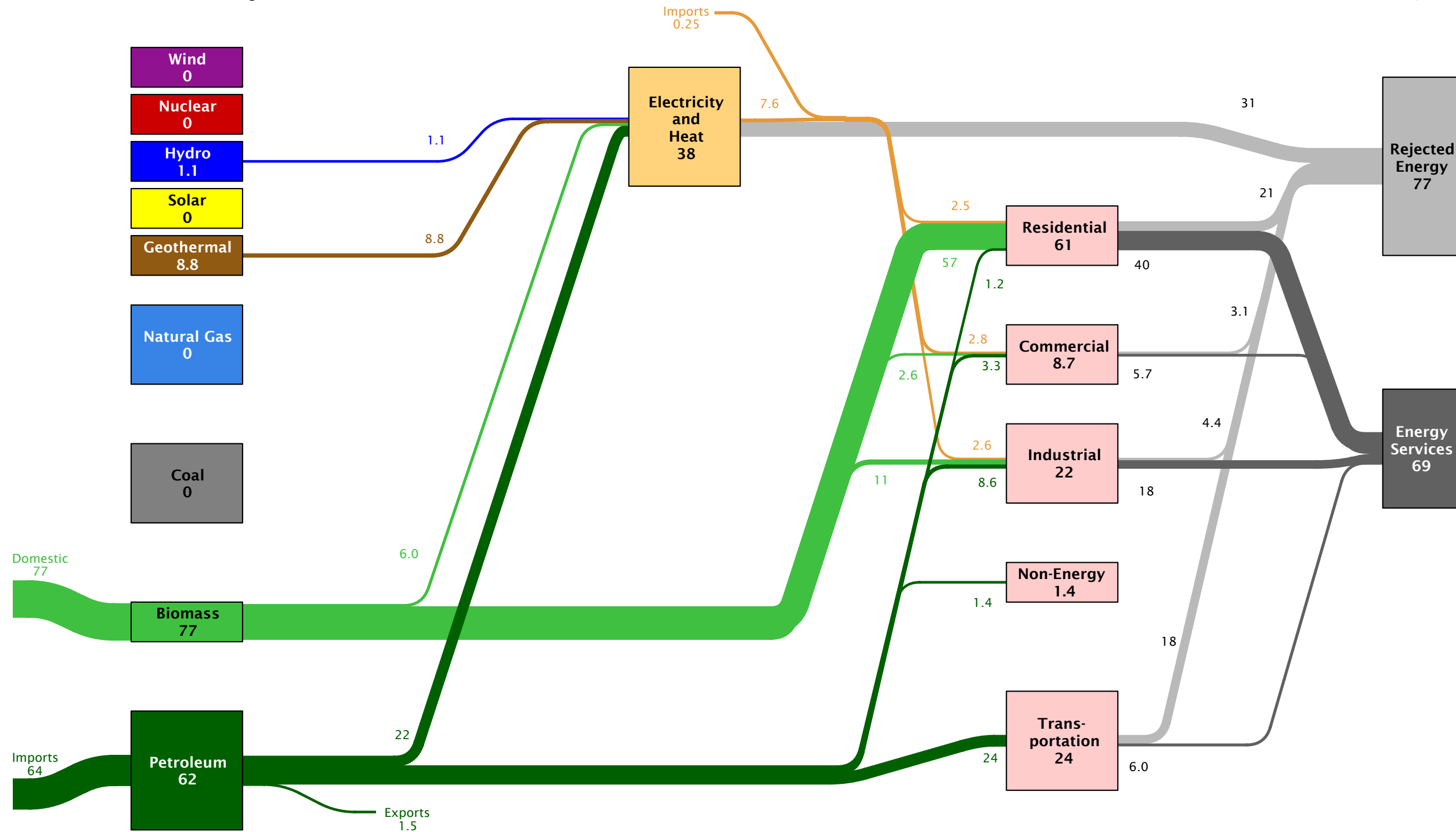
Netherlands Energy Flow  
in 2007: ~4200 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

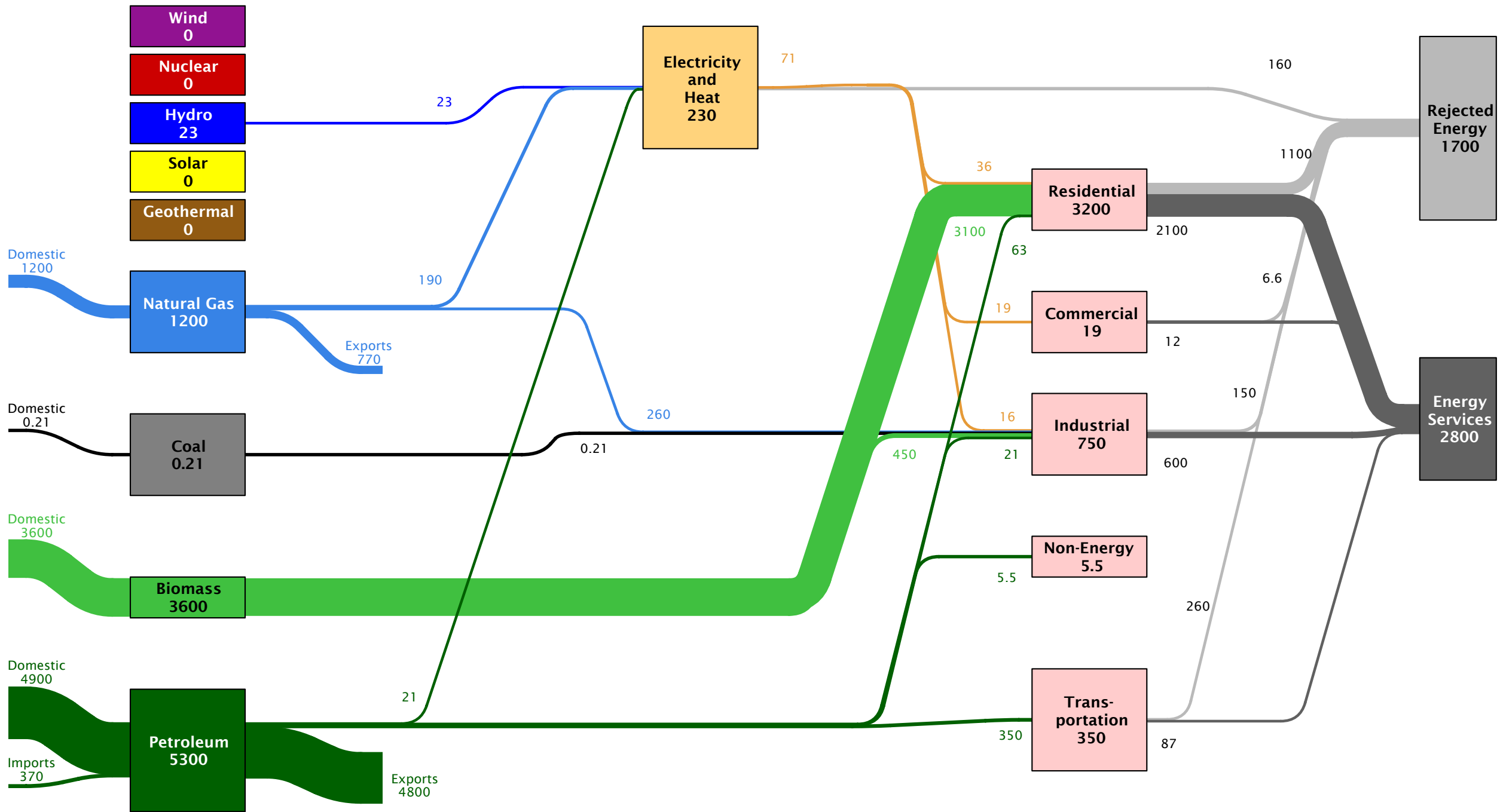


Nicaragua Energy Flow  
in 2007: ~150 PJ



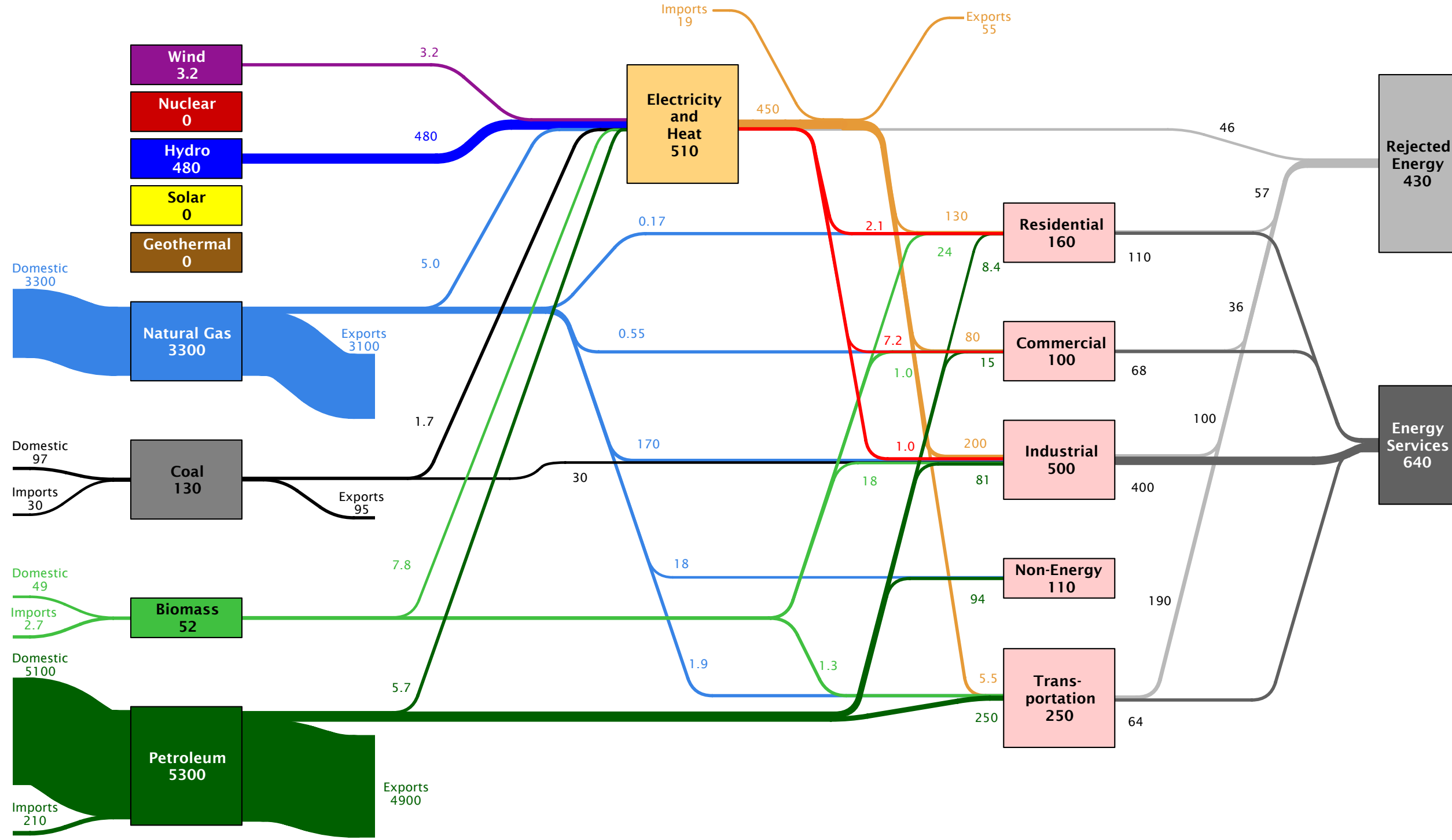
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Nigeria Energy Flow  
in 2007: ~4500 PJ



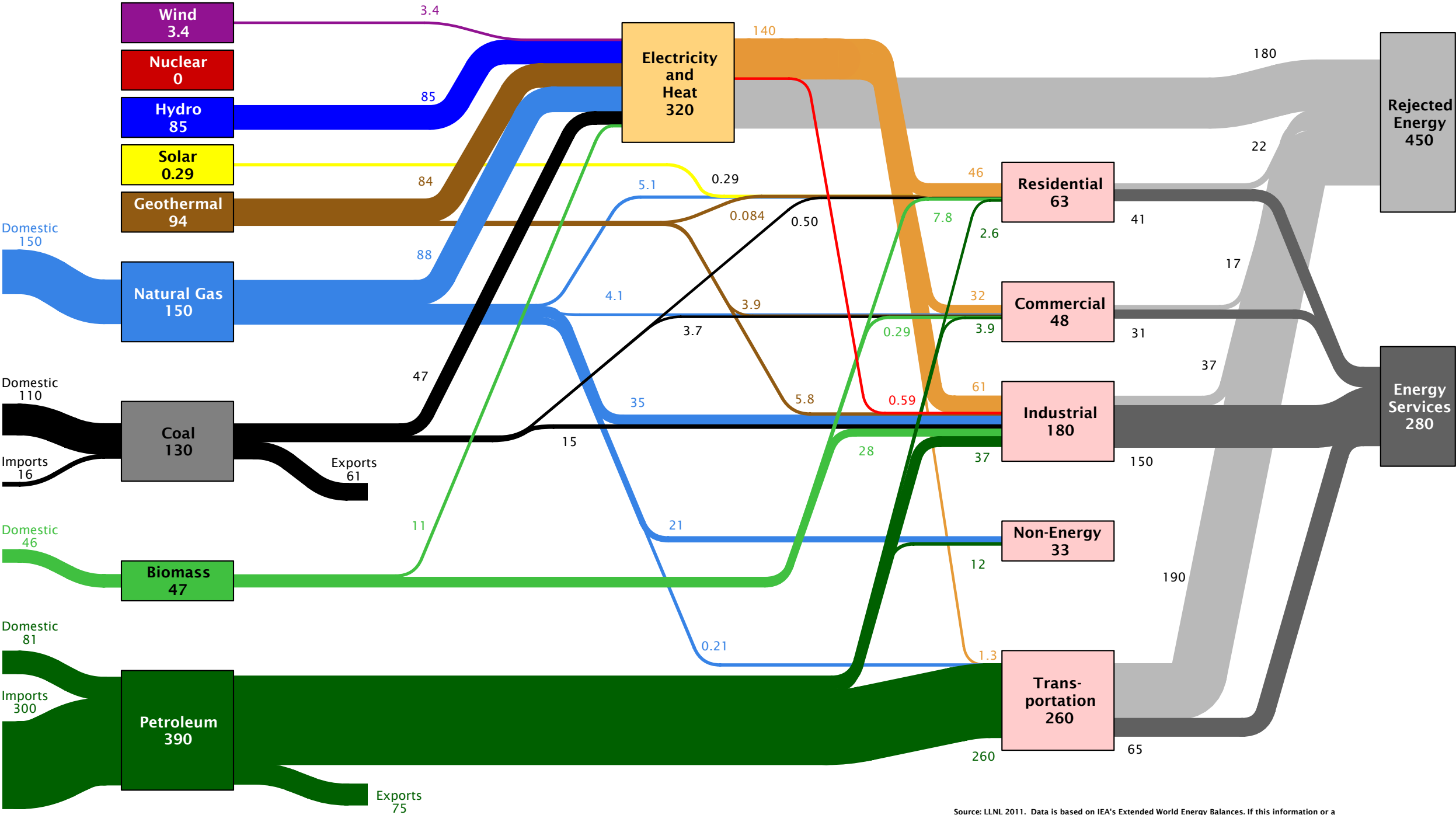
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Norway Energy Flow  
in 2007: ~1200 PJ



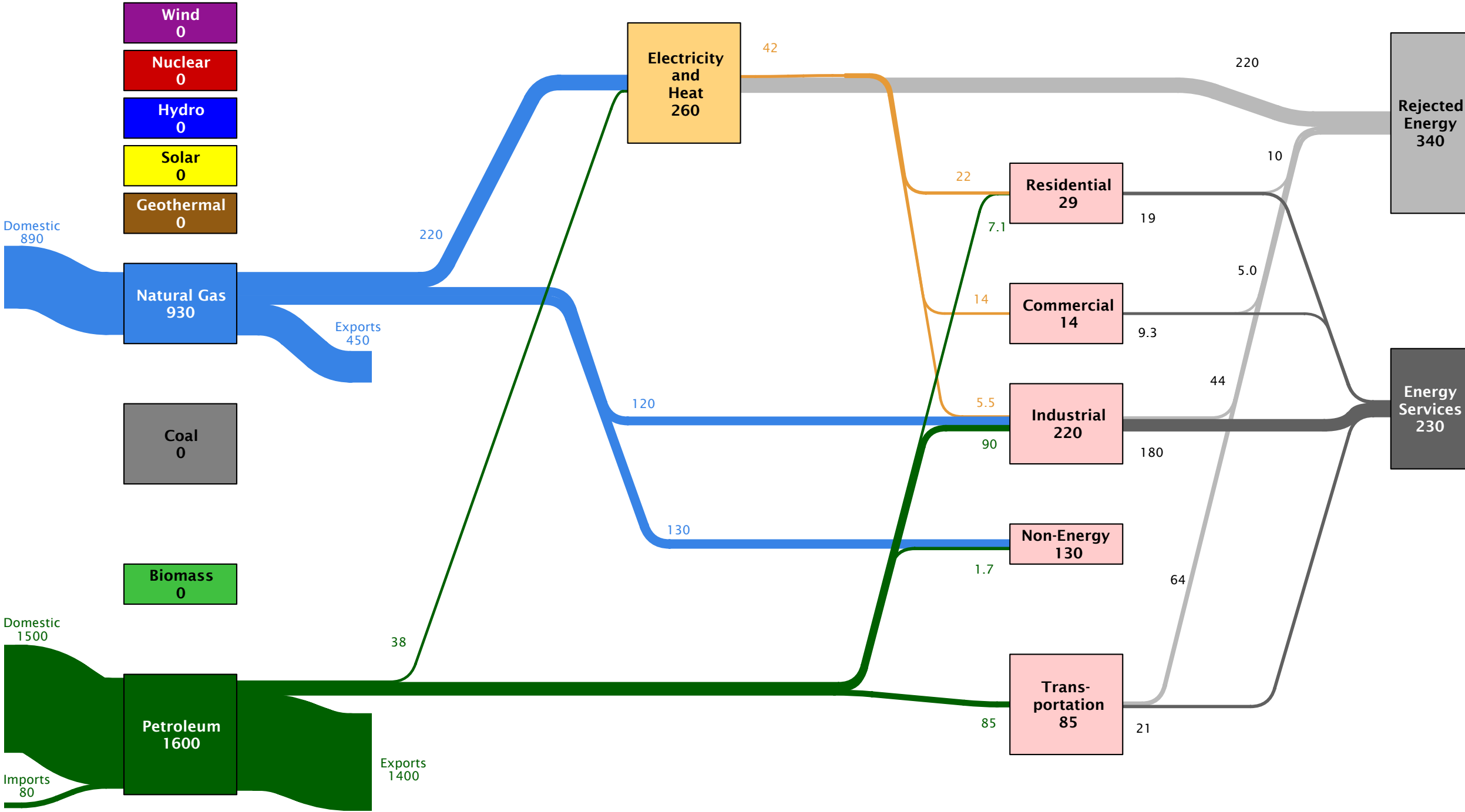
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

New Zealand Energy Flow  
in 2007: ~760 PJ



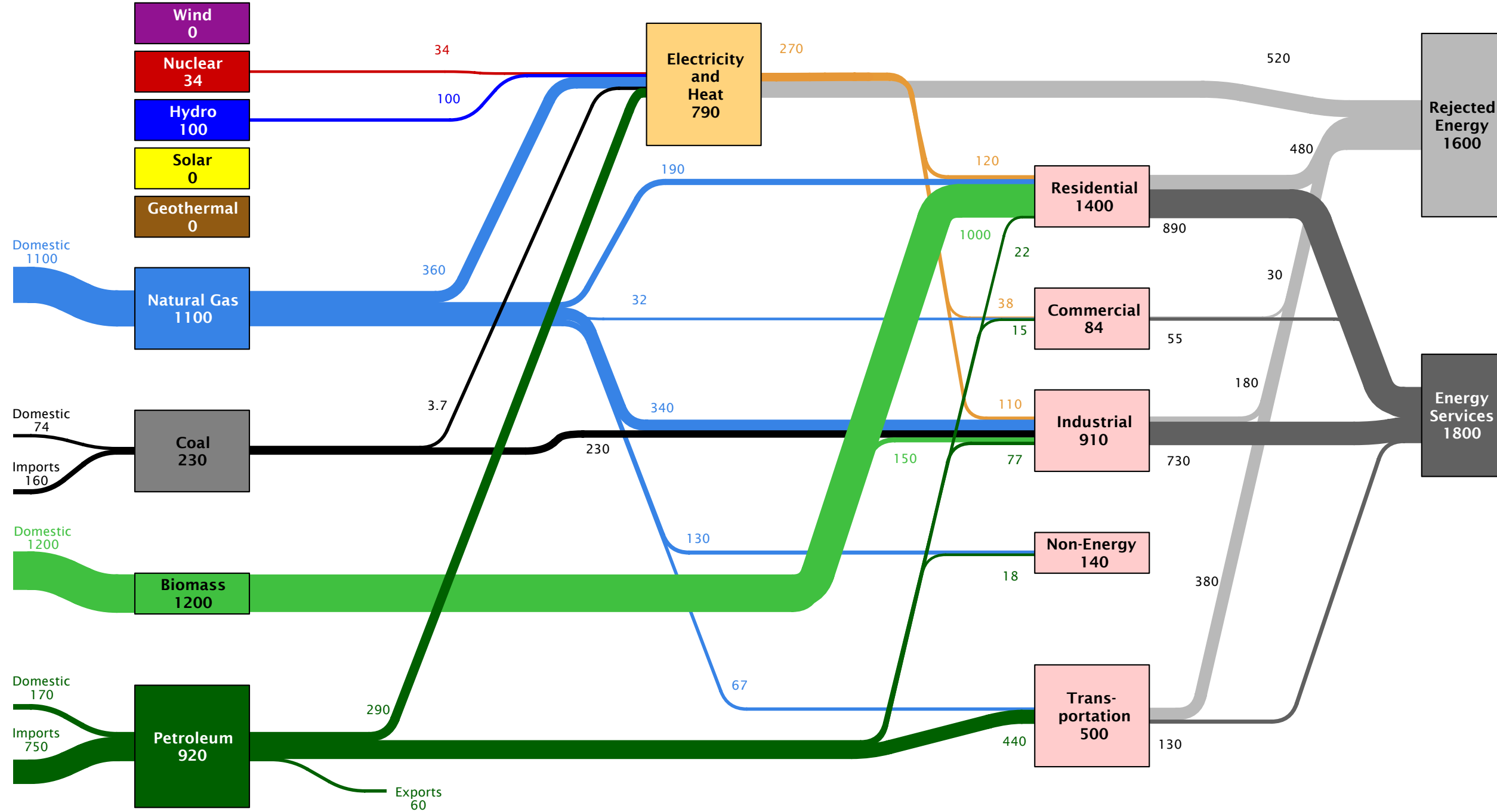
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Oman Energy Flow  
in 2007: ~700 PJ



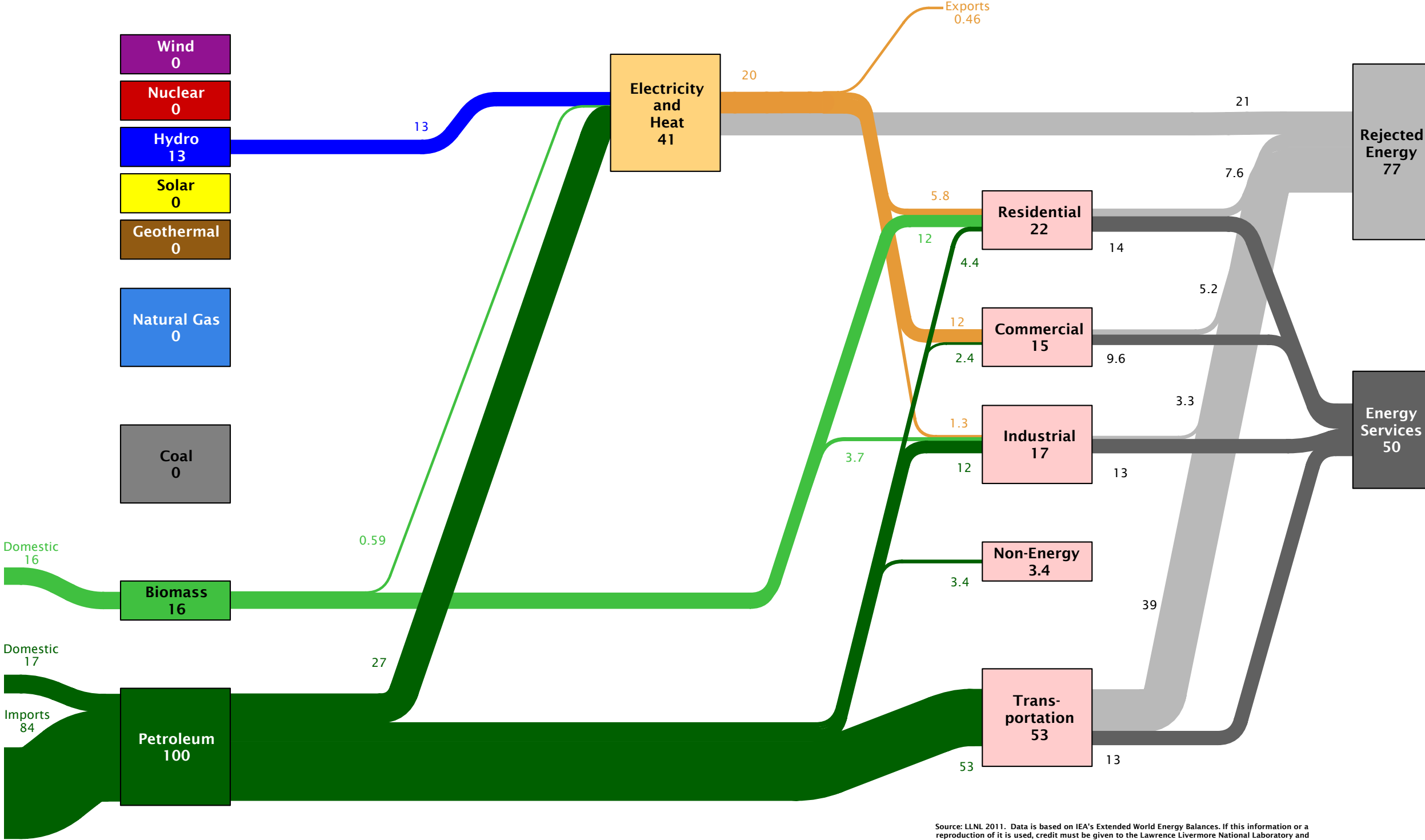
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Pakistan Energy Flow  
in 2007: ~3500 PJ



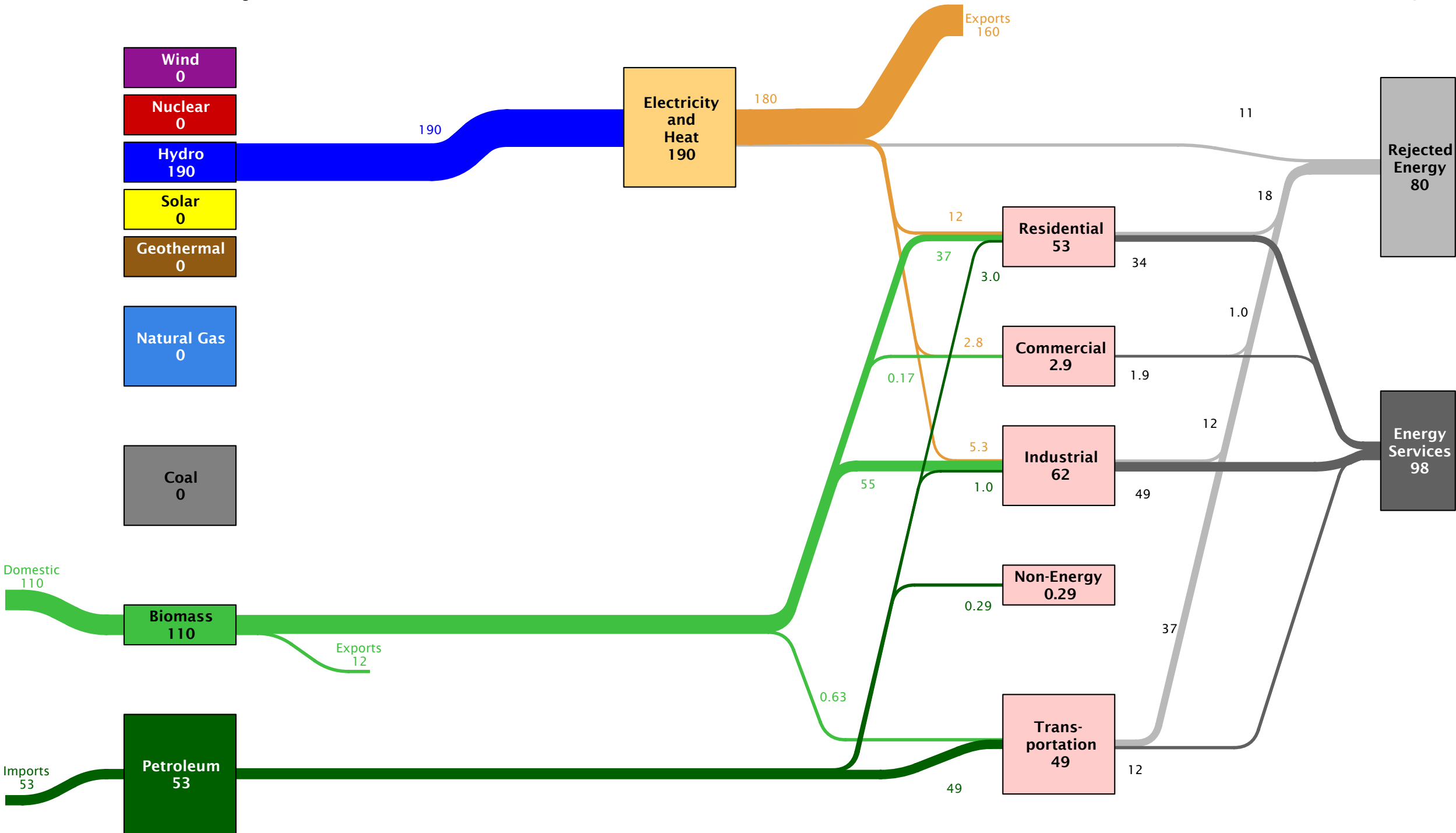
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Panama Energy Flow  
in 2007: ~130 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

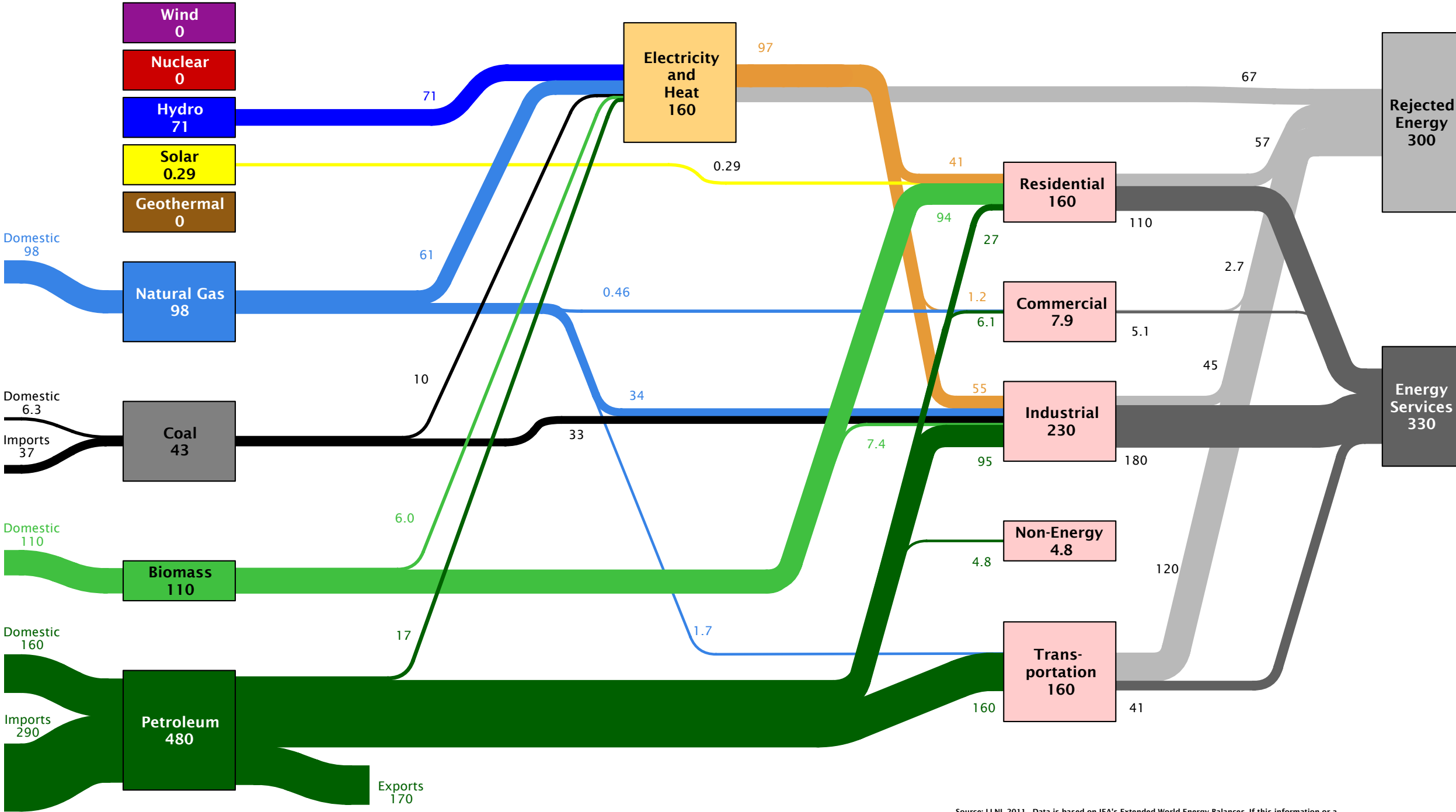
Paraguay Energy Flow  
in 2007: ~180 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

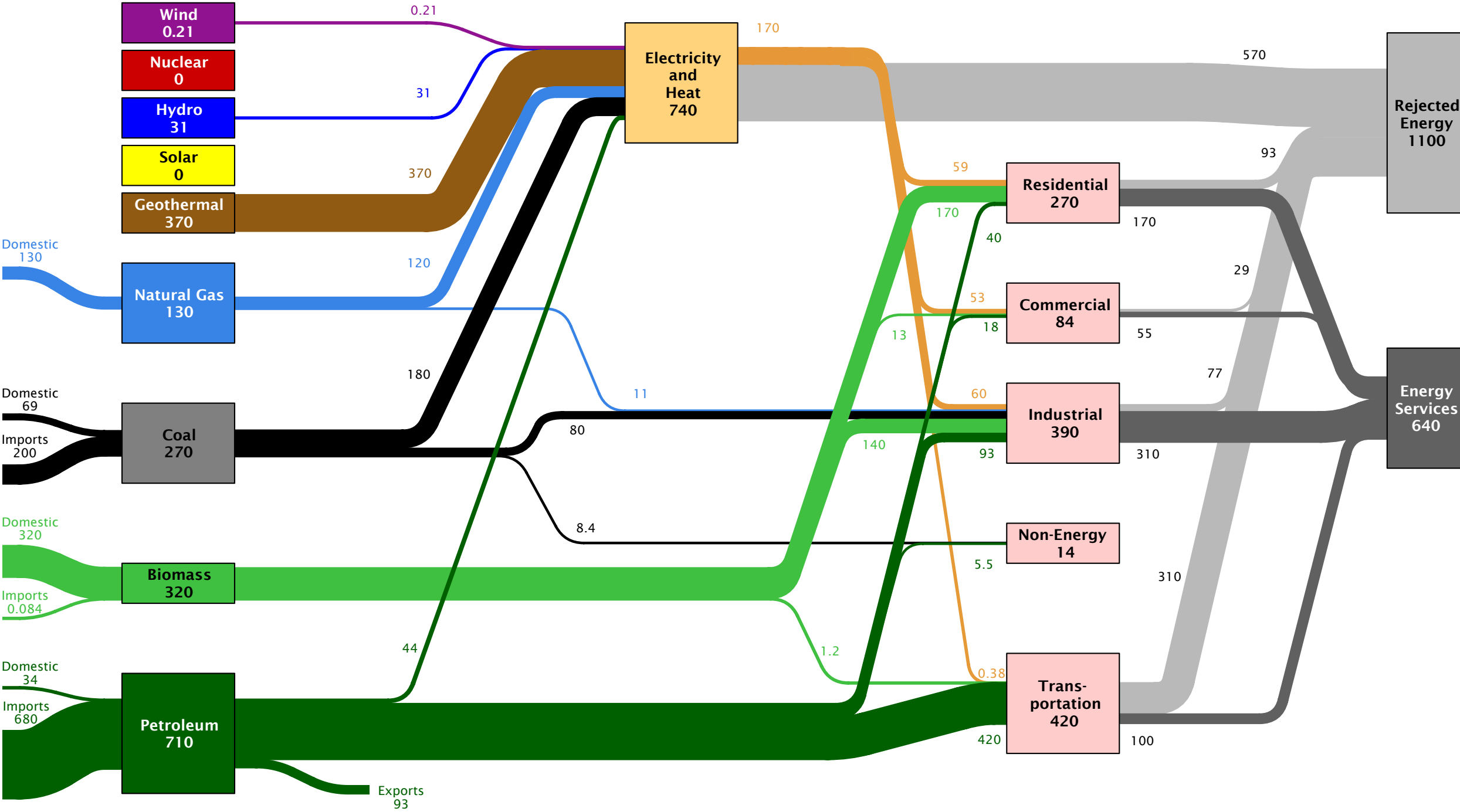


Peru Energy Flow  
in 2007: ~630 PJ



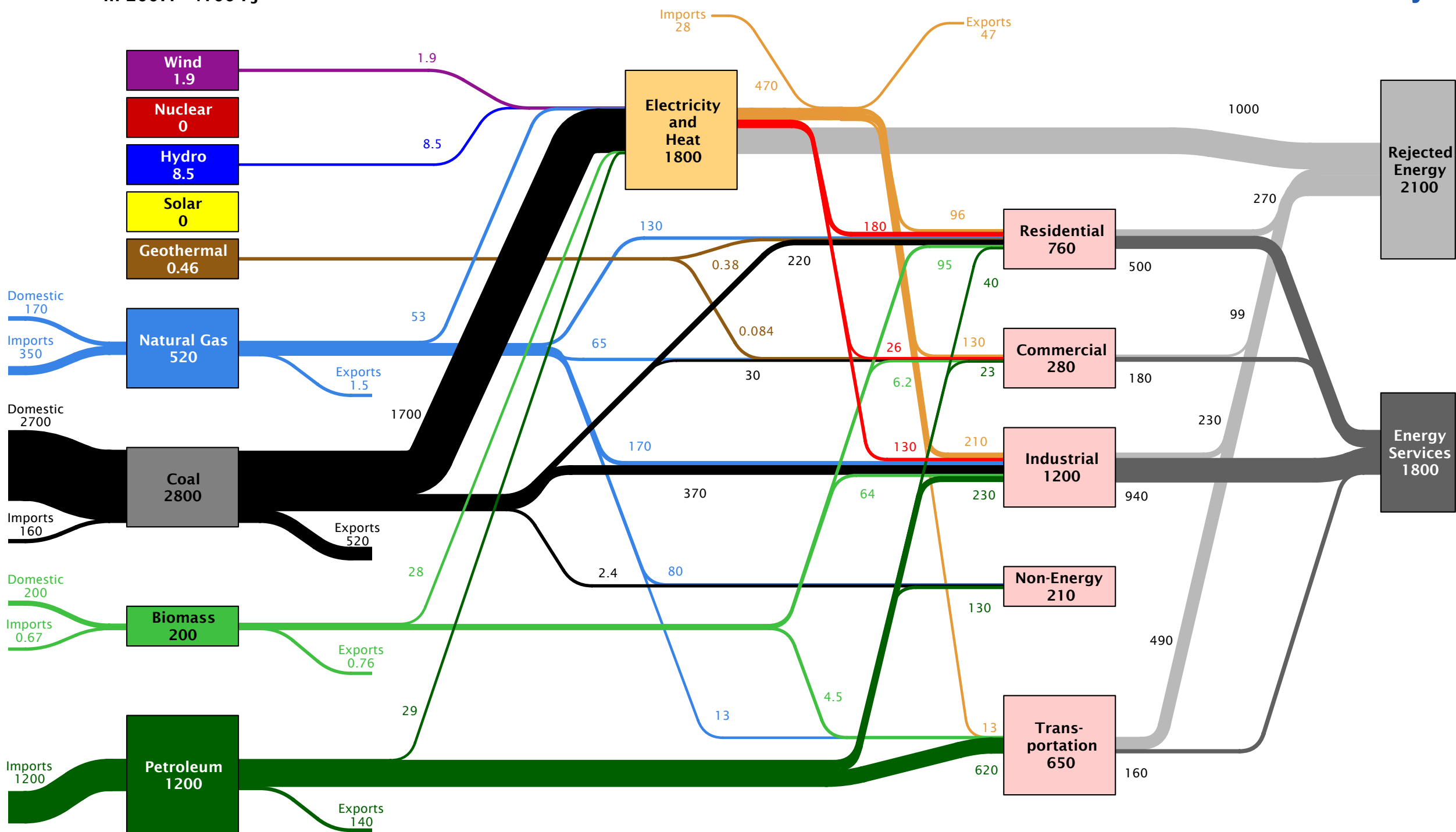
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Philippines Energy Flow  
in 2007: ~1700 PJ



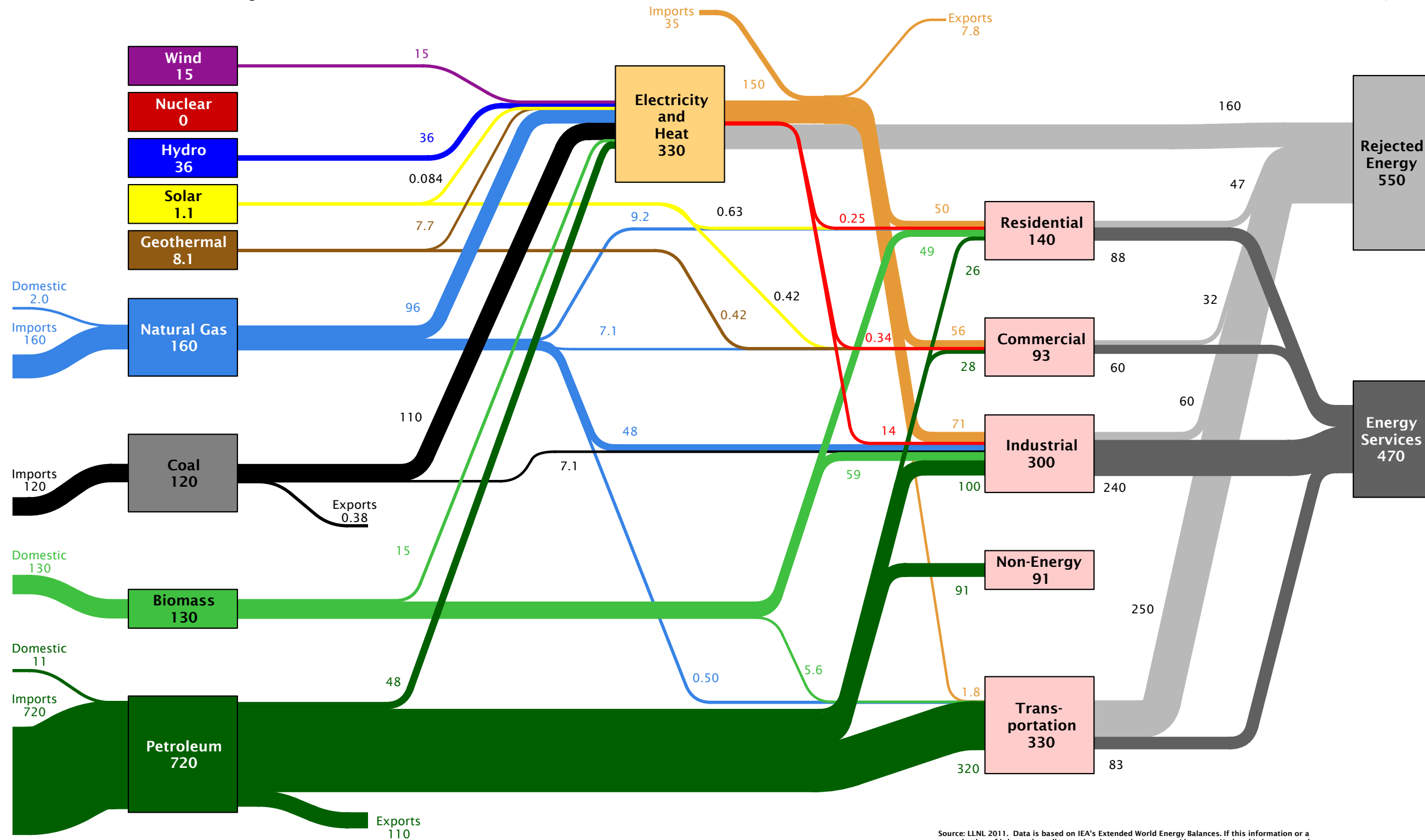
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Poland Energy Flow in 2007: ~4100 PJ



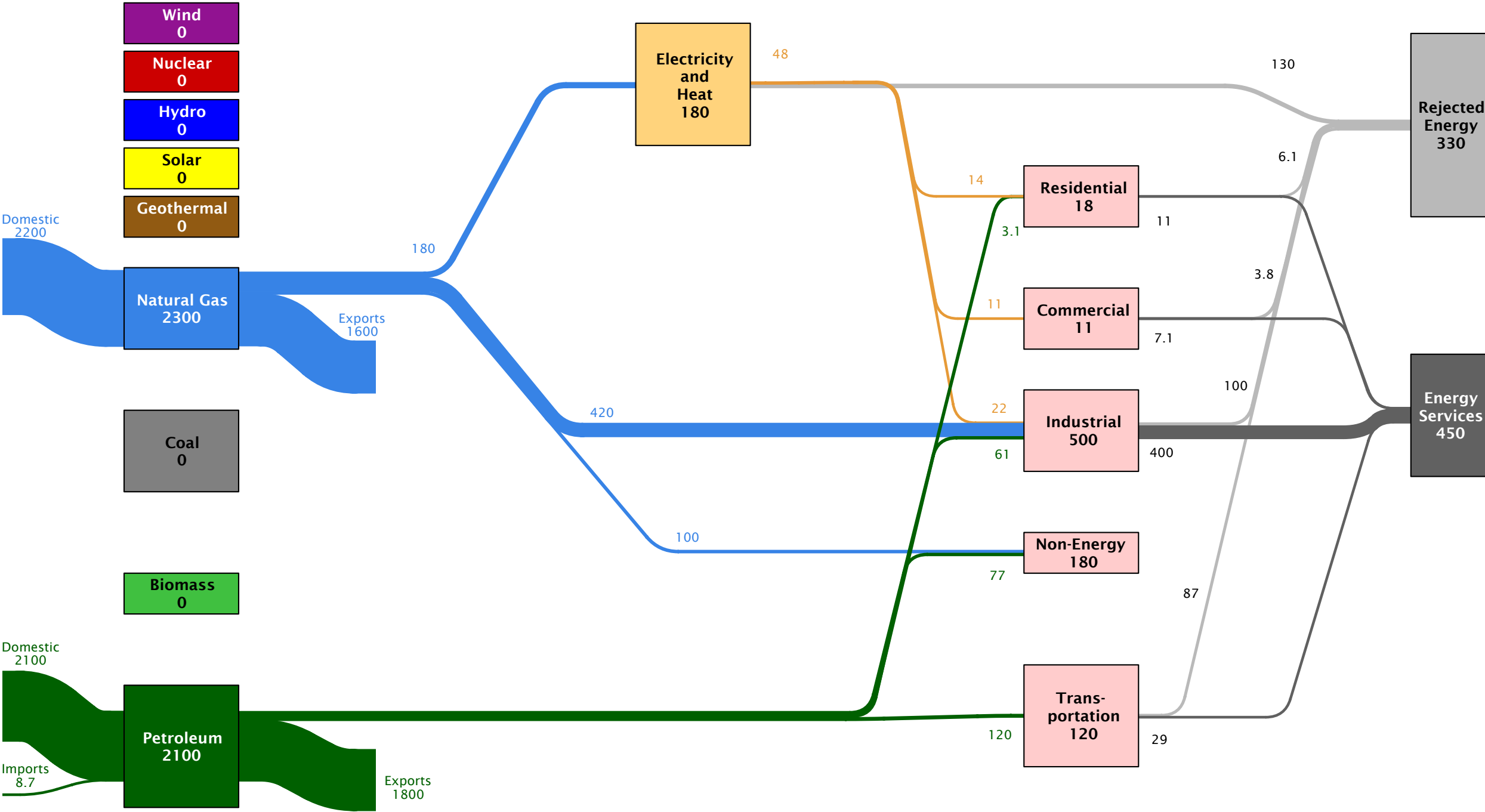
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Portugal Energy Flow  
in 2007: ~1100 PJ



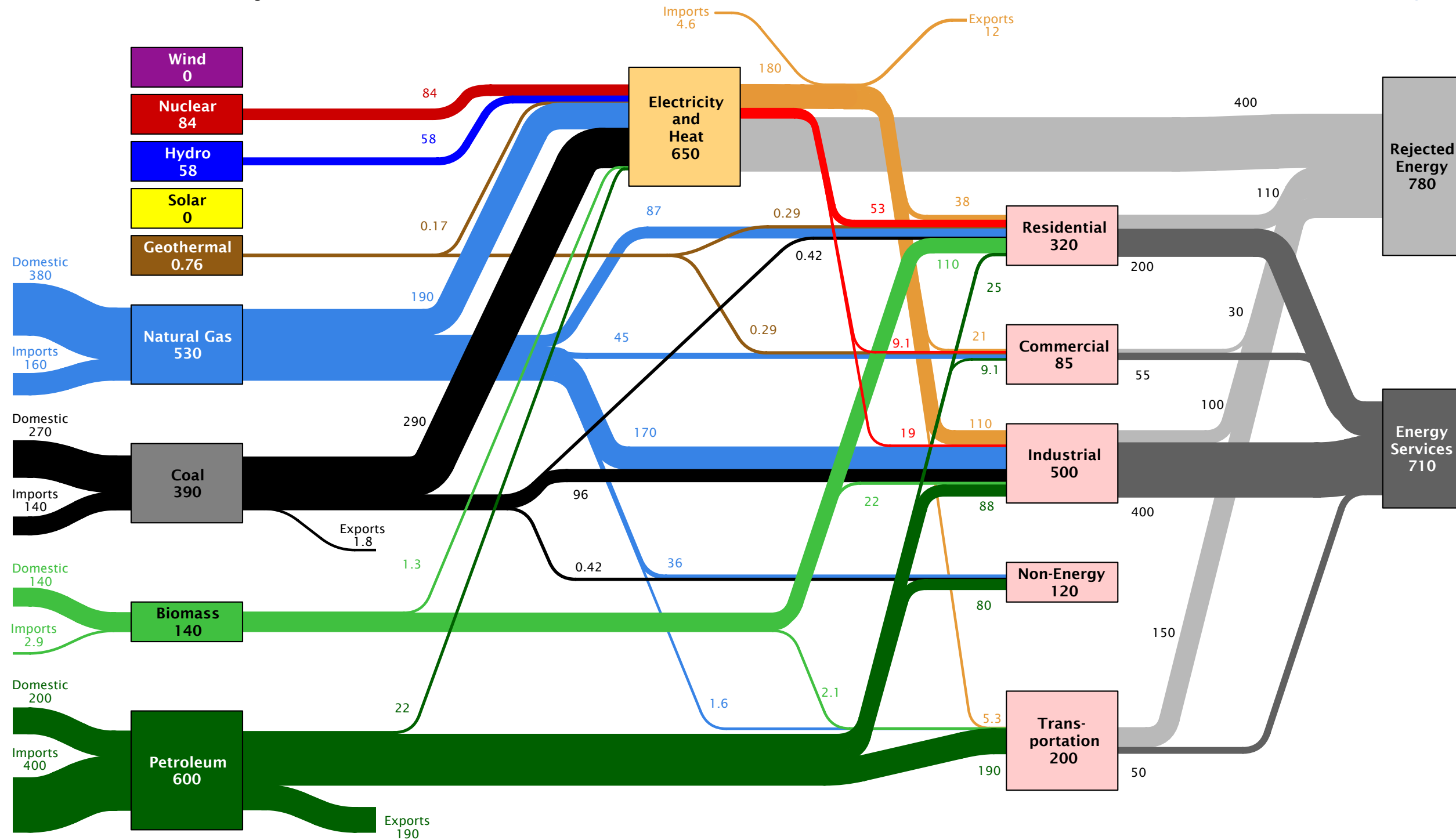
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Qatar Energy Flow  
in 2007: ~960 PJ



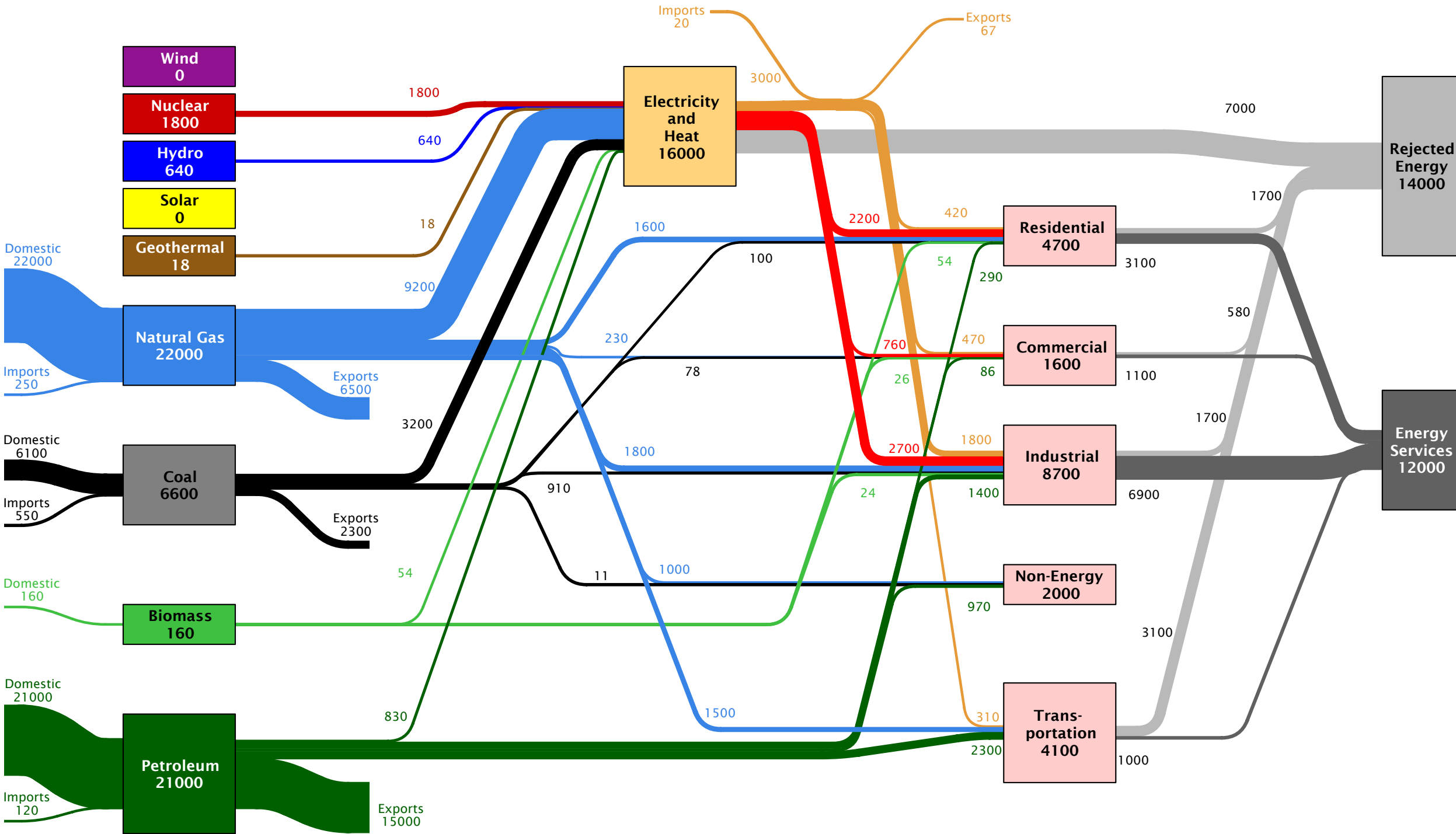
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Romania Energy Flow  
in 2007: ~1600 PJ



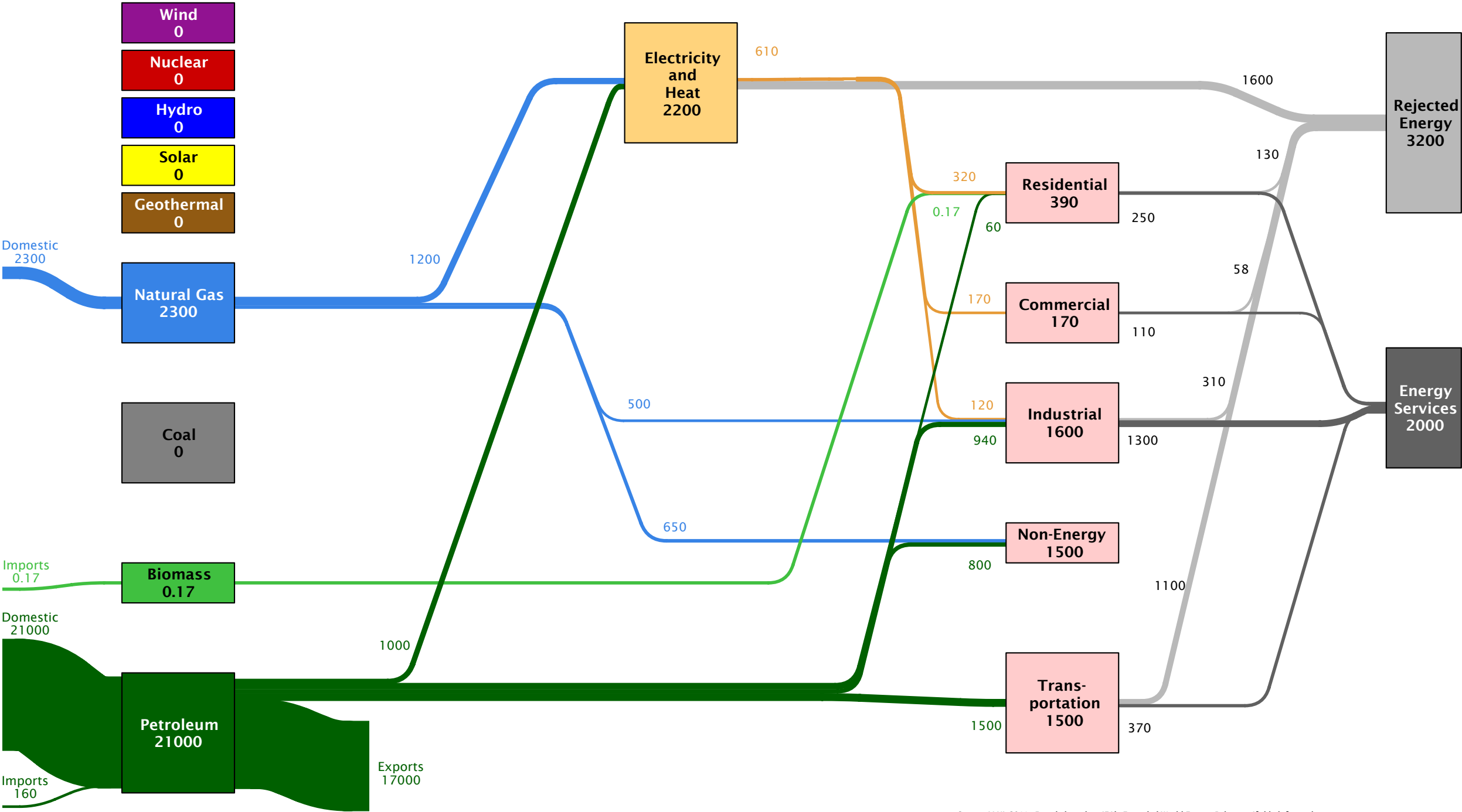
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Russian Federation Energy Flow  
in 2007: ~28000 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

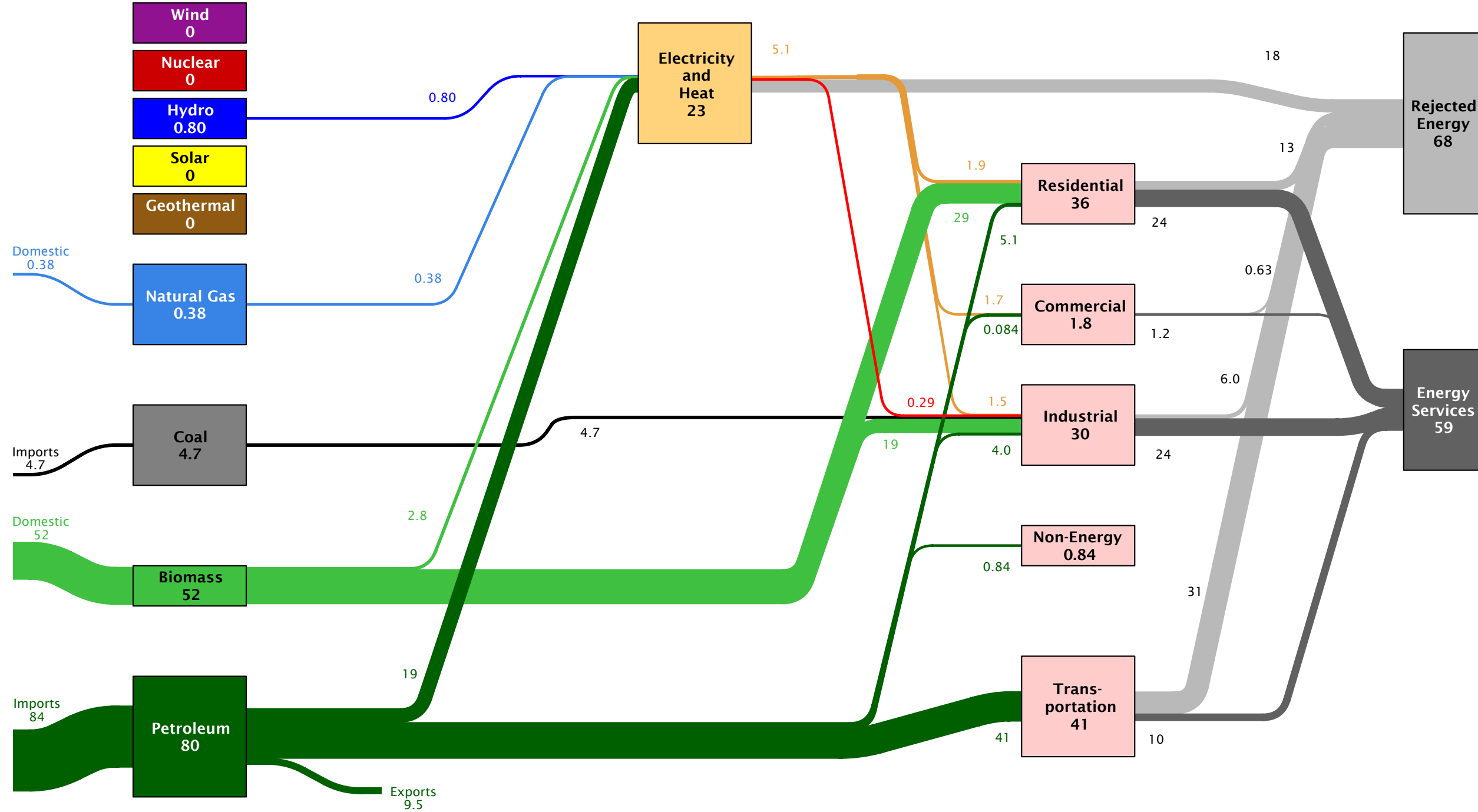
Saudi Arabia Energy Flow  
in 2007: ~6600 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

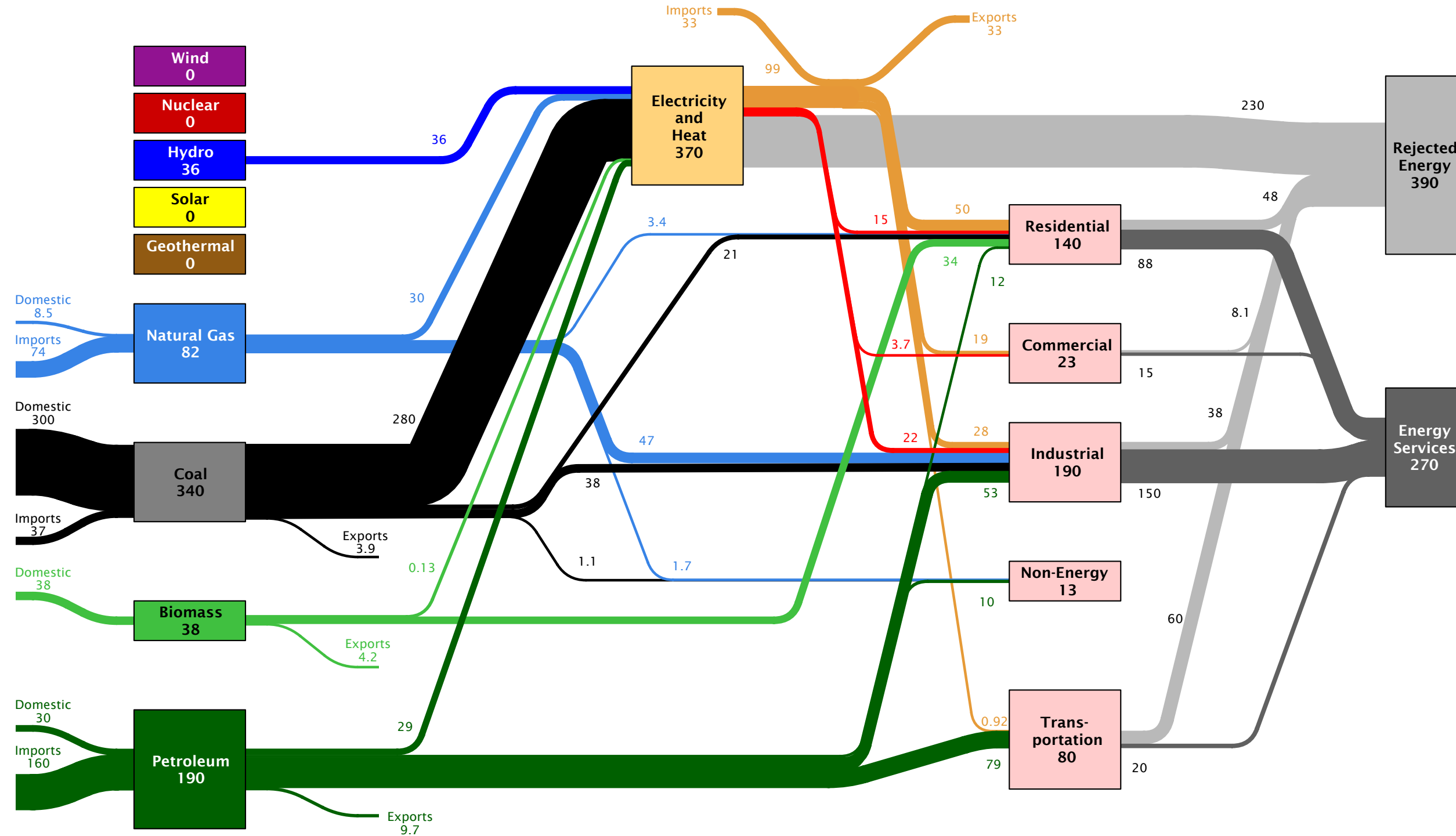


Senegal Energy Flow  
in 2007: ~130 PJ



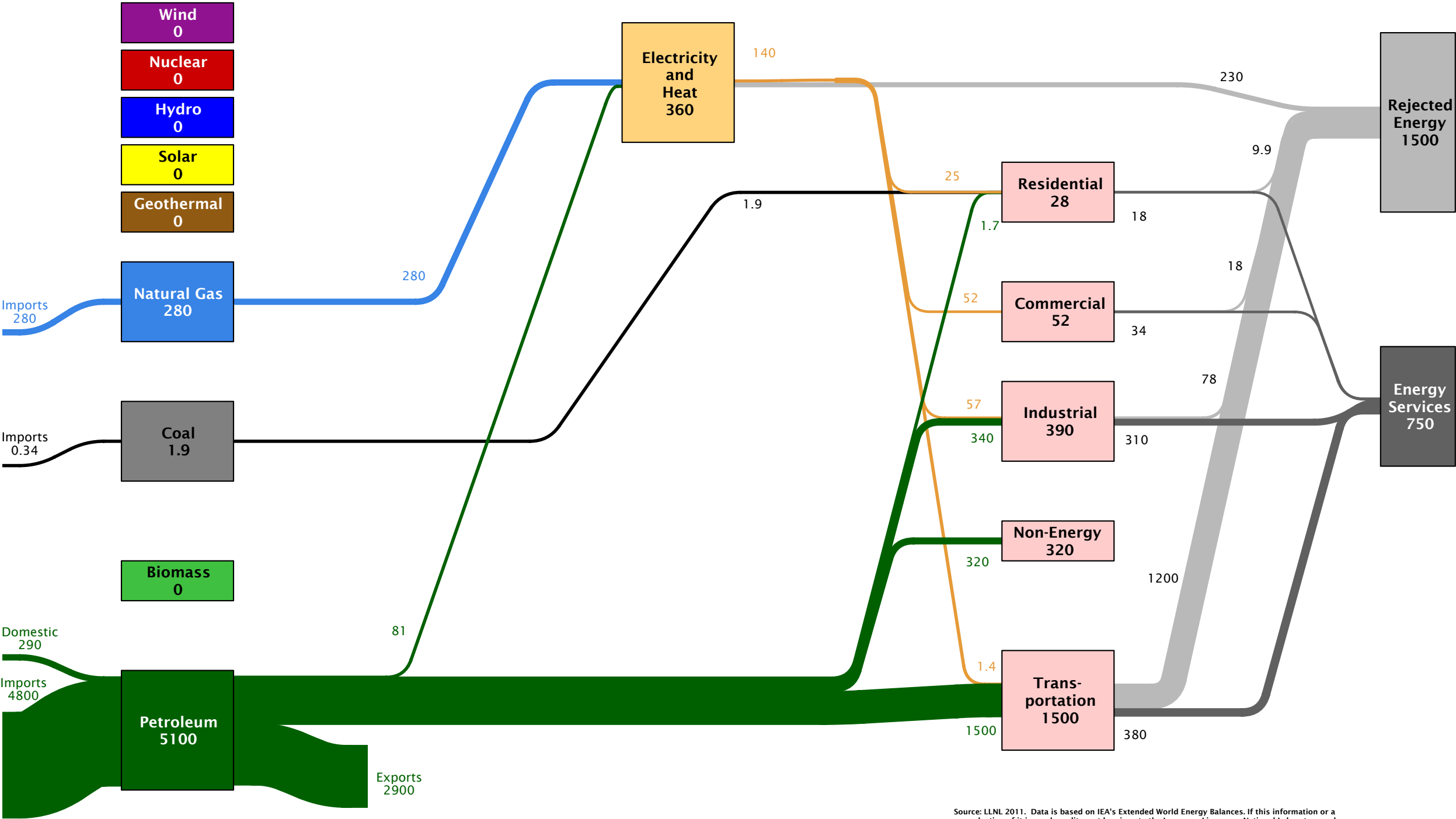
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Serbia Energy Flow  
in 2007: ~680 PJ



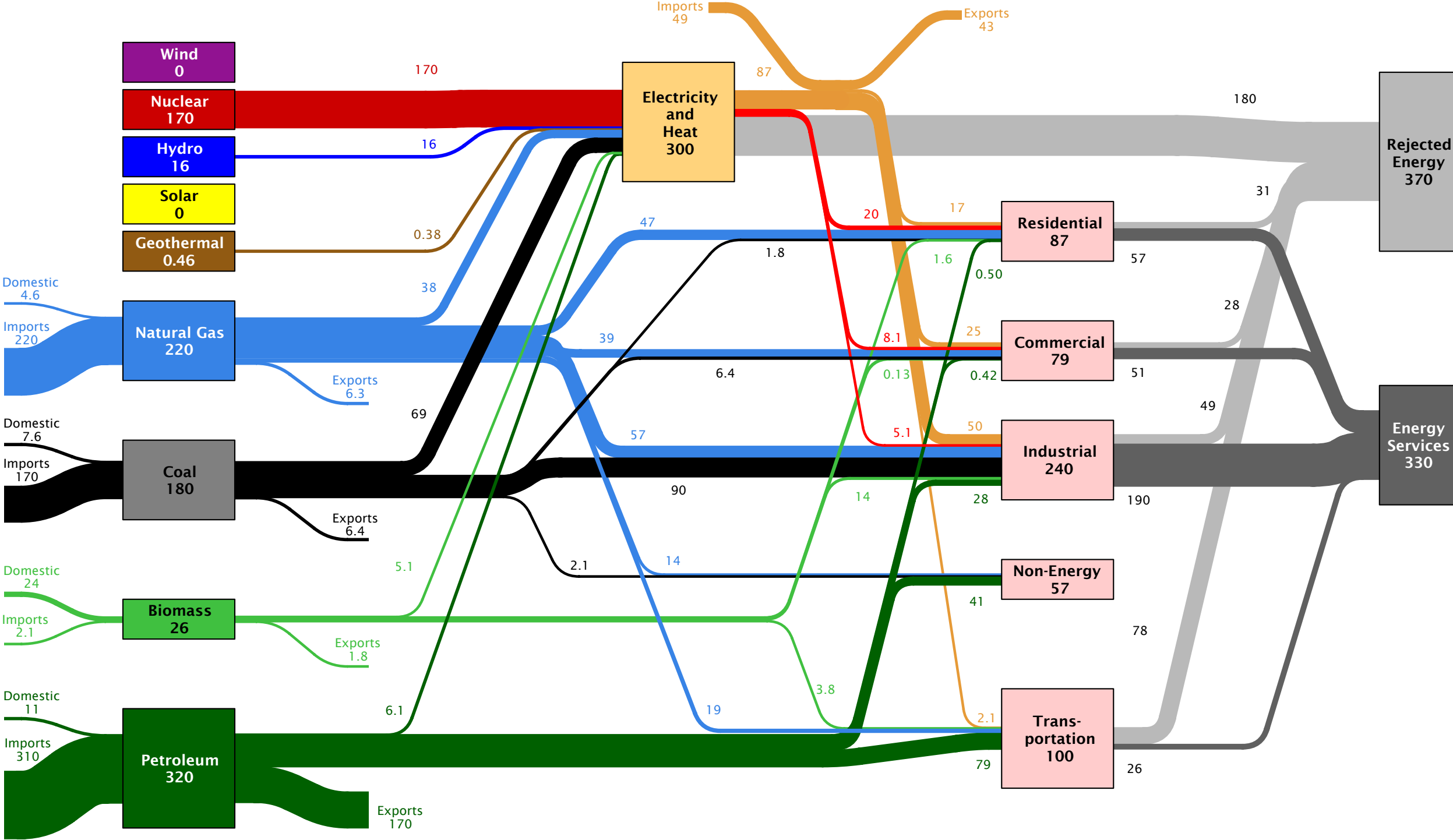
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Singapore Energy Flow  
in 2007: ~2600 PJ



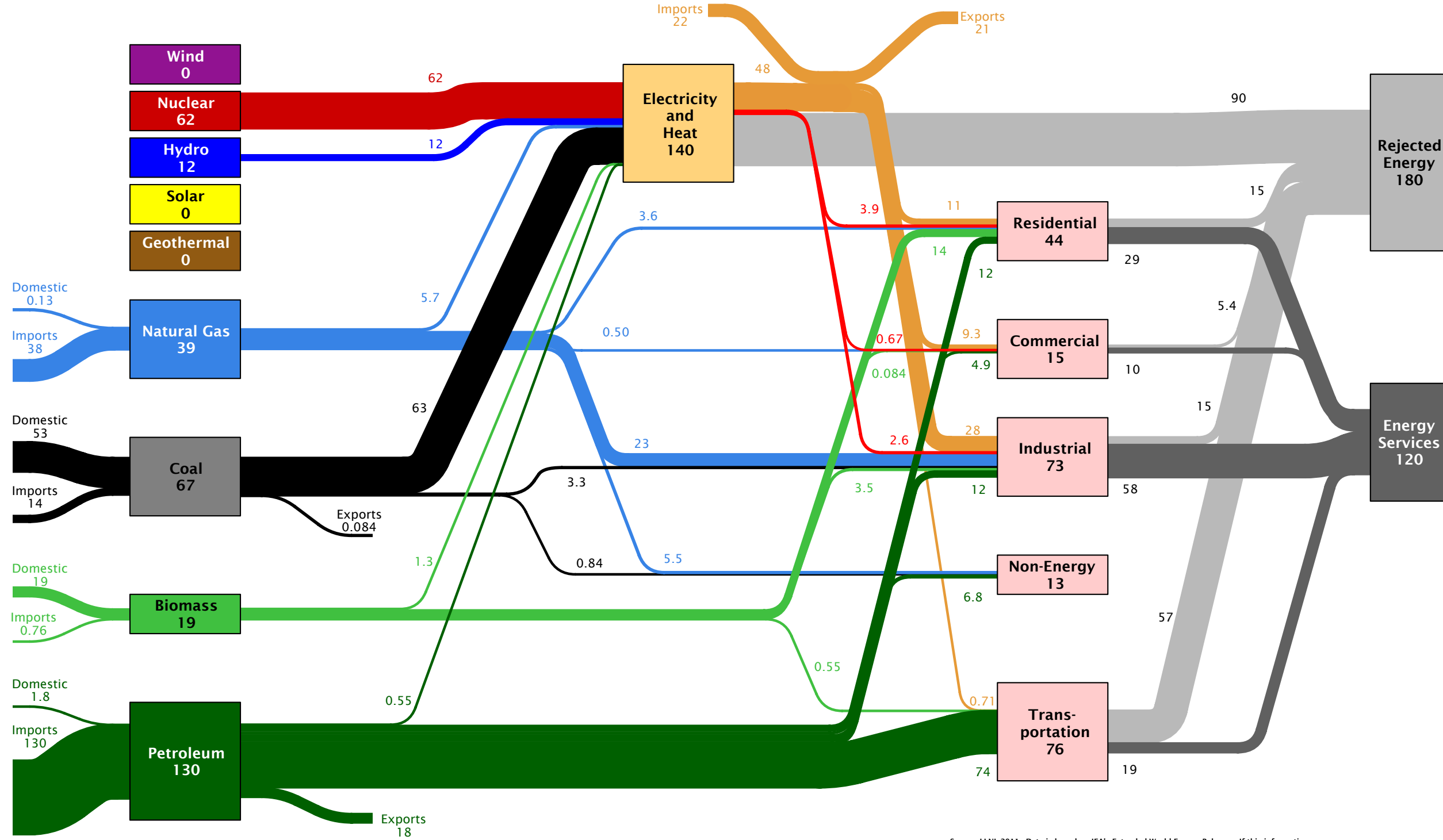
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Slovak Republic Energy Flow  
in 2007: ~750 PJ



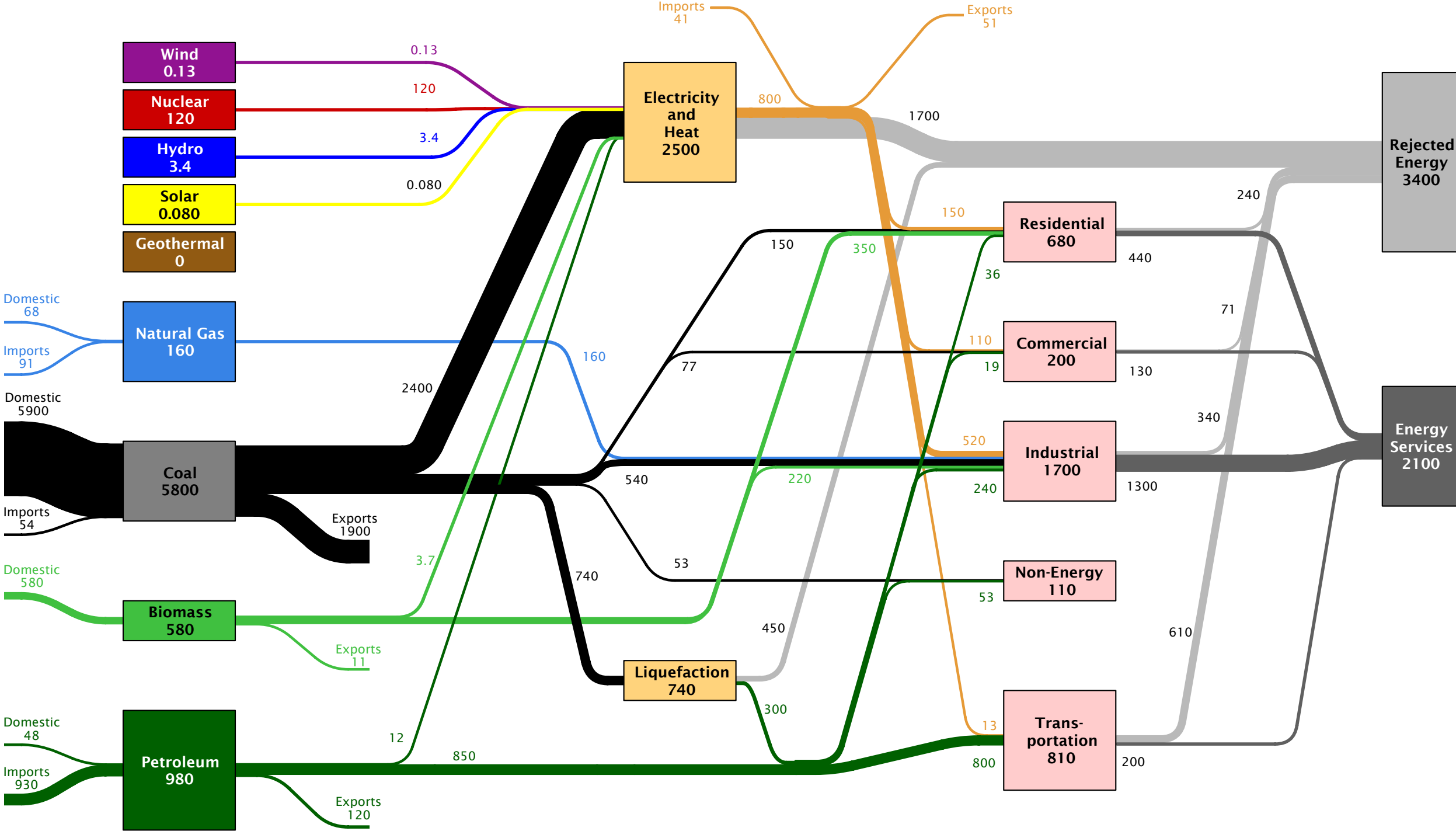
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Slovenia Energy Flow  
in 2007: ~310 PJ



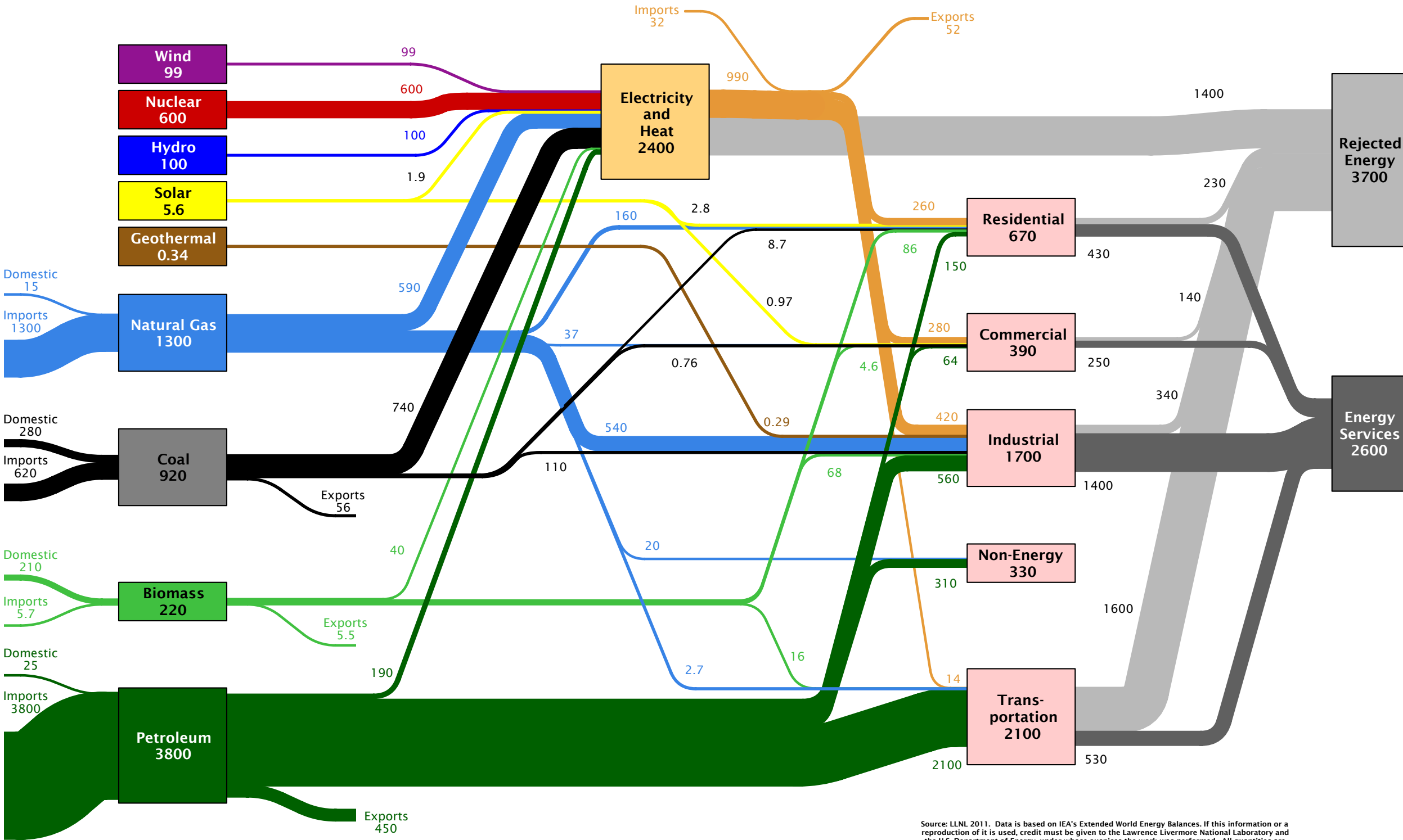
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

South Africa Energy Flow  
in 2007: ~5600 PJ



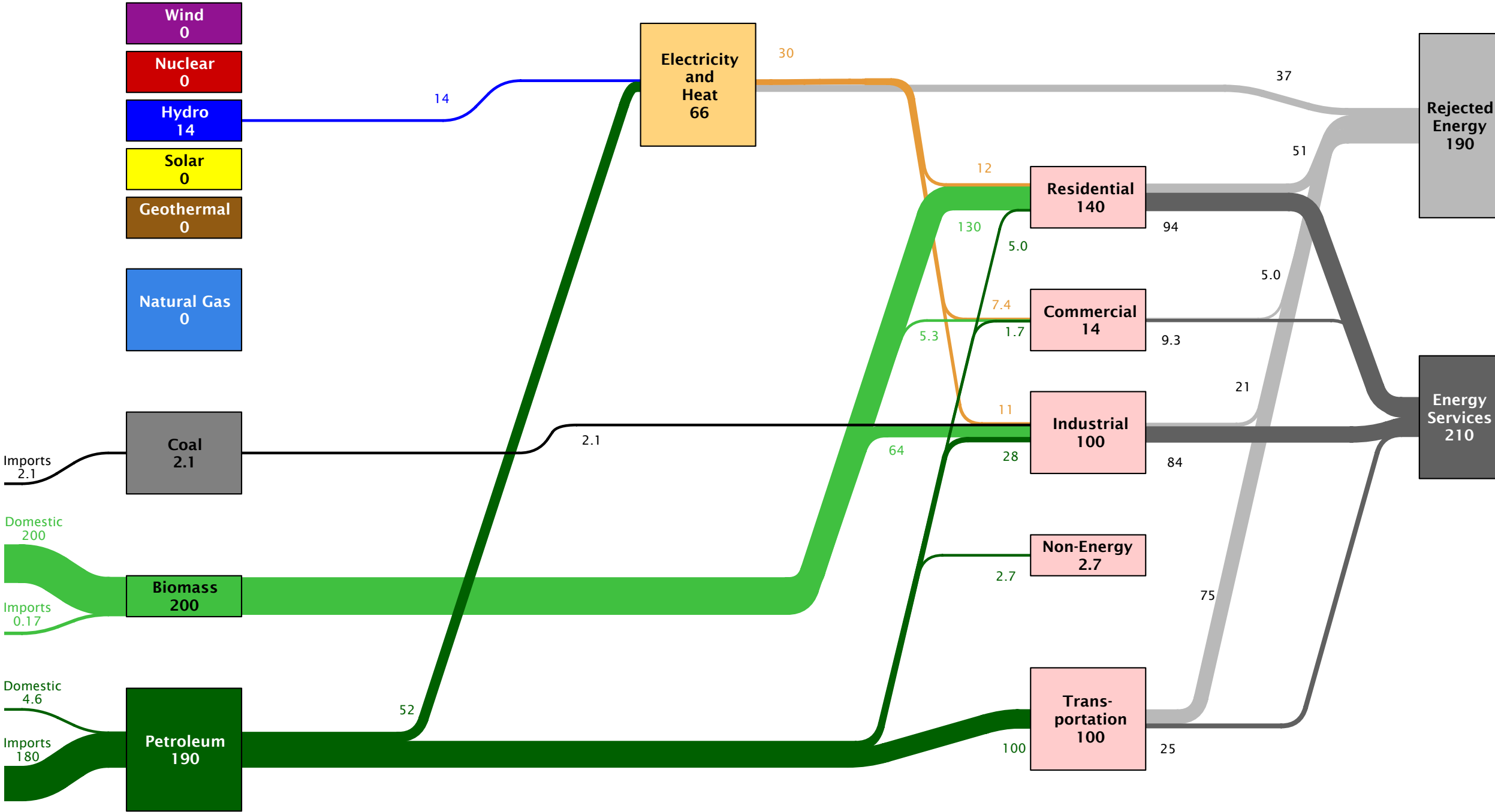
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Spain Energy Flow  
in 2007: ~6600 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

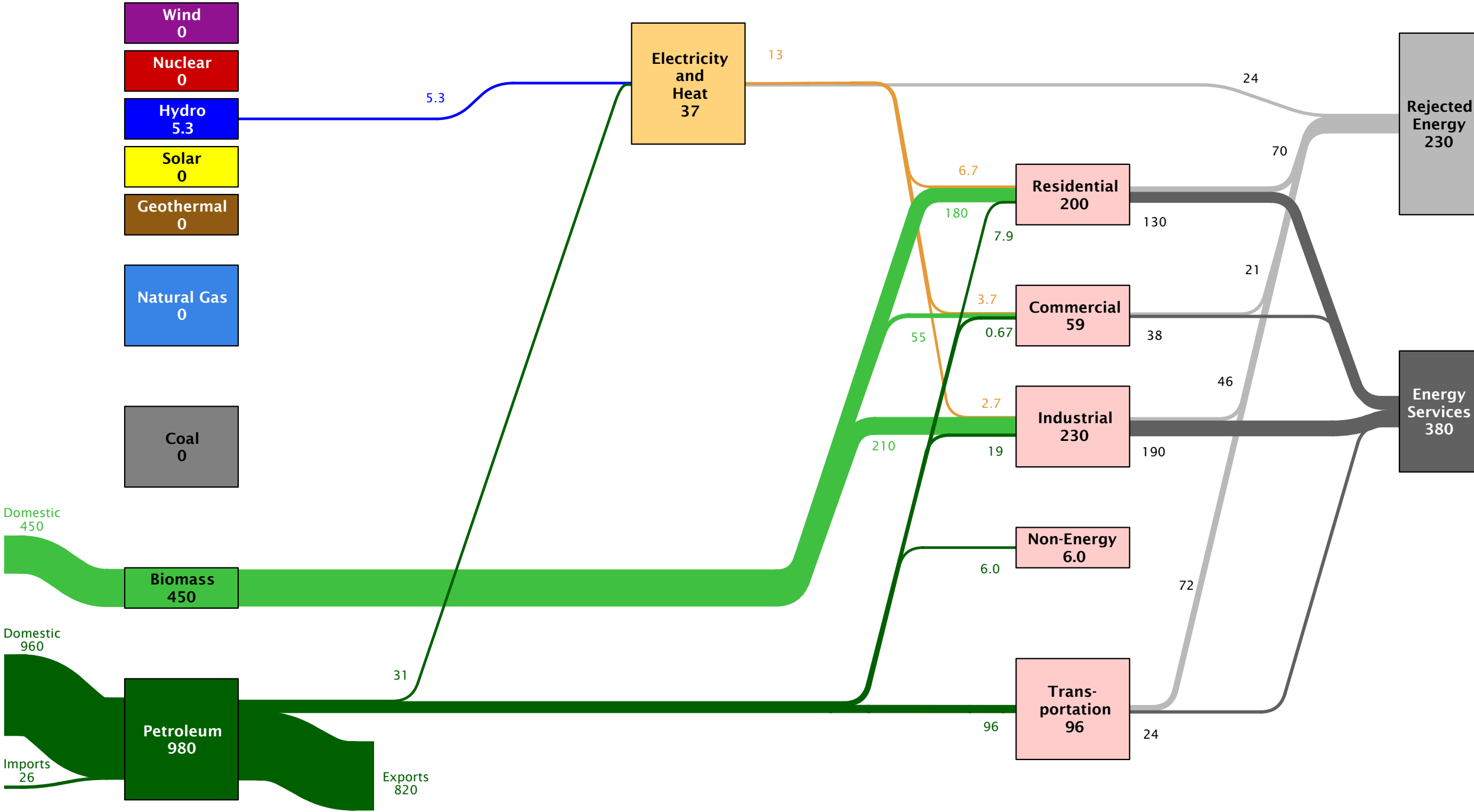
Sri Lanka Energy Flow  
in 2007: ~400 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

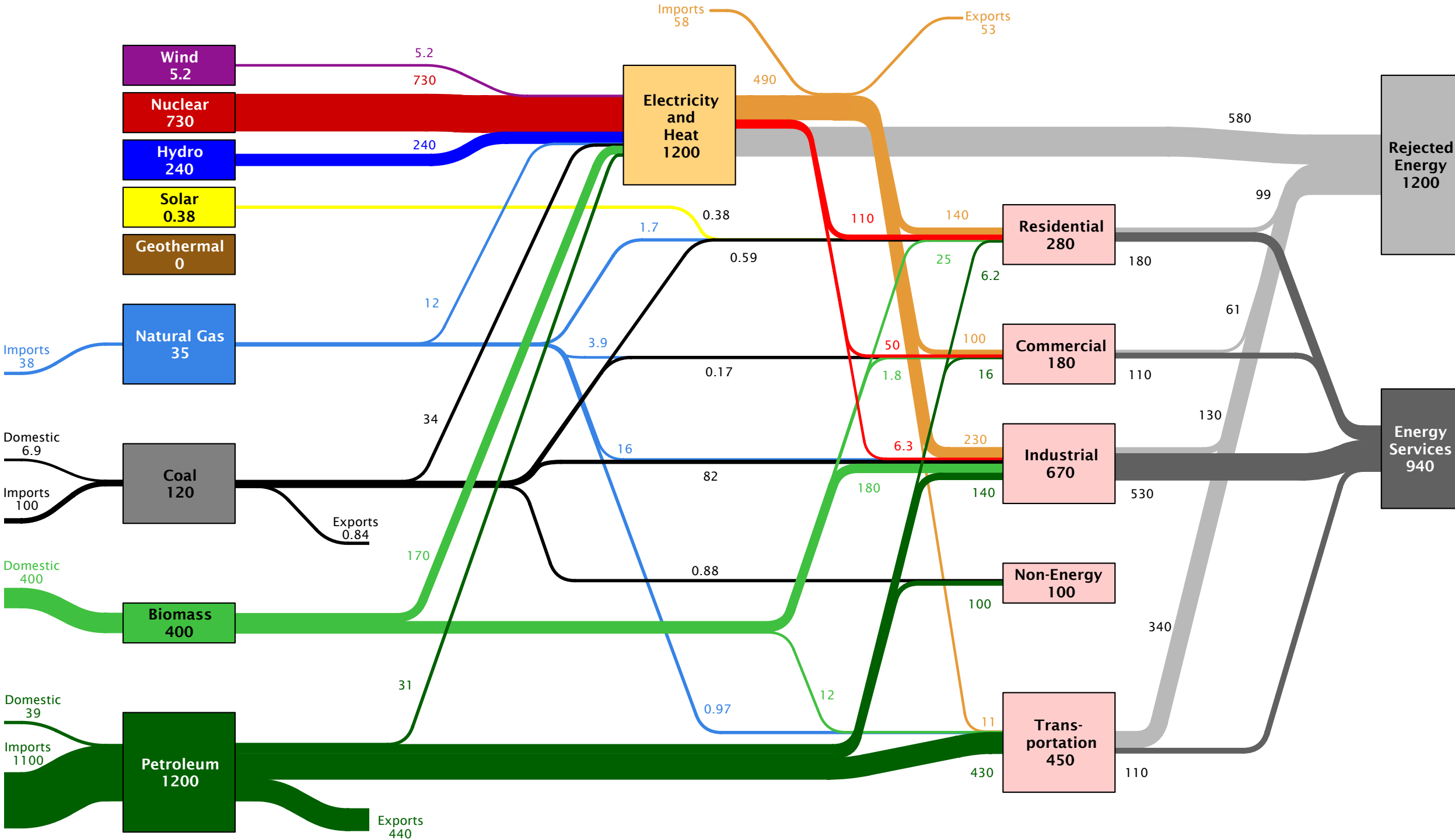


Sudan Energy Flow  
in 2007: ~620 PJ



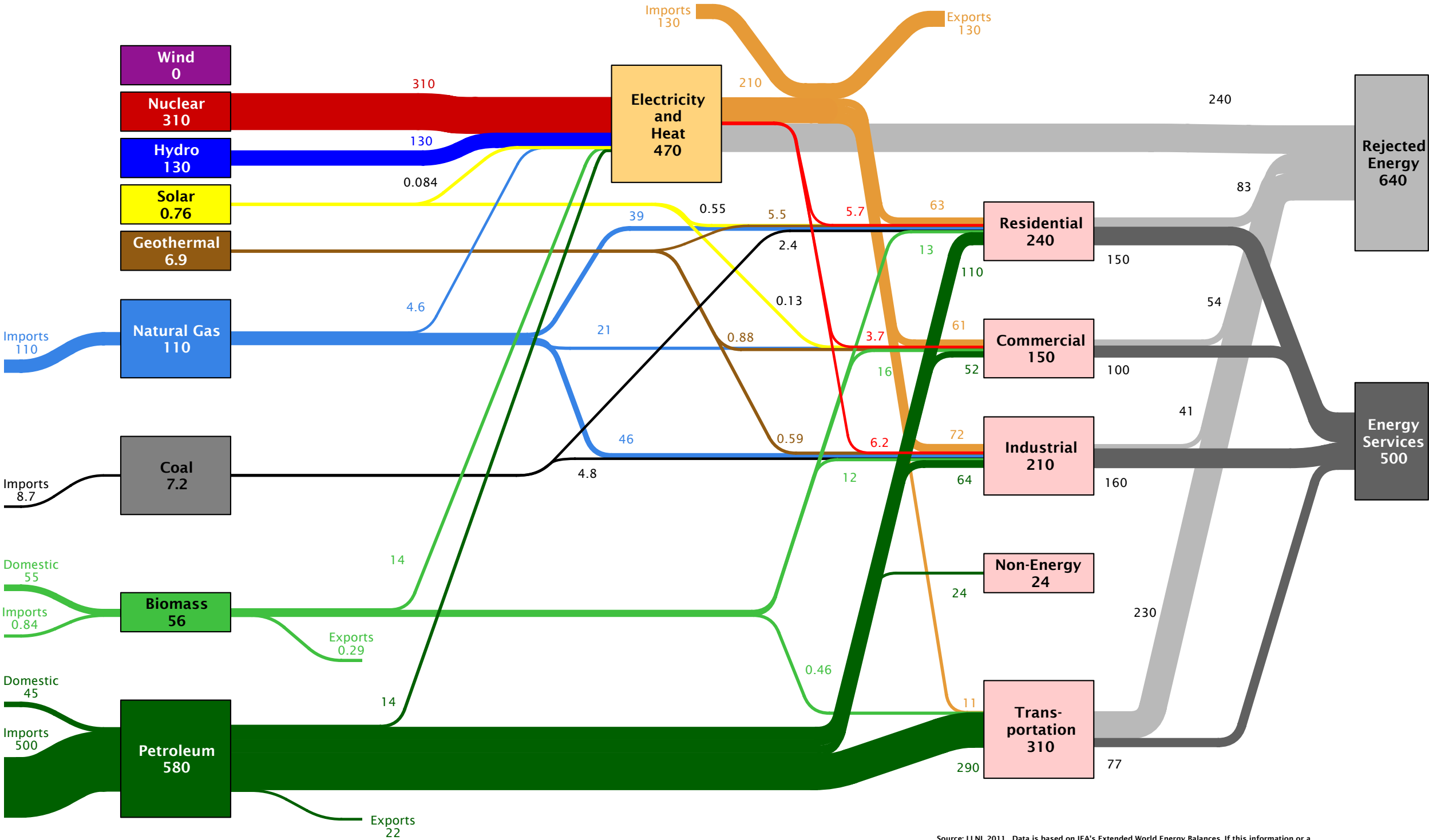
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Sweden Energy Flow  
in 2007: ~2300 PJ



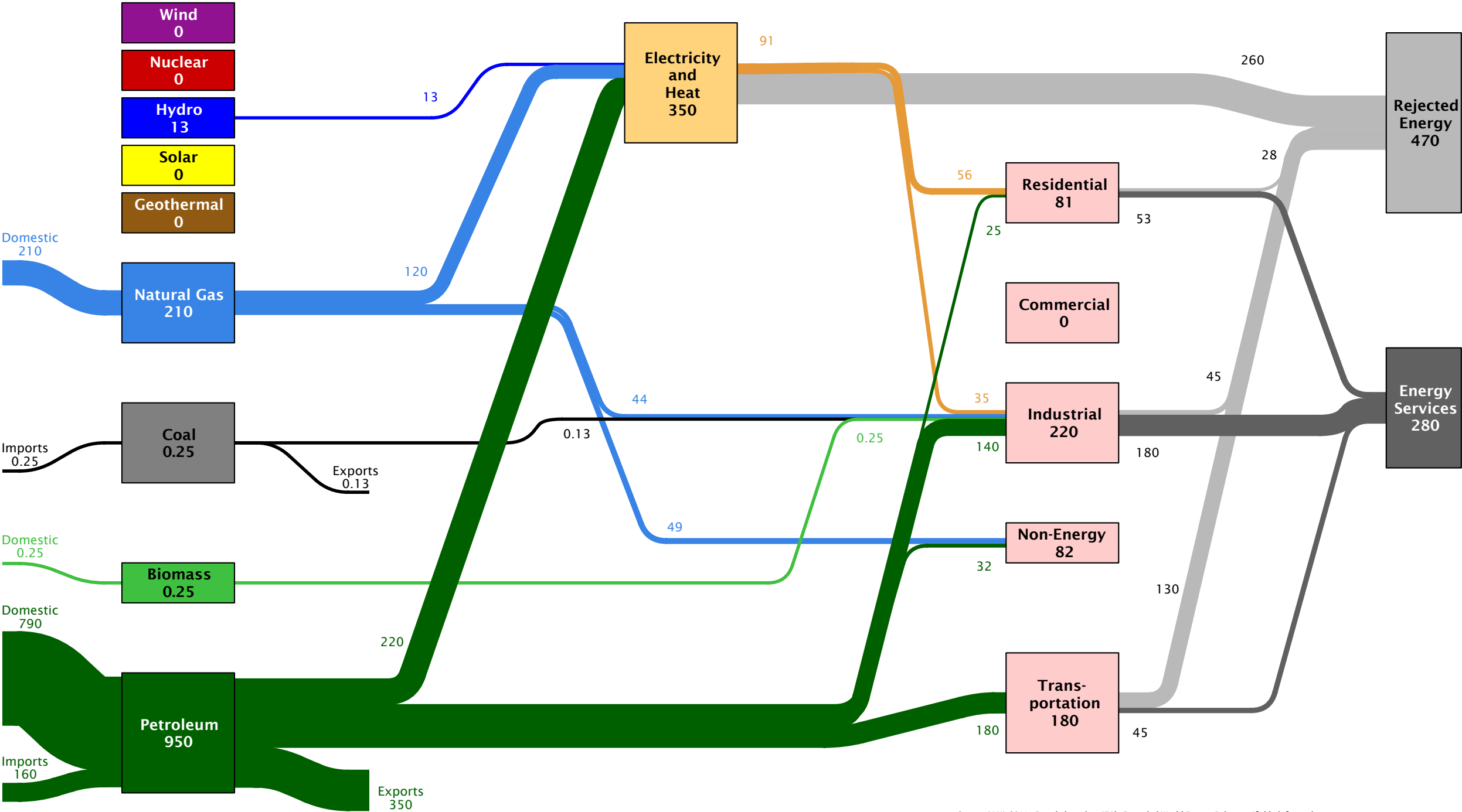
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Switzerland Energy Flow  
in 2007: ~1200 PJ



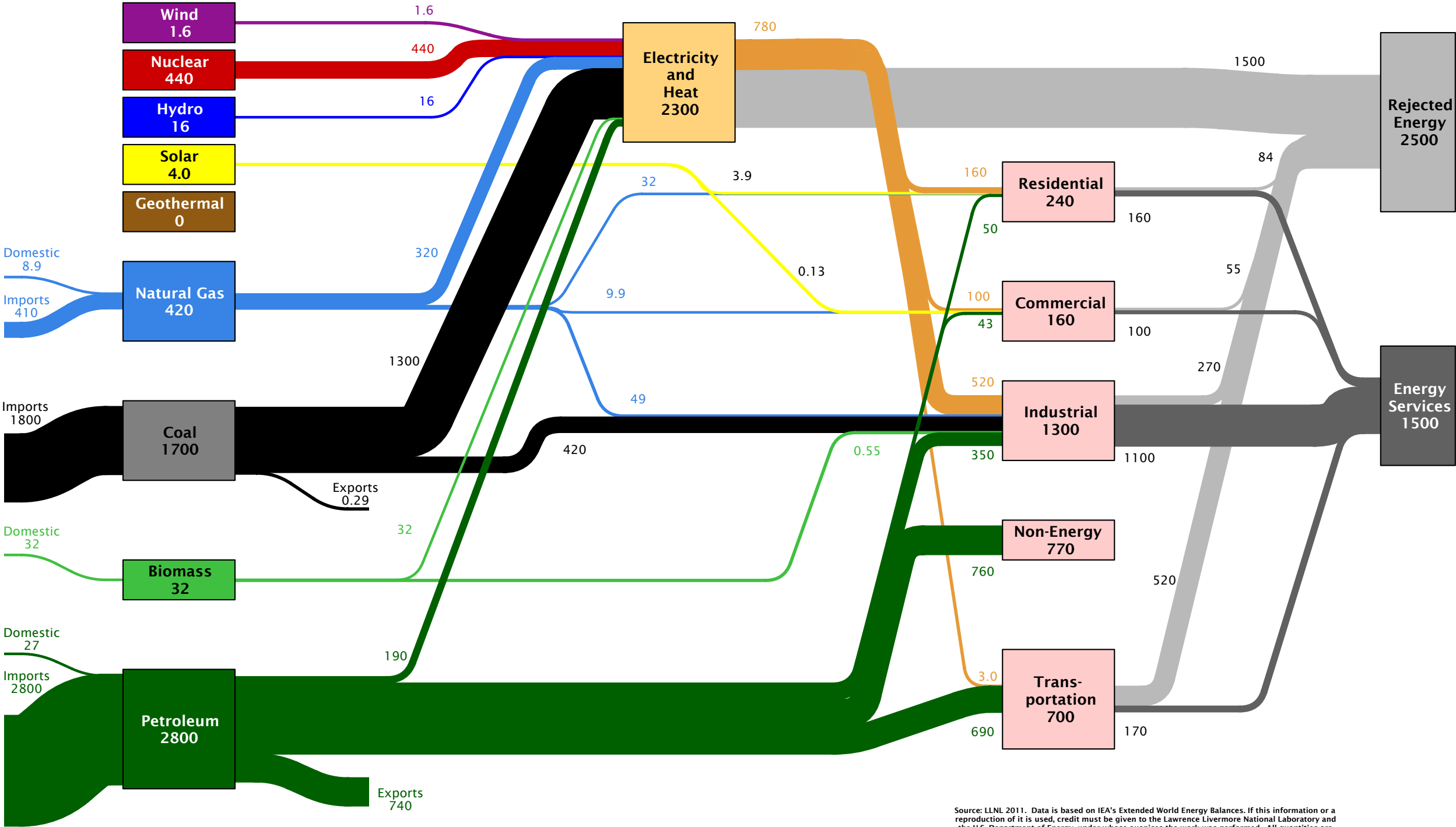
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Syria Energy Flow  
in 2007: ~830 PJ



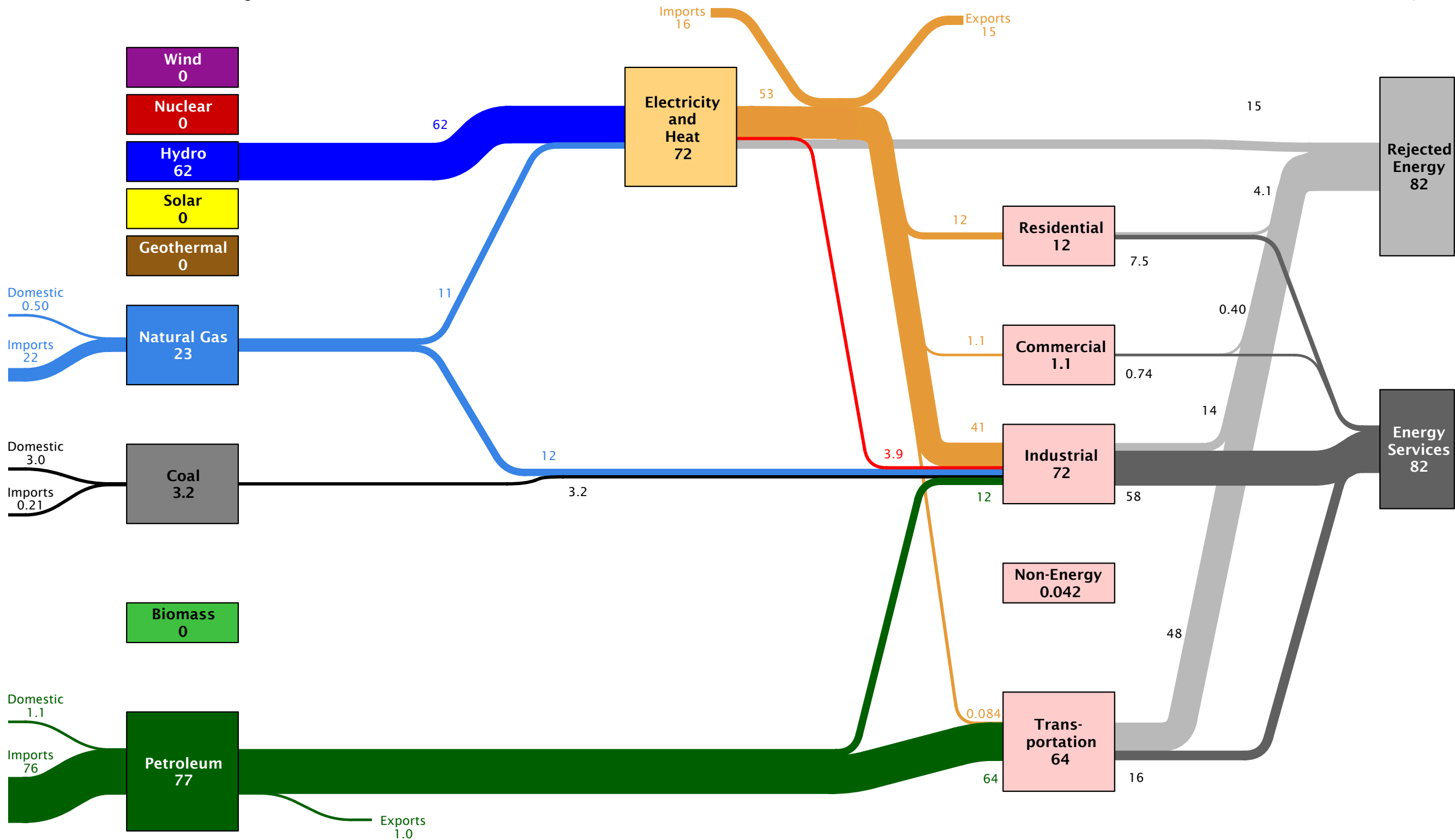
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Chinese Taipei (Taiwan) Energy Flow  
in 2007: ~4700 PJ



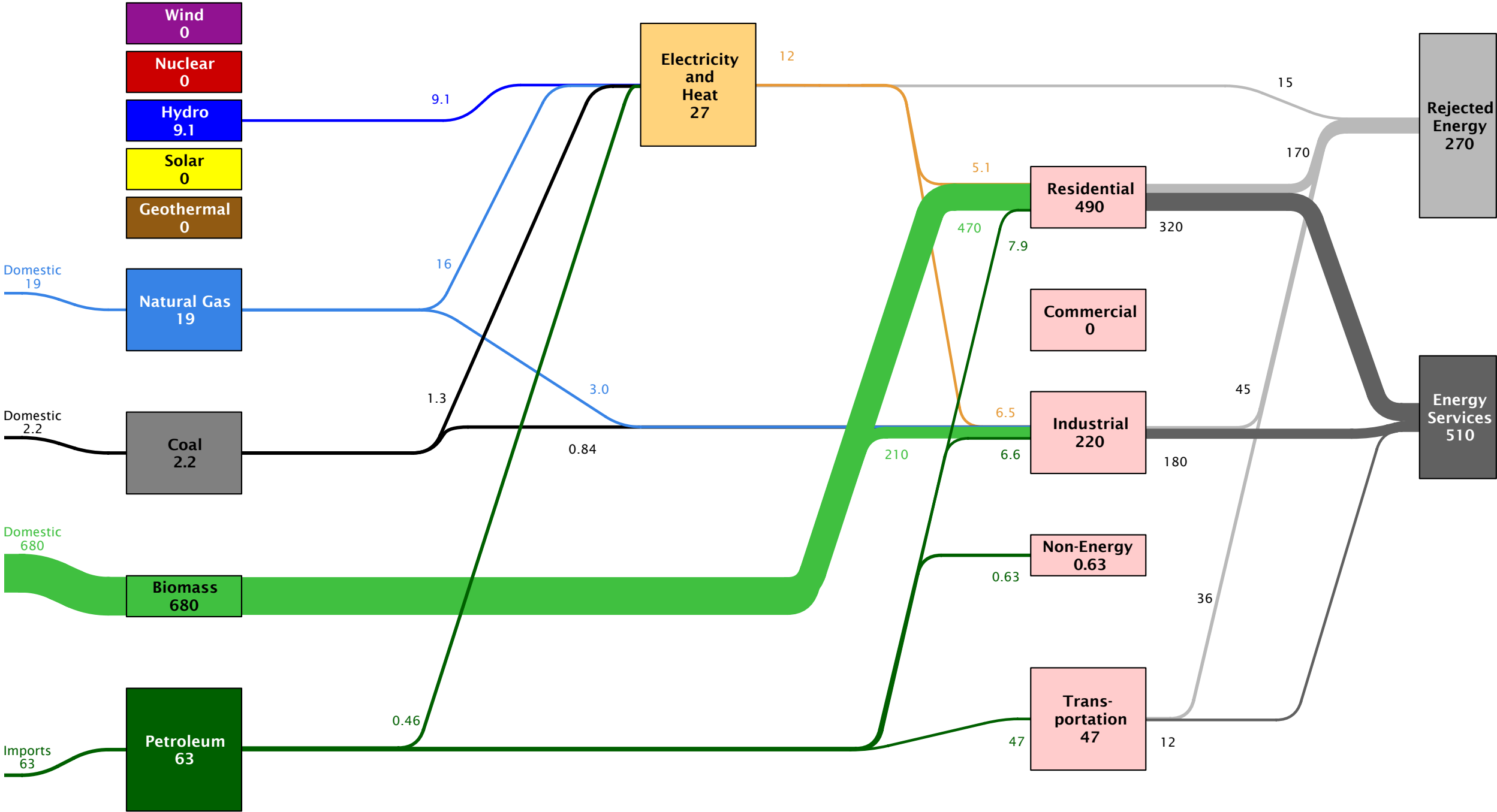
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Tajikistan Energy Flow in 2007: ~160 PJ



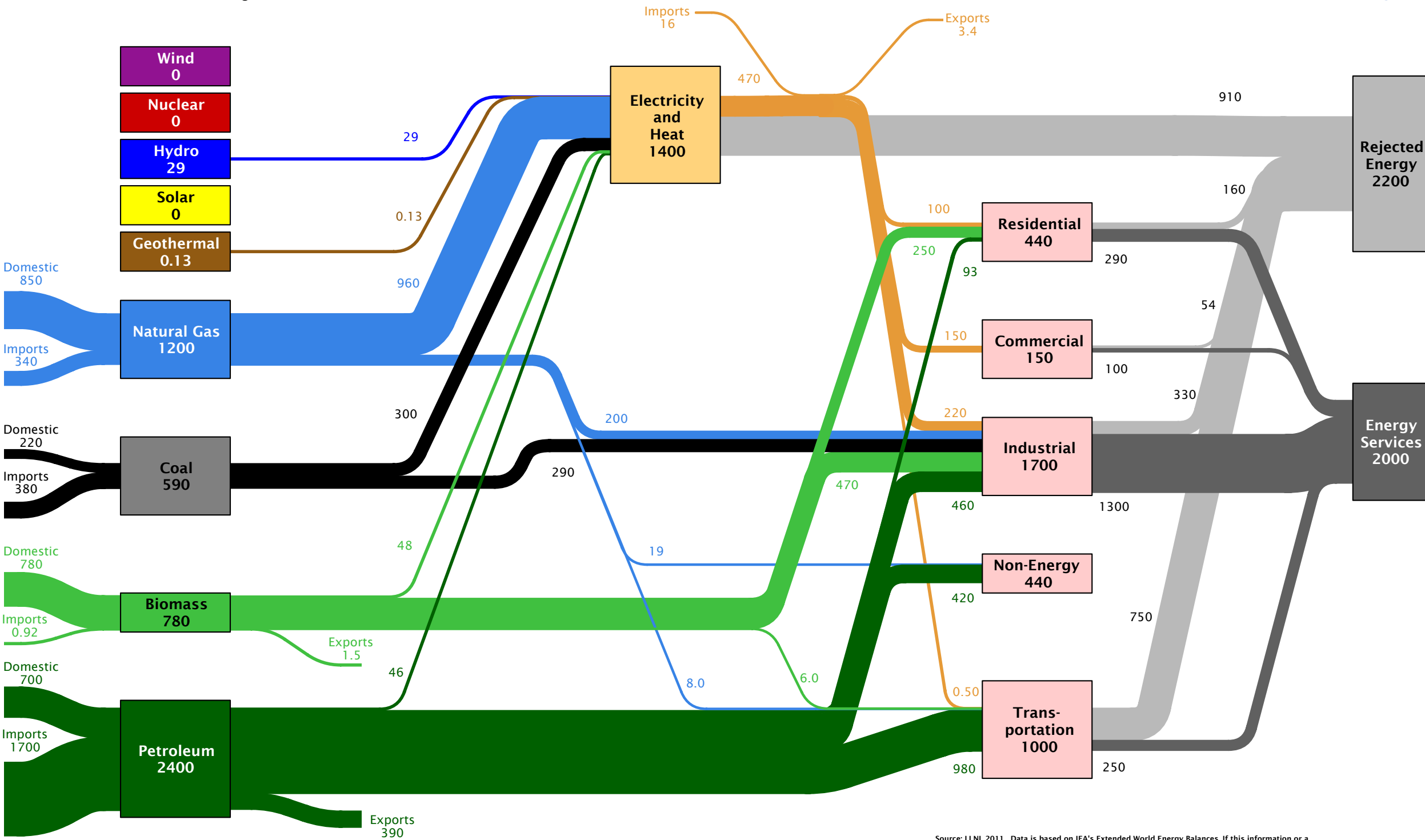
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Tanzania Energy Flow  
in 2007: ~770 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

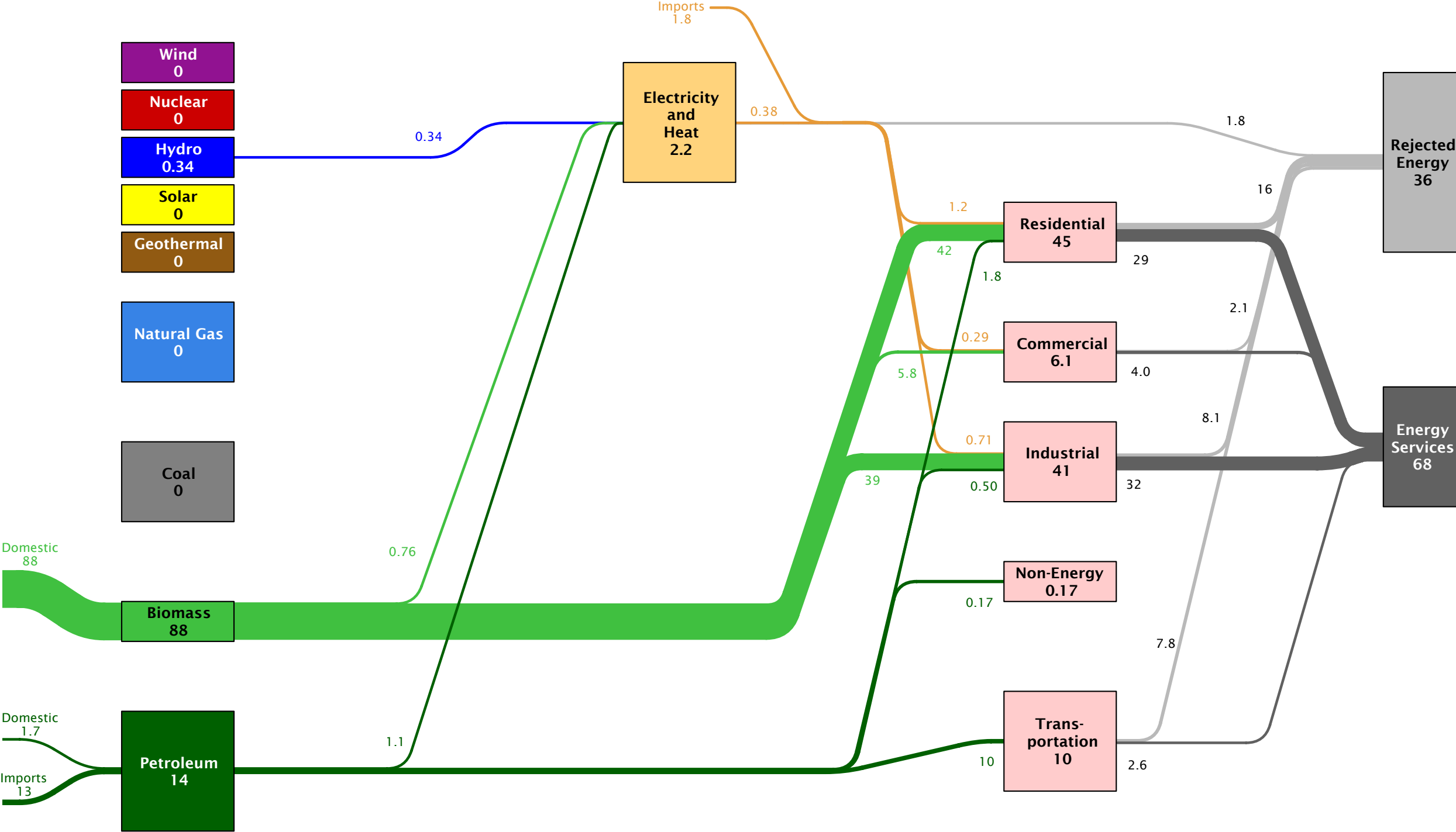
# Thailand Energy Flow in 2007: ~4600 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

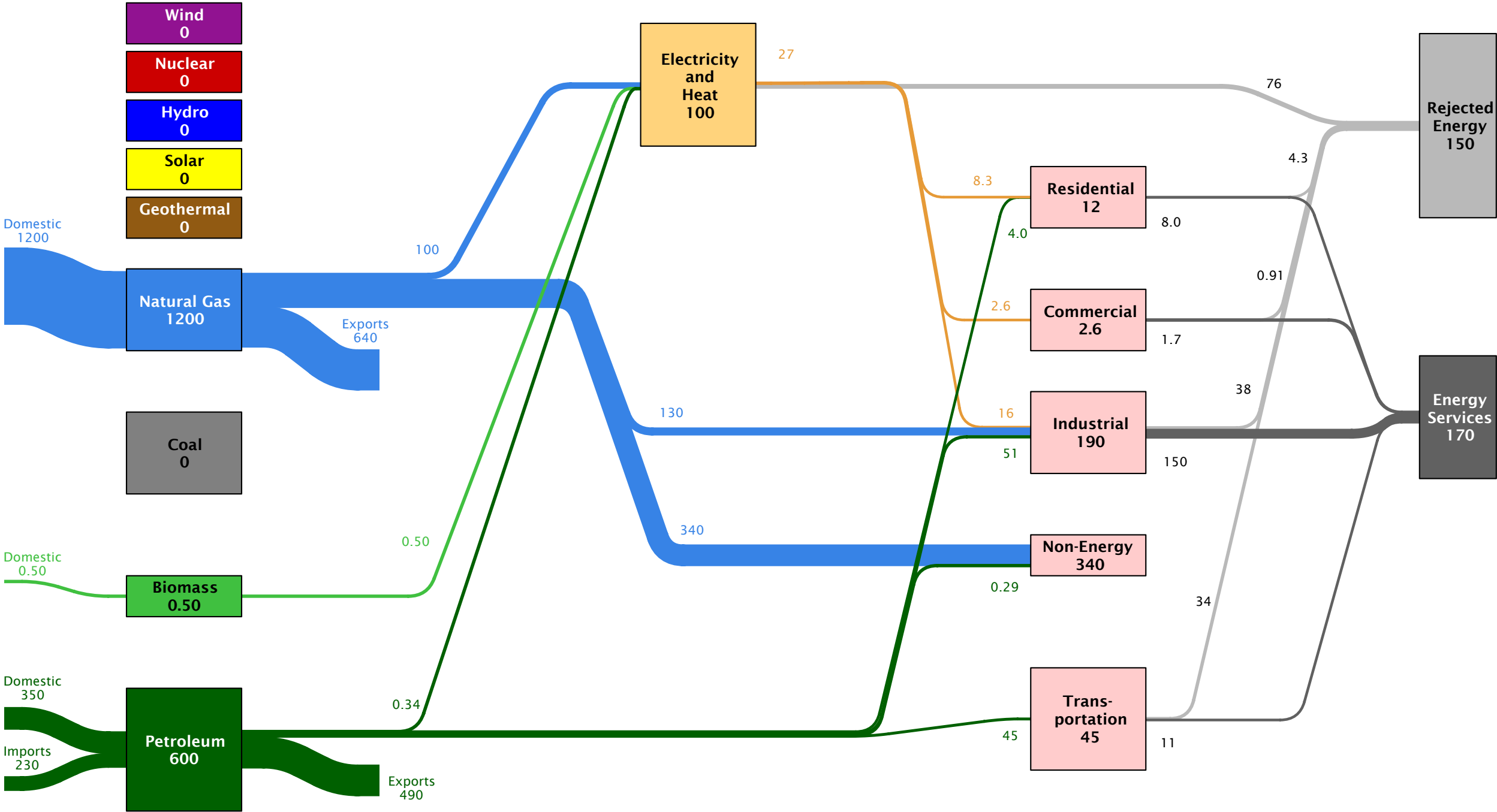


Togo Energy Flow  
in 2007: ~100 PJ



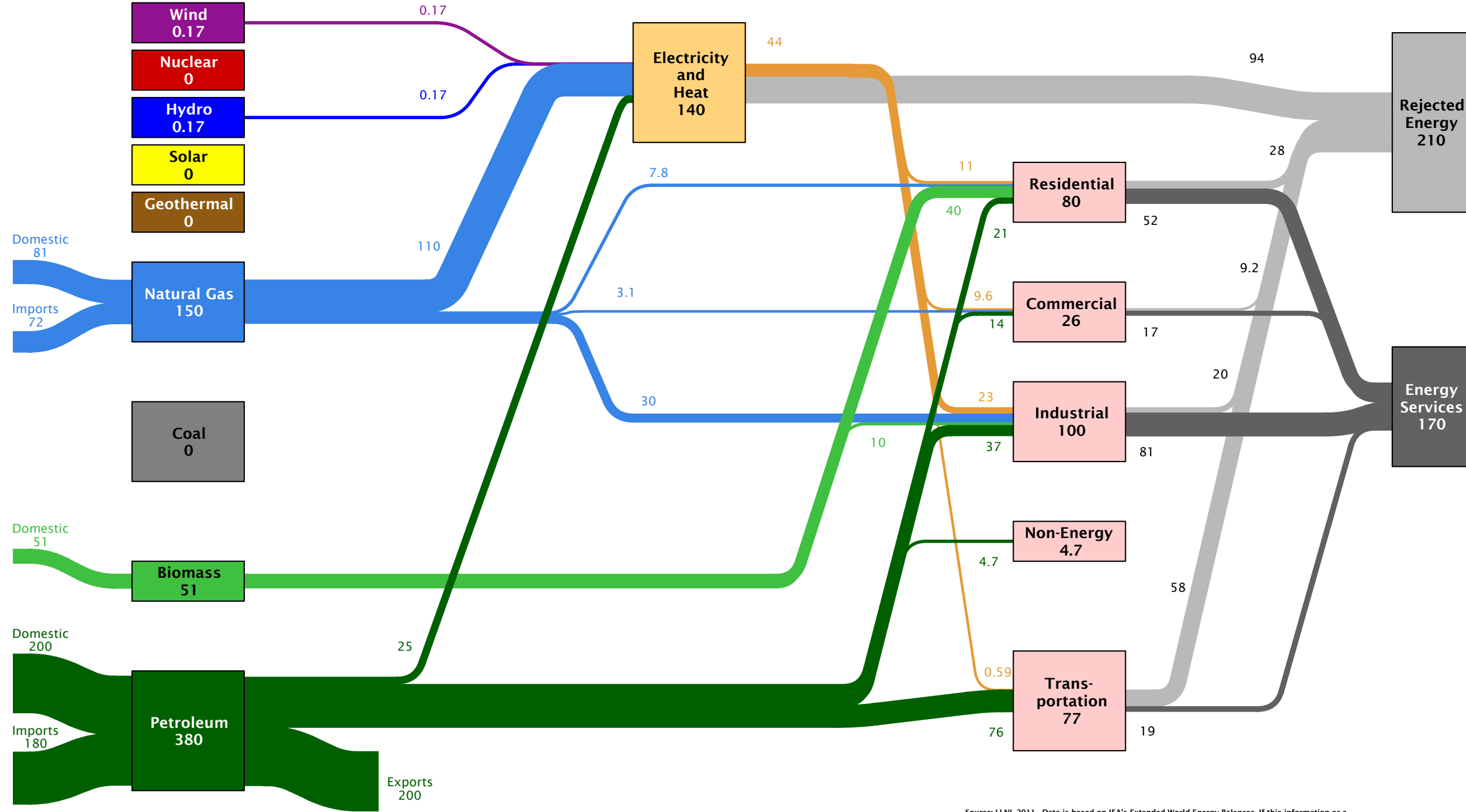
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Trinidad and Tobago Energy Flow  
in 2007: ~670 PJ



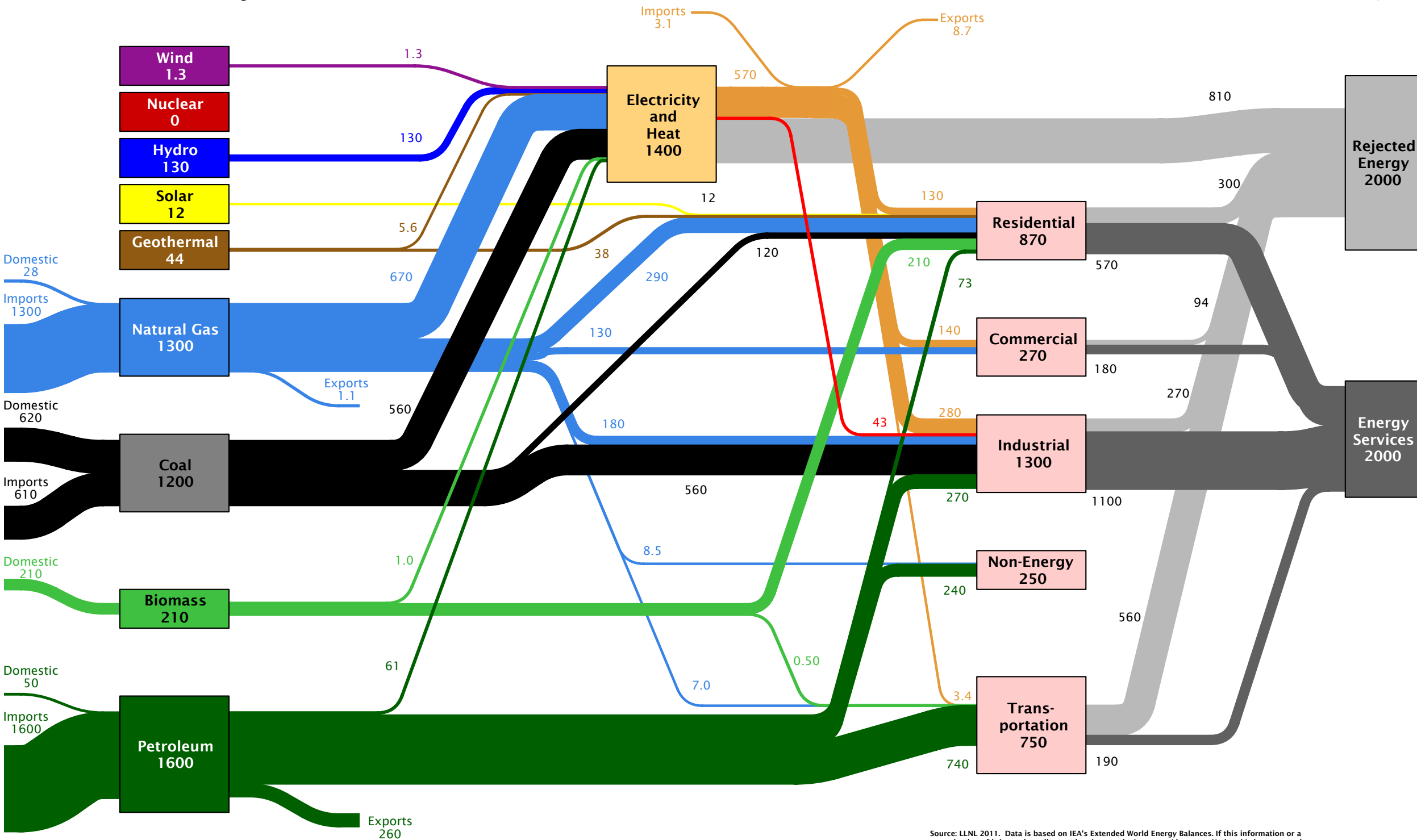
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Tunisia Energy Flow  
in 2007: ~380 PJ



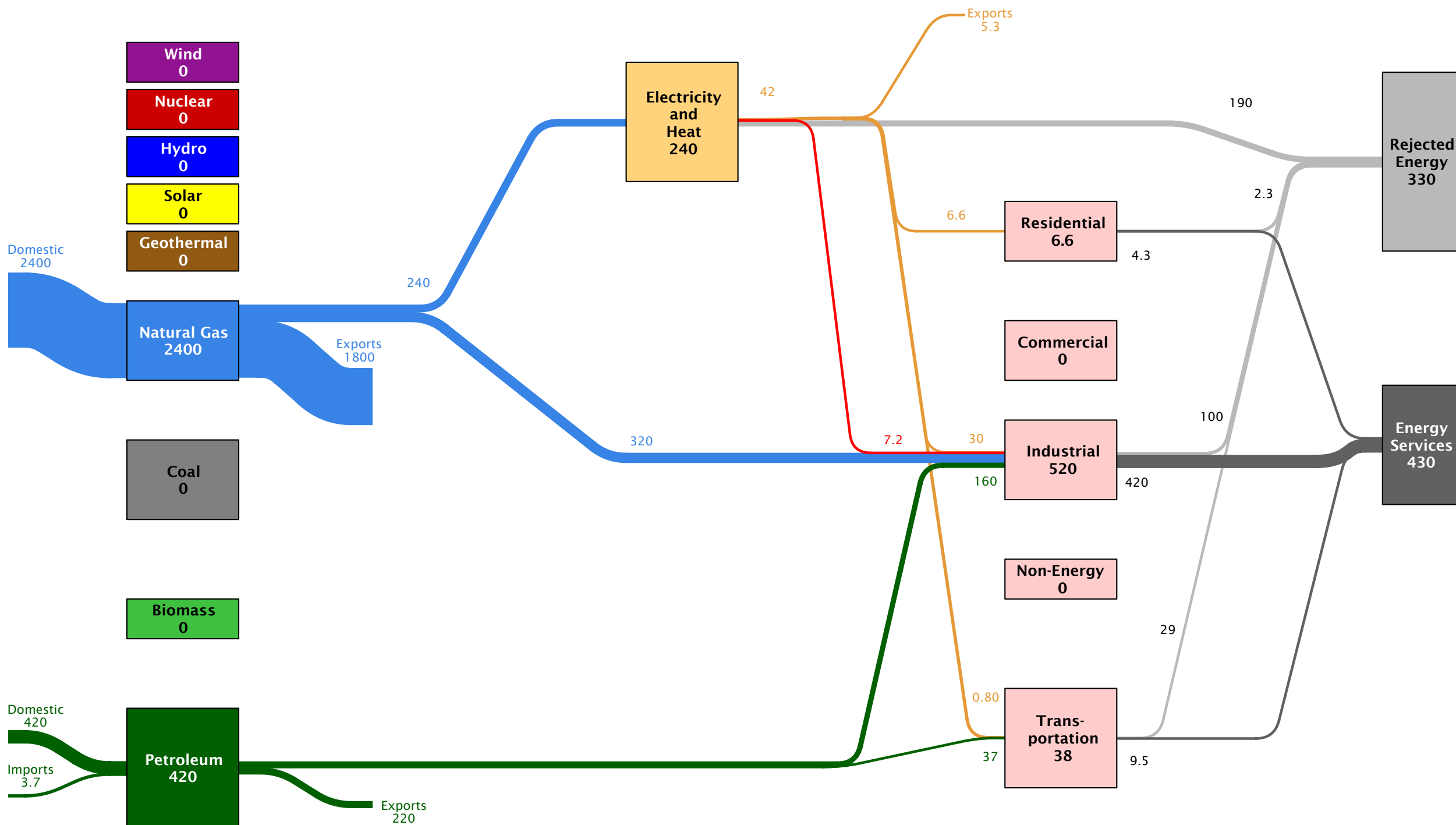
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Turkey Energy Flow in 2007: ~4300 PJ

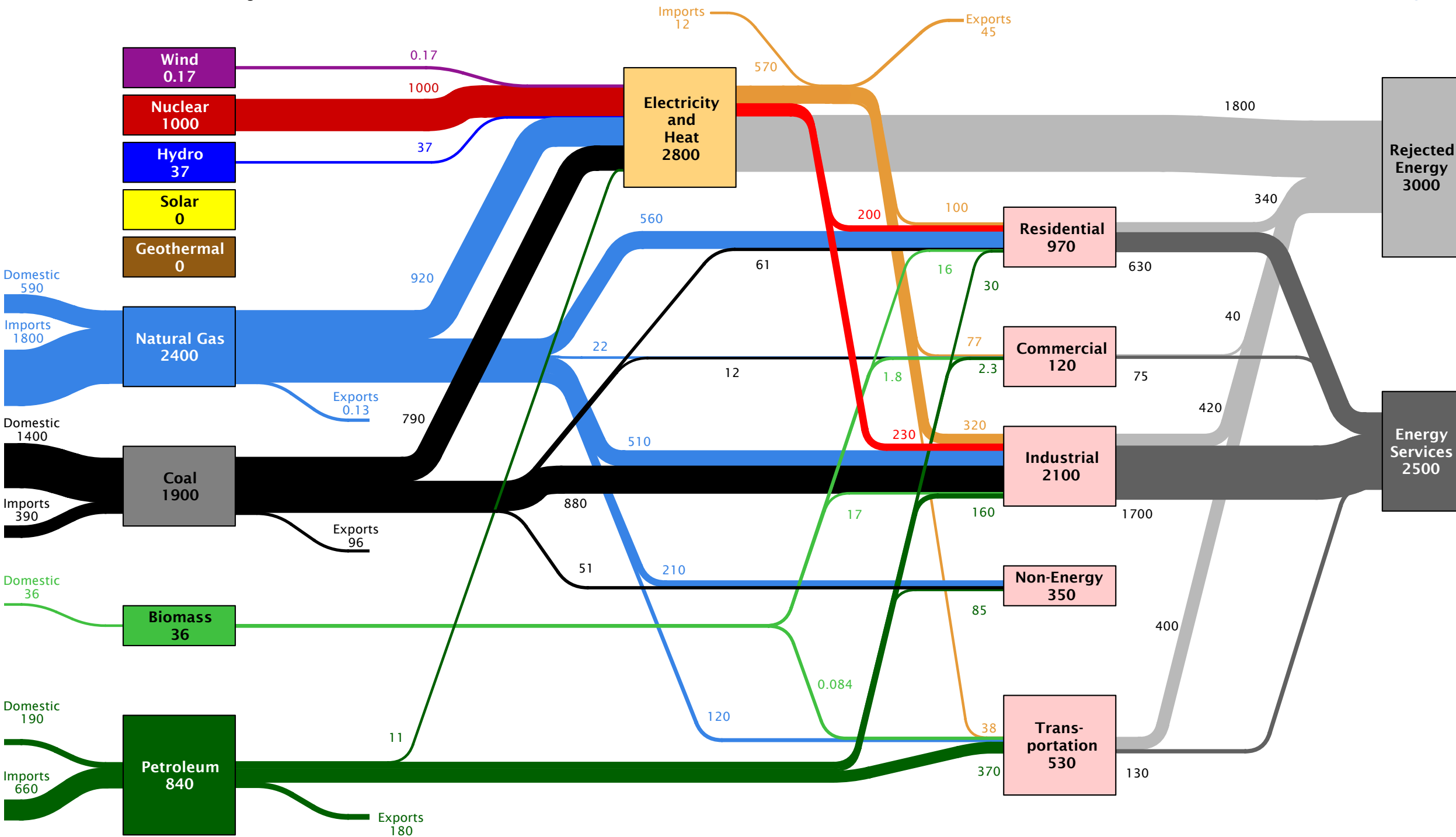


Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

# Turkmenistan Energy Flow in 2007: ~760 PJ

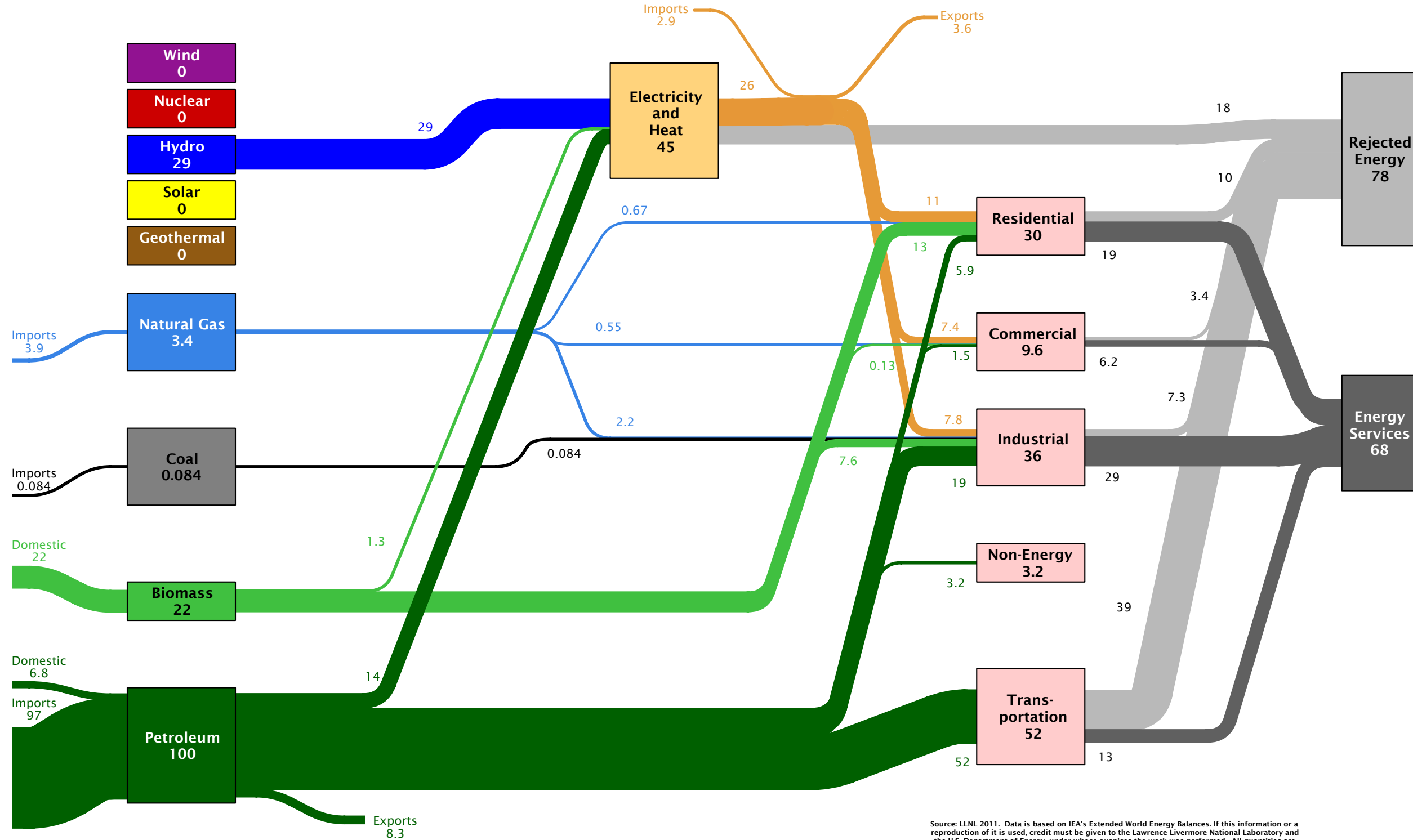


Ukraine Energy Flow  
in 2007: ~5900 PJ



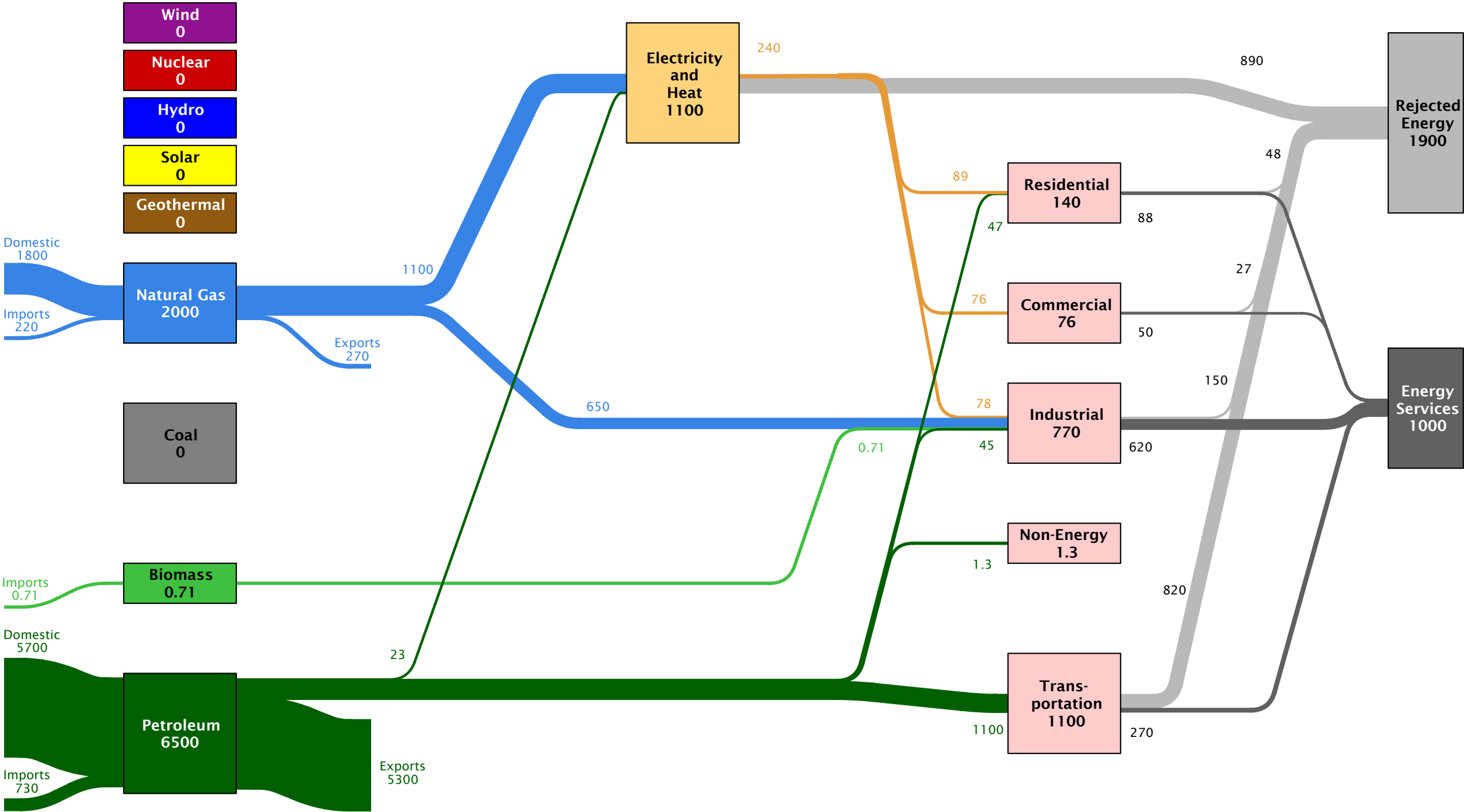
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Uruguay Energy Flow  
in 2007: ~150 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

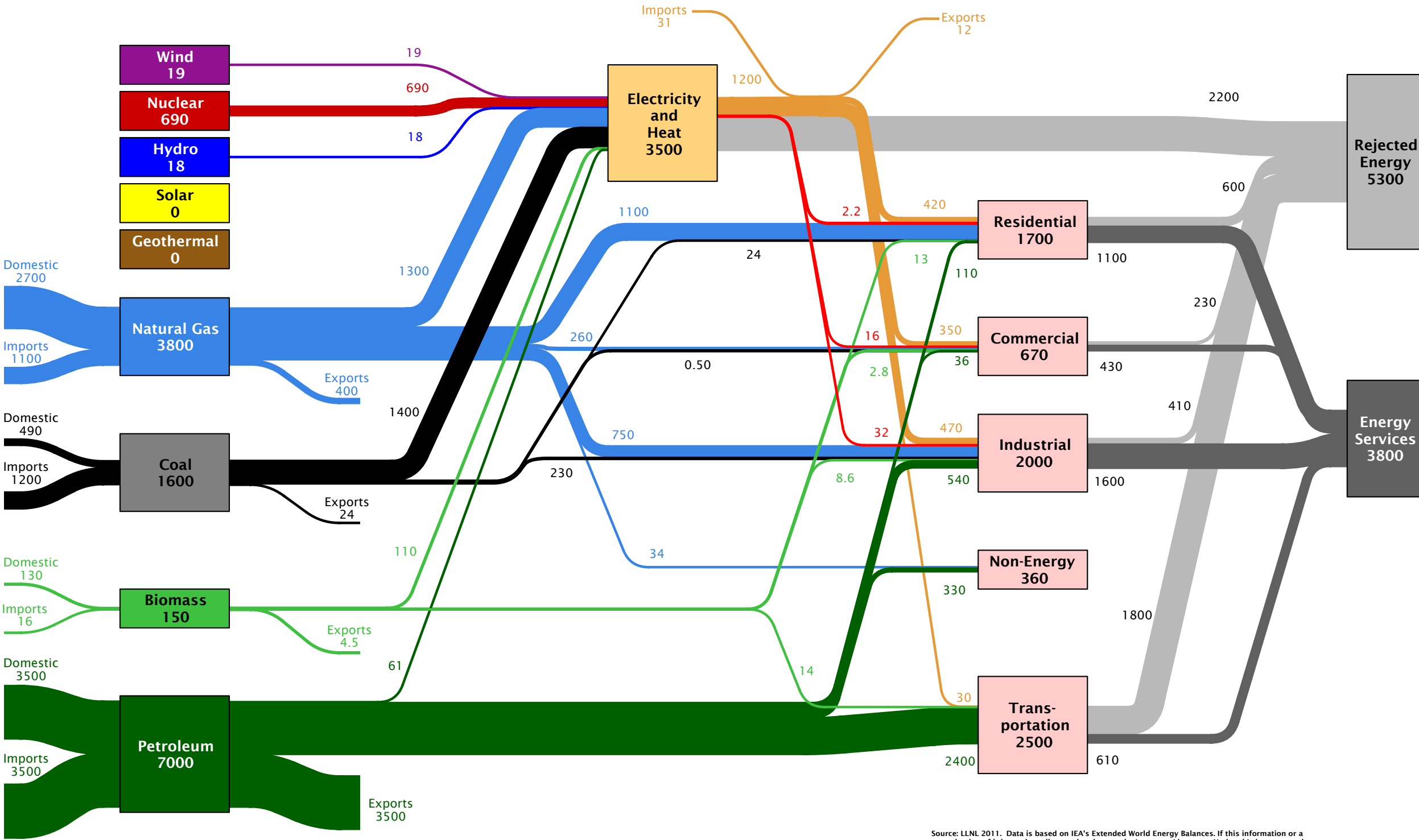
United Arab Emirates Energy Flow  
in 2007: ~3000 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

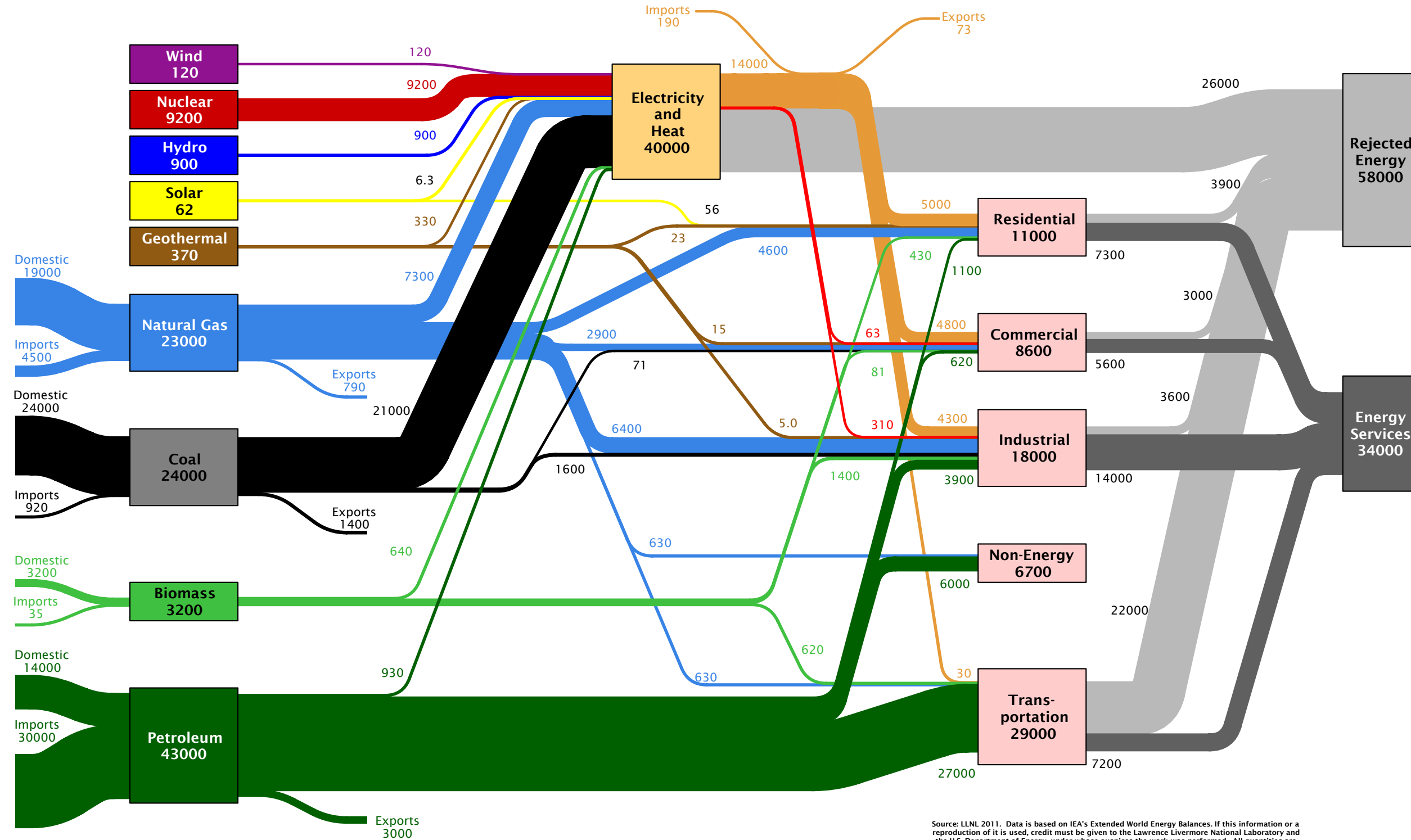


United Kingdom Energy Flow  
in 2007: ~9400 PJ



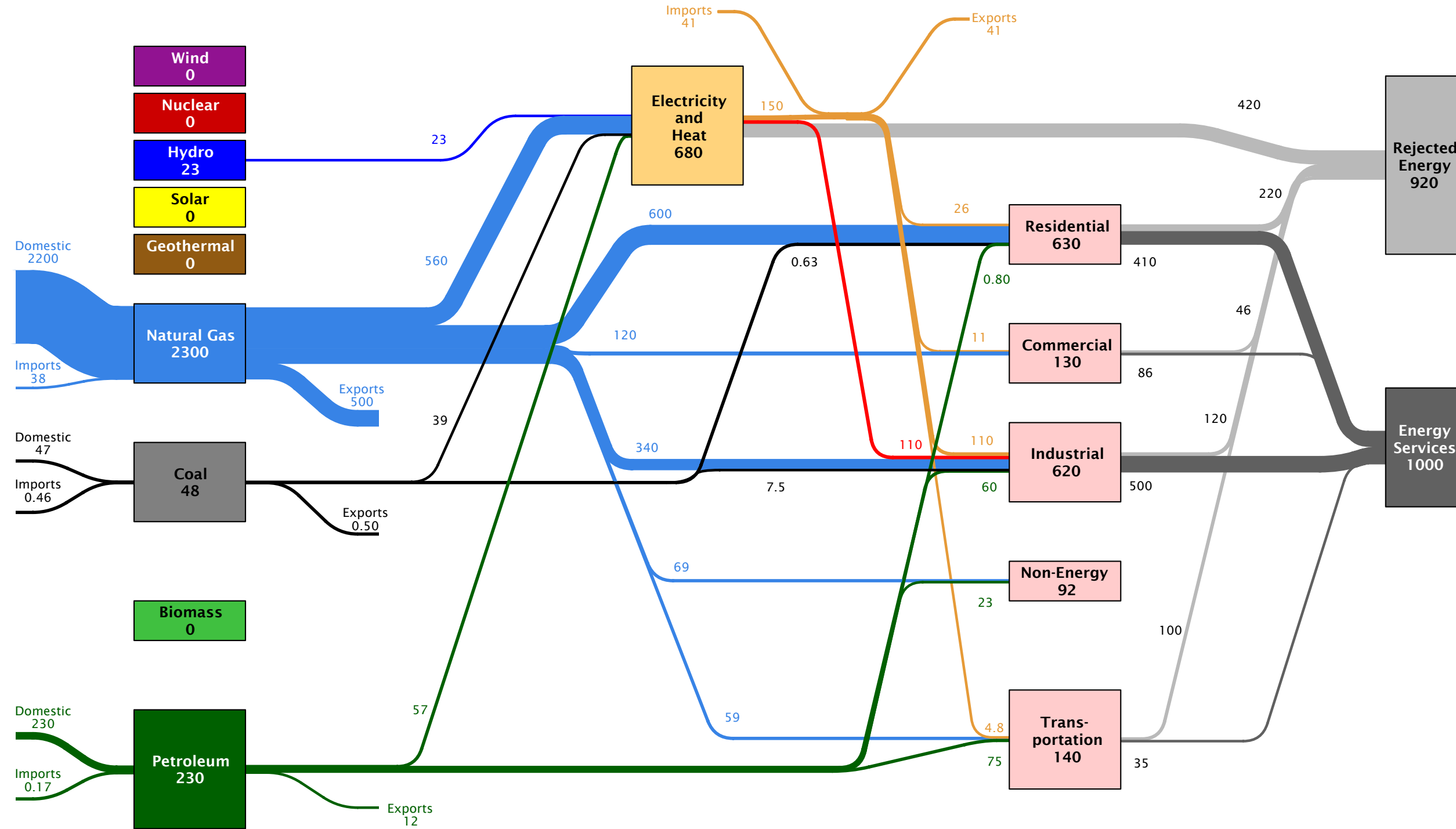
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

United States Energy Flow  
in 2007: ~99000 PJ



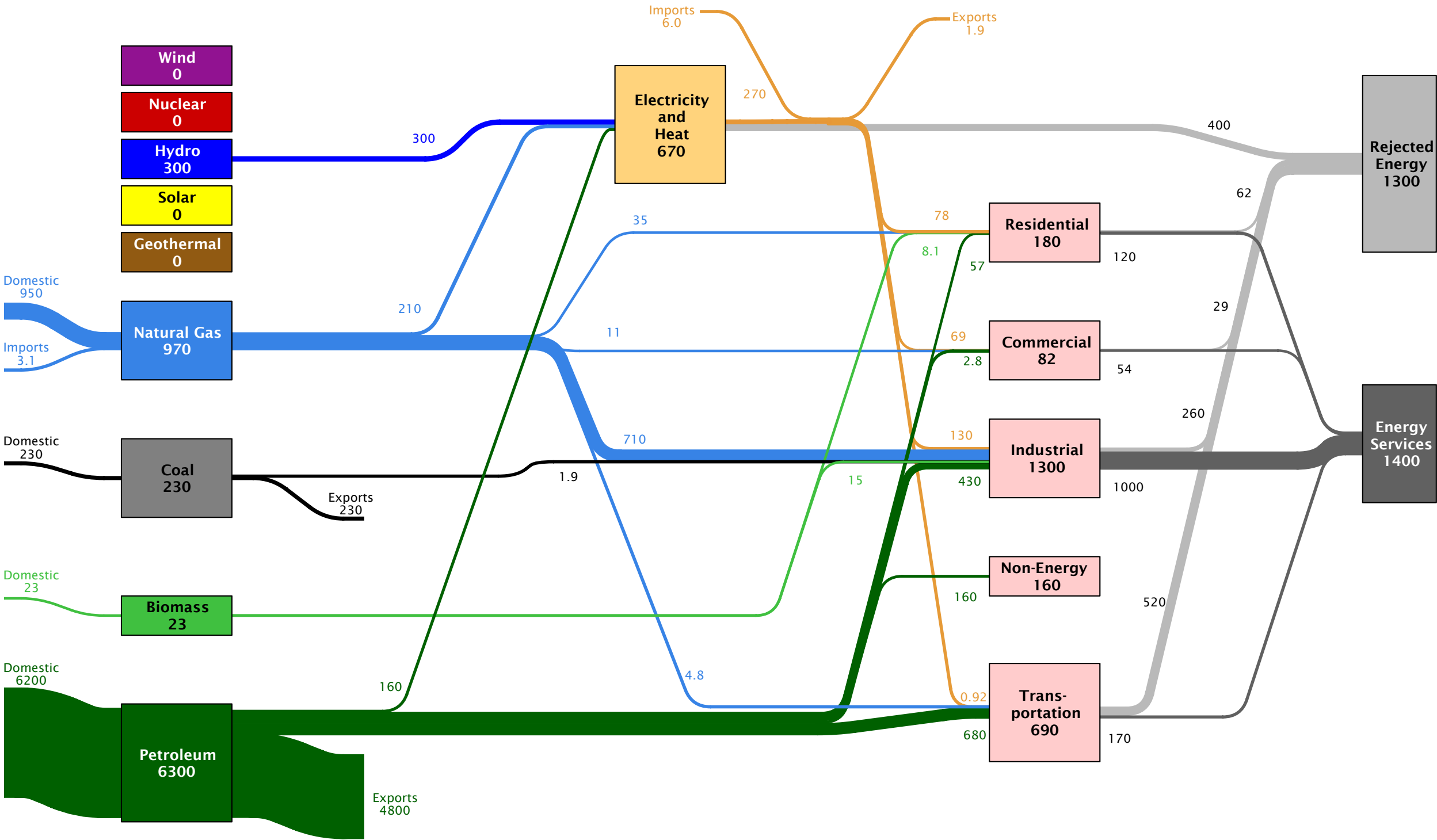
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Uzbekistan Energy Flow  
in 2007: ~2000 PJ



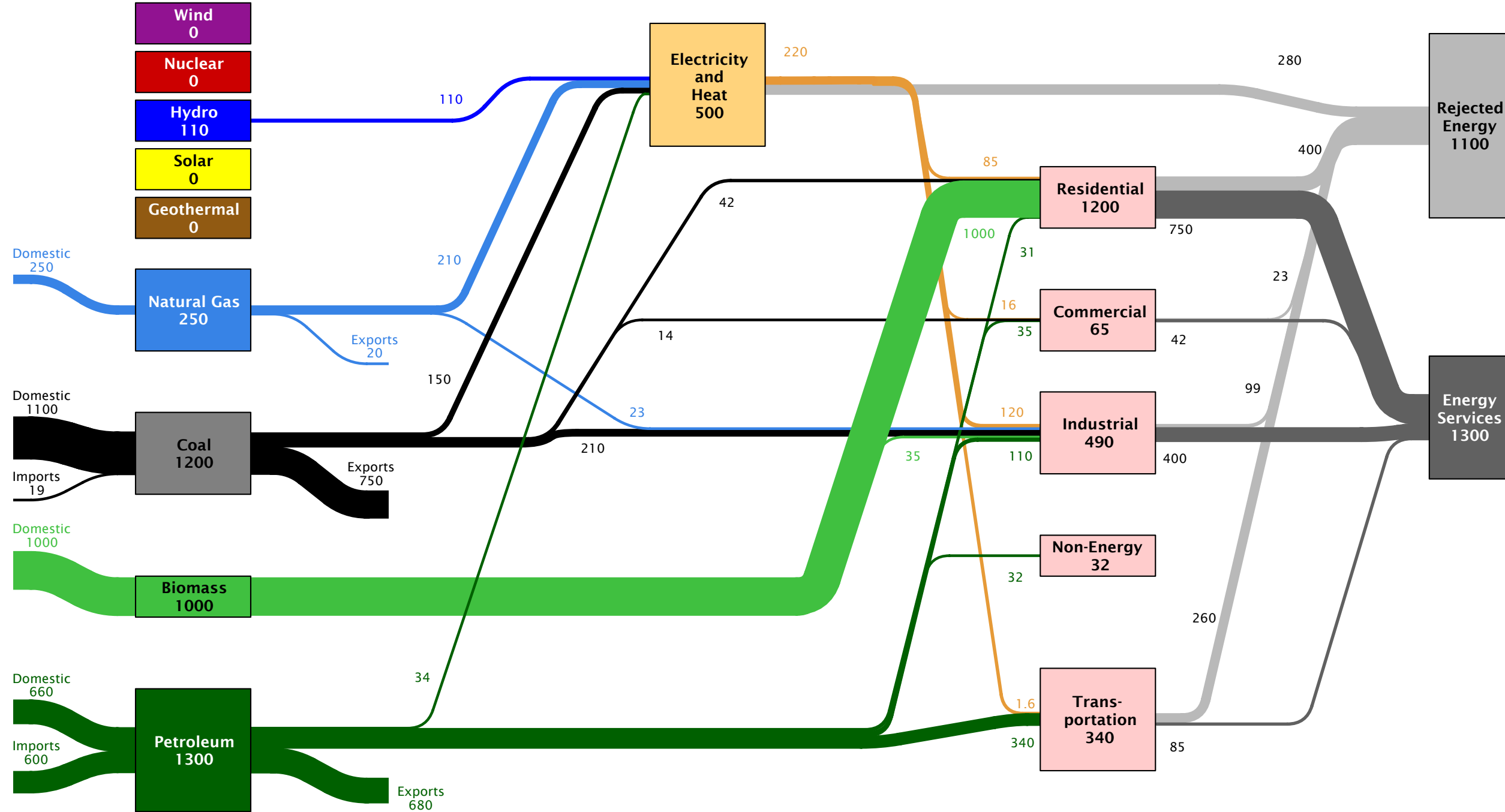
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Venezuela Energy Flow  
in 2007: ~2800 PJ



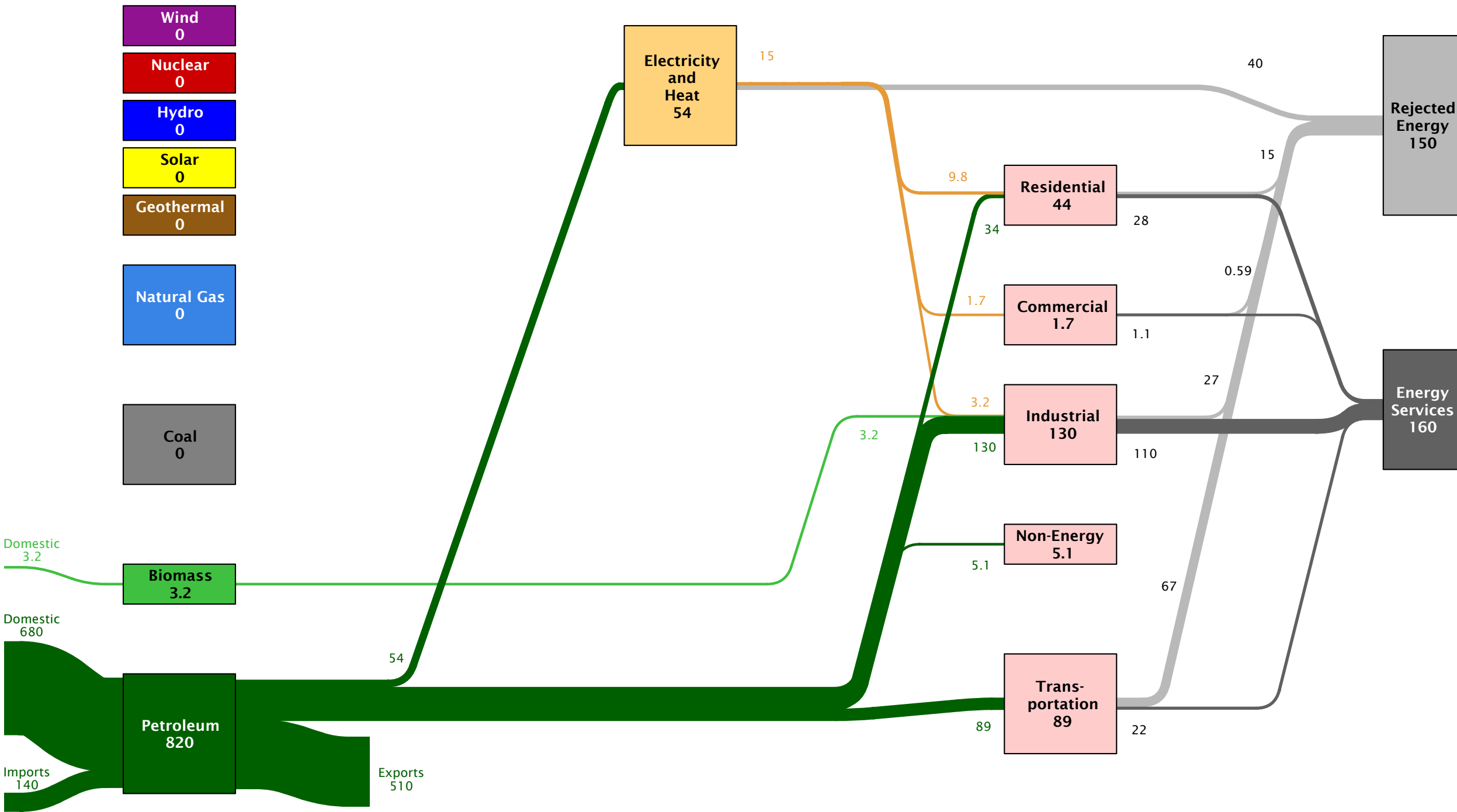
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Vietnam Energy Flow  
in 2007: ~2400 PJ



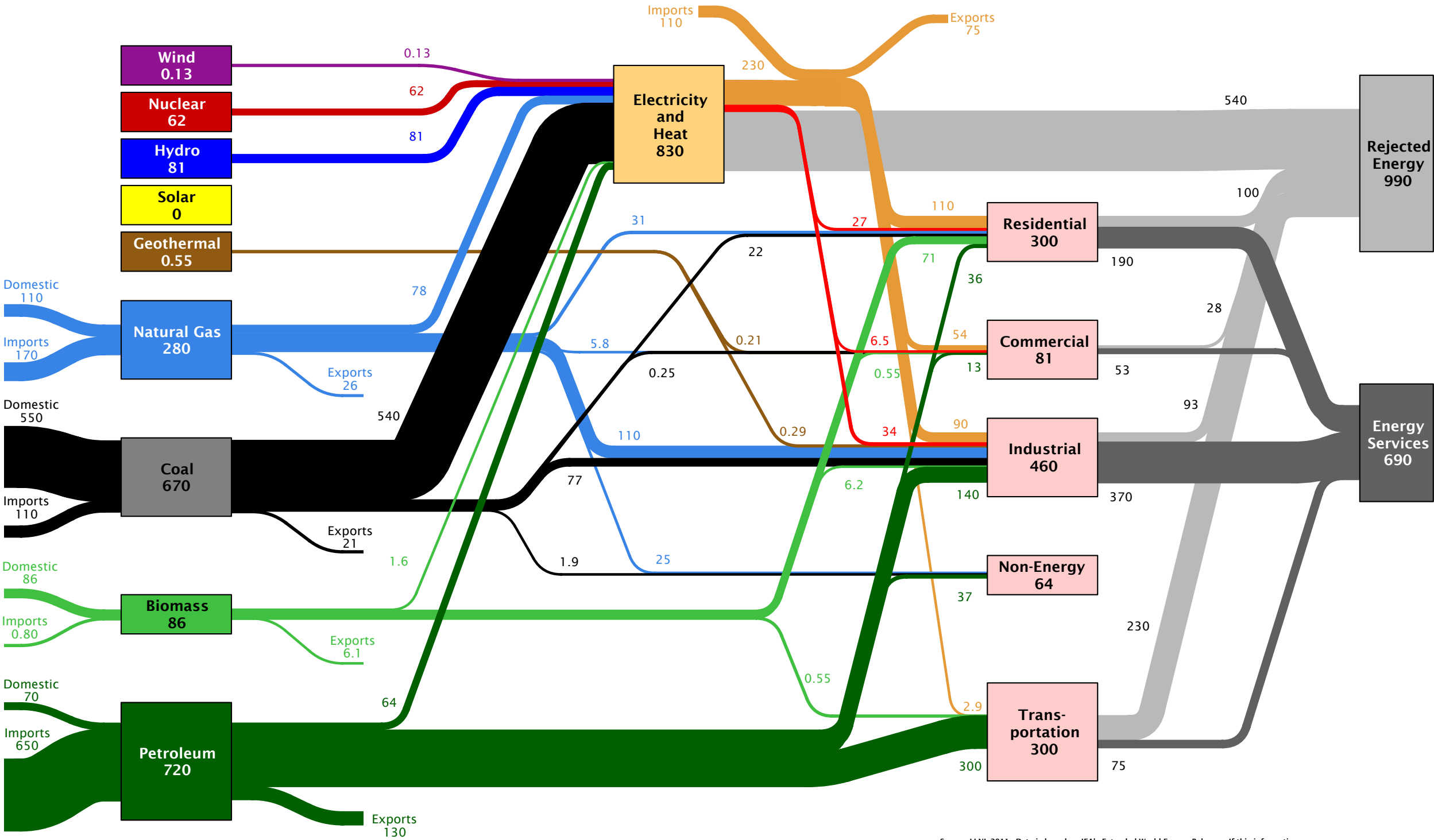
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Yemen Energy Flow  
in 2007: ~310 PJ



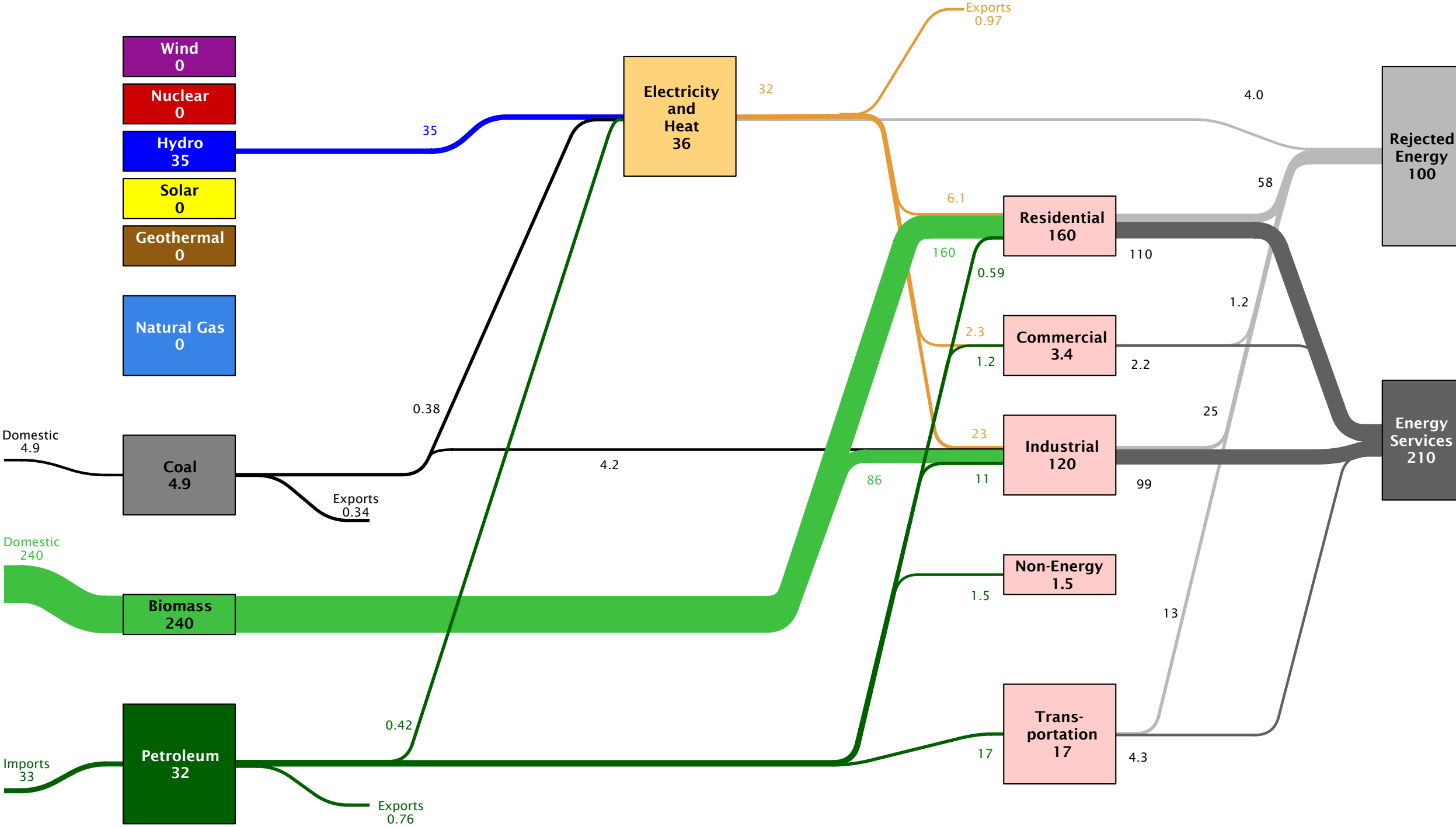
Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

Former Yugoslavia Energy Flow  
in 2007: ~1700 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

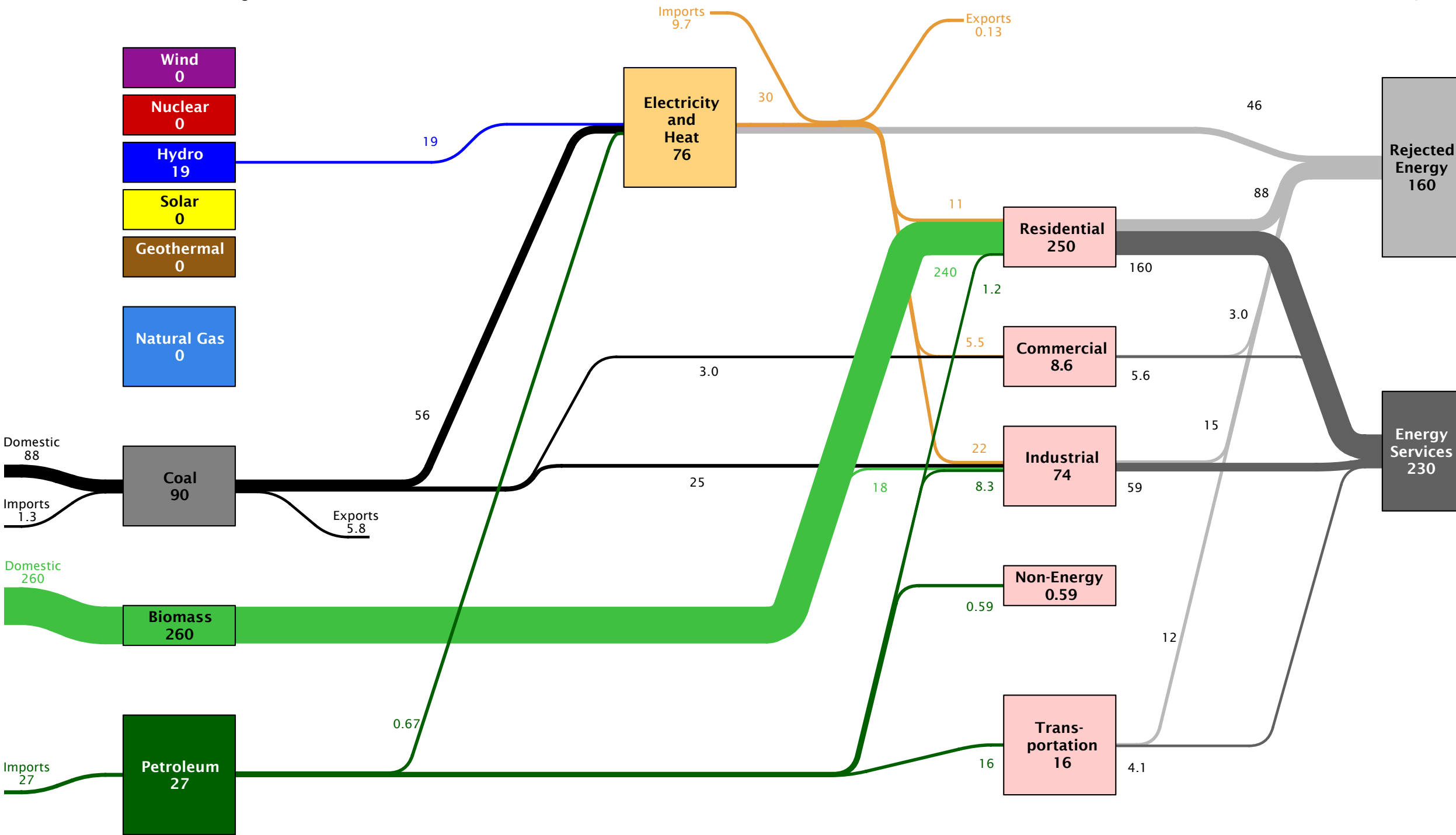
Zambia Energy Flow  
in 2007: ~320 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

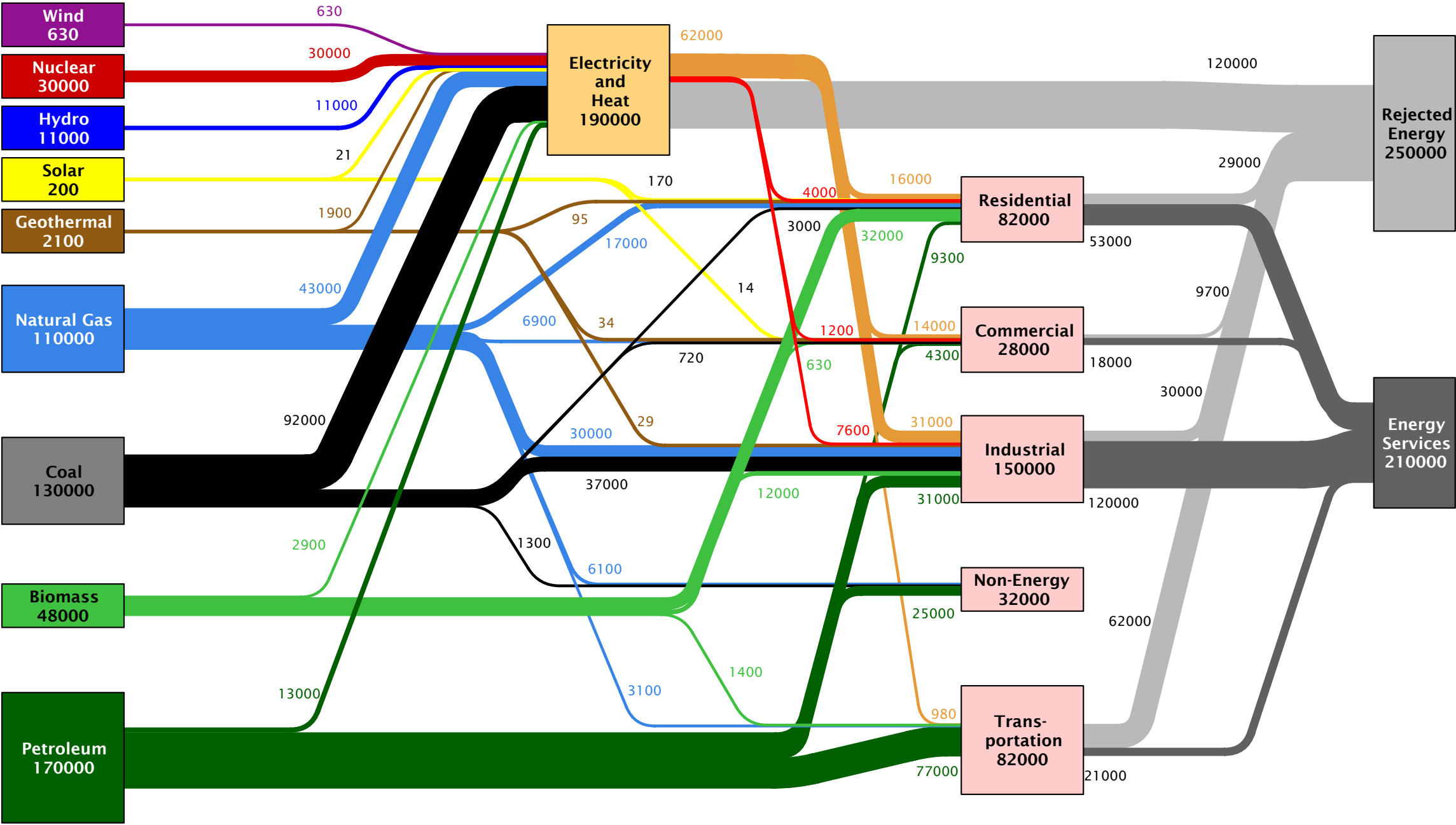


Zimbabwe Energy Flow  
in 2007: ~400 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

World Energy Flow  
in 2007: ~490000 PJ



Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further detail on how all flows are calculated can be found at <http://flowcharts.llnl.gov>. LLNL-TR-473098.

## Analysis

IEA's extended world energy balances report energy transfers of 63 different commodities between 74 different economic activities. In order to concisely represent these energy flows, this analysis groups these commodities and activities as follows:

### Commodities

#### **Coal and Coal-Based**

##### **Fuels:**

Hard coal  
Brown coal  
Anthracite  
Coking coal  
Other bituminous coal  
Sub-bituminous coal  
Lignite/brown coal  
Peat  
Patent fuel  
Coke oven coke  
Gas coke  
Coal tar  
BKB/peat briquettes  
Gas works gas  
Coke oven gas  
Blast furnace gas  
Oxygen steel furnace gas  
Elec/heat output from non-spec. manuf. Gases

##### **Wind:**

Wind

##### **Nuclear:**

Nuclear

##### **Hydro:**

Hydro

##### **Solar:**

Solar photovoltaic  
Solar thermal

#### **Geothermal:**

Geothermal

#### **Natural Gas:**

Natural Gas

#### **Biomass and Renewable**

##### **Waste:**

Renewable municipal waste  
Primary solid biomass  
Biogas  
Biogasoline  
Biodiesels  
Other liquid biofuels  
Non-specified combust.  
renewables + wastes  
Charcoal

#### **Electricity:**

Electricity

#### **Heat:**

Heat  
Heat output from non-specified combustion  
fuels

#### **Other:**

*(IEA reports no significant flows of these forms of energy in any country)*  
Tide, wave and ocean  
Other sources

#### **Petroleum and Petroleum-Derived Fuels:**

Crude oil  
Natural gas liquids  
Industrial waste  
Non-renewable municipal waste  
Refinery feedstocks  
Additives/blending components  
Other hydrocarbons  
Refinery gas  
Ethane  
Liquefied petroleum gases (LPG)  
Motor gasoline  
Aviation gasoline  
Gasoline type jet fuel  
Kerosene type jet fuel  
Kerosene  
Gas/diesel oil  
Heavy fuel oil  
Naphtha  
White spirit & SBP  
Lubricants  
Bitumen  
Paraffin waxes  
Petroleum coke  
Non-specified petroleum products

## Economic Activities

### **Industrial:**

(includes energy extraction and fuel production)  
Heat pumps  
Charcoal production plants  
Gas-to-liquids (GTL) plants  
Electric boilersNon-specified (transformation)  
Nuclear industry  
Chemical heat for electricity production Coal mines  
Charcoal production plants  
Blast furnaces Oil and gas extraction  
Non-specified (energy)  
Gas works  
Blast furnaces Iron and steel  
Coke ovens  
Gas works  
Chemical and petrochemical  
Patent fuel plants  
Gasification plants for biogas  
Non-ferrous metals  
BKB plants  
Coke ovens  
Non-metallic minerals  
Petroleum refineries  
Patent fuel plants  
Transport equipment  
Petrochemical industry  
BKB plants  
Machinery  
Coal liquefaction plants  
Petroleum refineries

### *Industrial (cont.):*

Mining and quarrying  
Gas-to-liquids (GTL) plants  
Coal liquefaction plants  
Food and tobacco  
For blended natural gas  
Liquefaction (LNG) / regasification plants  
Paper, pulp and print  
Agriculture/forestry  
Construction  
Wood and wood products  
FishingTextile and leather  
Non-specified (industry)  
Non-specified (other)

### **Non-Energy:**

(conversion of energy feedstock to durable products)  
Non-energy use  
Non-energy use industry/transformation/energy  
Non-energy use in transport

### **Transportation:**

Domestic aviation  
Road  
Rail  
Pipeline transportDomestic navigation  
Non-specified (transport)  
International marine bunkers  
International aviation bunkers

### **Electricity and Heat**

#### **Production:**

Main activity producer electricity plants  
Autoproducer electricity plants  
Main activity producer CHP plants  
Autoproducer CHP plants  
Main activity producer heat plants  
Autoproducer heat plants  
Own use in electricity, CHP and heat plants  
Used for pumped storage  
Distribution losses

### **Residential:**

Residential

### **Commercial:**

Commercial and public services

### Balance of Trade:

In addition to economic activity, IEA's extended energy balances also report the domestic production ("Production"), Imports, and Exports associated with each commodity.

### **Flow Definitions:**

#### Wind:

Wind -> Electricity and Heat

Sum of flows of all items in *Wind* to all activities in *Electricity and Heat Production*

#### Nuclear:

Nuclear -> Electricity and Heat

Sum of flows of all items in *Nuclear* to/from all activities in *Electricity and Heat Production*

#### Hydro:

Hydro -> Electricity and Heat

Sum of flows of all items in *Hydro* to/from all activities in *Electricity and Heat Production*

#### Solar:

Solar -> Electricity and Heat

Sum of flows of all items in *Solar* to/from all activities in *Electricity and Heat Production*

Solar -> Residential

Sum of flows of all items in *Solar* to/from all activities in *Residential*

Solar -> Commercial

Sum of flows of all items in *Solar* to/from all activities in *Commercial*

#### Geothermal:

Geothermal -> Electricity and Heat

Sum of flows of all items in *Geothermal* to/from all activities in *Electricity and Heat Production*

Geothermal -> Residential

Sum of flows of all items in *Geothermal* to/from all activities in *Residential*

Geothermal -> Commercial

Sum of flows of all items in *Geothermal* to/from all activities in *Commercial*

### Geothermal (con't):

Geothermal -> Industrial

Sum of flows of all items in *Geothermal* to/from all activities in *Industrial*

### Natural Gas:

Domestic -> Natural Gas

Sum of *Production* of all items in *Natural Gas*

Imported -> Natural Gas

Sum of *Imports* of all items in *Natural Gas*

Natural Gas -> Exports

Sum of *Exports* of all items in *Natural Gas*

Natural Gas -> Electricity and Heat

Sum of flows of all items in *Natural Gas* to/from all activities in *Electricity and Heat Production*

Natural Gas -> Residential

Sum of flows of all items in *Natural Gas* to/from all activities in *Residential*

Natural Gas -> Commercial

Sum of flows of all items in *Natural Gas* to/from all activities in *Commercial*

Natural Gas -> Industrial

Sum of flows of all items in *Natural Gas* to/from all activities in *Industrial*

Natural Gas -> Non Energy

Sum of flows of all items in *Natural Gas* to/from all activities in *Non-Energy*

Natural Gas -> Transportation

Sum of flows of all items in *Natural Gas* to/from all activities in *Transportation*

### Coal:

Domestic -> Coal

Sum of *Production* of all items in *Coal and Coal-Based Fuels*

Imported -> Coal

Sum of *Imports* of all items in *Coal and Coal-Based Fuels*

Coal -> Exports

Sum of *Exports* of all items in *Coal and Coal-Based Fuels*

### Coal (con't):

Coal -> Electricity and Heat

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Electricity and Heat Production*

Coal -> Residential

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Residential*

Coal -> Commercial

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Commercial*

Coal -> Industrial

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Industrial*

Coal -> Non Energy

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Non-Energy*

### Biomass:

Domestic -> Biomass

Sum of *Production* of all items in *Biomass and Renewable Waste Fuels*

Imported -> Biomass

Sum of *Imports* of all items in *Biomass and Renewable Waste Fuels*

Biomass -> Exports

Sum of *Exports* of all items in *Biomass and Renewable Waste Fuels*

Biomass -> Electricity and Heat

Sum of flows of all items in *Biomass and Renewable Waste Fuels* to/from all activities in *Electricity and Heat Production*

Biomass -> Residential

Sum of flows of all items in *Biomass and Renewable Waste Fuels* to/from all activities in *Residential*

Biomass -> Commercial

Sum of flows of all items in *Biomass and Renewable Waste Fuels* to/from all activities in *Commercial*

Biomass -> Industrial

Sum of flows of all items in *Biomass and Renewable Waste Fuels* to/from all activities in *Industrial*

Biomass (con't):

Biomass -> Transportation

Sum of flows of all items in *Biomass and Renewable Waste Fuels* to/from all activities in *Transportation*

Petroleum:

Domestic -> Petroleum

Sum of *Production* of all items in *Petroleum and Petroleum-Derived Fuels*

Imported -> Petroleum

Sum of *Imports* of all items in *Petroleum and Petroleum-Derived Fuels*

Petroleum -> Exports

Sum of *Exports* of all items in *Petroleum and Petroleum-Derived Fuels*

Petroleum -> Electricity and Heat

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Electricity and Heat Production*

Petroleum -> Residential

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Residential*

Petroleum -> Commercial

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Commercial*

Petroleum -> Industrial

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Industrial*

Petroleum -> Non Energy

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Non-Energy*

Petroleum -> Transportation

Sum of flows of all items in *Petroleum and Petroleum-Derived Fuels* to/from all activities in *Transportation*



## Electricity and Heat:

Electricity Imports-> Electricity  
*Imports of Electricity*

Electricity -> Electricity Exports  
*Exports of Electricity*

Electricity and Heat -> Residential (Electricity, Orange)  
*Electricity flow to/from Residential*

Electricity and Heat -> Commercial (Electricity, Orange)  
*Electricity flow to/from Commercial*

Electricity and Heat -> Industrial (Electricity, Orange)  
*Electricity flow to/from all activities in Industrial*

Electricity and Heat -> Transportation (Electricity, Orange)  
*Electricity flow to/from all activities in Transportation*

Production of Electricity:

Sum of *Electricity* flow to/from *Residential*, *Commercial*, *Industrial* and *Transportation* sectors;  
plus the difference between *Electricity Exports* and *Electricity Imports*

Electricity and Heat -> Residential (Heat, Red)  
Flow of all commodities in *Heat* to/from *Residential*

Electricity and Heat -> Commercial (Heat, Red)  
Flow of all commodities in *Heat* to/from *Commercial*

Electricity and Heat -> Industrial (Heat, Red)  
Flow of all commodities in *Heat* to/from all activities in *Industrial*

Electricity and Heat -> Rejected Energy (Gray)  
Difference between the sum of all flows into Electricity and Heat (from *Wind*, *Nuclear*, *Hydro*, *Solar*, *Geothermal*, *Natural Gas*, *Coal*, *Biomass*, and *Petroleum*) and the sum of all flows out of Electricity and Heat (*Electricity* and *Heat* consumption by *Residential*, *Commercial*, *Industrial*, and *Transportation*)

## Liquefaction<sup>1</sup>

### Coal-> Liquefaction

Sum of flows of all items in *Coal and Coal-Based Fuels* to/from all activities in *Coal Liquefaction Plants*

### Liquefaction -> Petroleum and Petroleum Derived Fuels

Sum of flows from *Coal Liquefaction Plants* that are considered *Petroleum and Petroleum Derived Fuels*

### Liquefaction -> Rejected Energy

Difference between the inputs to *Liquefaction* (from *Coal and Coal Derived Fuels*) and the outputs of synthetic *Petroleum and Petroleum Derived Fuels*.

## Rejected Energy:

### Residential -> Rejected Energy

The residential sector is assumed to have an energy efficiency of 65%.

This flow is calculated as 35% of the sum of all inputs (*Solar, Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste Fuels, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Residential* sector.

### Commercial -> Rejected Energy

The Commercial sector is assumed to have an energy efficiency of 65%.

This flow is calculated as 35% of the sum of all inputs (*Solar, Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste Fuels, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Commercial* sector.

### Industrial -> Rejected Energy

The Industrial sector is assumed to have an energy efficiency of 80%.

This flow is calculated as 20% of the sum of all inputs (*Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Industrial* sector.

### Transportation -> Rejected Energy

The Transportation sector is assumed to have an energy efficiency of 25%.

This flow is calculated as 75% of the sum of all inputs (*Natural Gas, Liquefaction, Biomass and Renewable Waste, Petroleum and Petroleum Derived Products, and Electricity*) to all activities in the *Transportation* sector.

---

<sup>1</sup> South Africa is the only country whose coal liquefaction sector is large enough to be shown outside of the industrial sector. In this case, the *Coal and Coal Based Fuels* inputs to *Coal Liquefaction Plants* are NOT included in the sum of industrial coal use, and the synthetic petroleum products of liquefaction are added to the flow of *Petroleum and Petroleum Derived Fuels*.

## Energy Services:

### Residential -> Energy Services

The residential sector is assumed to have an energy efficiency of 65%.

This flow is calculated as 65% of the sum of all inputs (*Solar, Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste Fuels, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Residential* sector.

### Commercial -> Energy Services

The Commercial sector is assumed to have an energy efficiency of 65%.

This flow is calculated as 65% of the sum of all inputs (*Solar, Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste Fuels, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Commercial* sector.

### Industrial -> Energy Services

The Industrial sector is assumed to have an energy efficiency of 80%.

This flow is calculated as 80% of the sum of all inputs (*Geothermal, Natural Gas, Coal and Coal Derived Products, Biomass and Renewable Waste, Petroleum and Petroleum Derived Products, Electricity, and Heat*) to all activities in the *Industrial* sector.

### Transportation -> Energy Services

The Transportation sector is assumed to have an energy efficiency of 25%.

This flow is calculated as 25% of the sum of all inputs (*Natural Gas, Liquefaction, Biomass and Renewable Waste, Petroleum and Petroleum Derived Products, and Electricity*) to all activities in the *Transportation* sector.

## **Conclusion**

The flow charts described in this report are compact depictions of the energy use at the country and world-wide level in 2007. These diagrams will be made available at:

<http://flowcharts.llnl.gov>

## **References**

IEA Data Services: <http://data.iea.org>

Lawrence Livermore National Lab, 2011, Energy Flow Chart. Available at :  
<http://flowcharts.llnl.gov> (Livermore, 2011)