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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 (i.e. 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 listed. Totals may not
equal sum of flows due to statistical differences. 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 listed. 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

- **Domestic**
  - Natural Gas: 24 PJ
  - Biomass: 280 PJ
  - Petroleum: 3800 PJ

- **Exports**
  - Petroleum: 3600 PJ

- **Imports**
  - Petroleum: 79 PJ

- **Power Generation**
  - Wind: 0 PJ
  - Nuclear: 0 PJ
  - Hydro: 12 PJ
  - Solar: 0 PJ
  - Geothermal: 0 PJ
  - Natural Gas: 24 PJ
  - Coal: 0 PJ
  - Biomass: 280 PJ

- **Electricity and Heat**
  - Residential: 230 PJ
  - Commercial: 24 PJ
  - Industrial: 130 PJ
  - Non-Energy: 4.6 PJ
  - Transportation: 65 PJ

- **Rejected Energy**
  - 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 listed. 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

- **Electricity and Heat**: 880 PJ
  - **Residential**: 470 PJ
  - **Commercial**: 140 PJ
  - **Industrial**: 1100 PJ
  - **Non-Energy**: 210 PJ
  - **Transportation**: 680 PJ

- **Natural Gas**: 1600 PJ
- **Coal**: 45 PJ
- **Biomass**: 110 PJ
- **Petroleum**: 1600 PJ
- **Wind**: 0.21 PJ
- **Nuclear**: 79 PJ
- **Hydro**: 110 PJ
- **Geothermal**: 0 PJ

**Imports**: 60 PJ
**Exports**: 95 PJ
**Domestic**: 1600 PJ

**Rejected Energy**: 1500 PJ

Source: LLNL 2011. Date 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 listed. 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

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Australia Energy Flow in 2007: ~5700 PJ

- **Wind**: 9.5 PJ
- **Nuclear**: 0 PJ
- **Hydro**: 52 PJ
- **Solar**: 0.6 PJ

**Electricity and Heat**: 2700 PJ

- **Residential**: 430 PJ
- **Commercial**: 250 PJ
- **Industrial**: 1700 PJ
- **Non-Energy**: 170 PJ
- **Transportation**: 1300 PJ

**Energy Services**: 2100 PJ

**rejected Energy**: 3400 PJ

**Domestic Supplies**:
- **Coal**: 9000 PJ (Imports 1100, Exports 6600)
- **Natural Gas**: 1900 PJ (Imports 190, Exports 750)
- **Petroleum**: 2600 PJ (Imports 1300, Exports 700)
- **Biomass**: 220 PJ

**Imports/Exports**:
- **Total Imports**: 8900 PJ
- **Total Exports**: 790 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 listed. 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

Domestic 55
Imports 340
Exports 110

Natural Gas 400

Imports 170
Domestic 180
Imports 25
Domestic 69
Imports 630

Coal 160

Domestic 56
Imports 140
Exports 110

Biomass 200

Domestic 62
Imports 29
Exports 17

Petroleum 700

Domestic 56
Imports 140
Exports 110

Solar 4.5

Domestic 56
Imports 140
Exports 110

Wind 7.3

Domestic 56
Imports 140
Exports 110

Nuclear 0

Domestic 56
Imports 140
Exports 110

Hydro 130

Domestic 56
Imports 140
Exports 110

Geothermal 1.4

Domestic 56
Imports 140
Exports 110

Electricity and Heat 390

Imports 80
Exports 56

Residential 260

Commercial 100

Industrial 460

Non-Energy 73

Transportation 380

Rejected Energy 650

Energy Services 700

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 listed. 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 listed. 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

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Bangladesh Energy Flow in 2007: ~1100 PJ

Electricity and Heat 320

- Residential 490
- Commercial 13
- Industrial 170
- Non-Energy 110
- Transportation 81

Exports 5.5
Domestic 8.3
Imports 190
Domestic 360
Biomass 360
Coal 15
Natural Gas 520
Geothermal 0
Solar 0
Nuclear 0
Wind 0

- Rejected Energy 510
- Energy Services 480
- Petroleum 200
- Domestic 520
- Natural Gas 520
- Imports 15

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 displayed. 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

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Benin Energy Flow in 2007: ~120 PJ

- Biomass: 74 PJ
- Petroleum: 68 PJ
- Imports: 22 PJ
- Exports: 28 PJ
- Residential: 65 PJ
- Commercial: 11 PJ
- Industrial: 17 PJ
- Non-Energy: 0.17 PJ
- Transportation: 28 PJ
- Electricity and Heat: 1.3 PJ
- Rejected Energy: 52 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

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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 assigned. Totals which are not equal sums 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

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Brazil Energy Flow in 2007: ~10000 PJ

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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 depicted. 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

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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 listed. 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

- **Electrical** and Heat: 4000 PJ
- **Natural Gas**: 7200 PJ
- **Coal**: 2100 PJ
- **Biomass**: 490 PJ
- **Petroleum**: 9300 PJ
- **Wind**: 11 PJ
- **Nuclear**: 1000 PJ
- **Hydro**: 1300 PJ
- **Solar**: 0.084 PJ
- **Geothermal**: 0 PJ
- **Domestic**: 6700 PJ
- **Imports**: 430 PJ
- **Exports**: 3800 PJ
- **Residential**: 1400 PJ
- **Commercial**: 1300 PJ
- **Industrial**: 3700 PJ
- **Non-Energy**: 970 PJ
- **Transportation**: 2500 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 listed. 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

Electricity and Heat 380

Residential 210
Commercial 44
Industrial 440
Non-Energy 71
Transportation 350

Rejected Energy 630
Energy Services 600

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. 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

- **Petroleum**: 17000 PJ
  - Domestic: 7700 PJ
  - Imports: 9400 PJ
- **Biomass**: 8200 PJ
  - Domestic: 8200 PJ
  - Imports: 0.13 PJ
- **Coal**: 57000 PJ
  - Domestic: 55000 PJ
  - Imports: 1500 PJ
- **Natural Gas**: 2600 PJ
  - Domestic: 55000 PJ
  - Imports: 240 PJ
- **Nuclear**: 680 PJ
- **Hydro**: 1800 PJ
- **Wind**: 32 PJ
- **Solar**: 0.42 PJ
- **Geothermal**: 0 PJ
- **Electricity and Heat**: 36000 PJ
  - Residential: 13000 PJ
  - Commercial: 2000 PJ
  - Industrial: 35000 PJ
  - Non-Energy: 4500 PJ
  - Trans-portation: 6800 PJ
- **Rejected Energy**: 40000 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 listed. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further details on how all flows are calculated can be found at http://flowcharts.llnl.gov. LLNL-TR-473098.
Colombia Energy Flow in 2007: ~1200 PJ

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Congo Energy Flow in 2007: ~54 PJ

- **Wind**: 0
- **Nuclear**: 0
- **Hydro**: 1.2
- **Solar**: 0
- **Geothermal**: 0
- **Natural Gas**: 0.76
- **Coal**: 0
- **Biomass**: 30
- **Petroleum**: 500
- **Exports**: 480
- **Imports**: 5.8

**Domestic**

- **Natural Gas**: 0.76
- **Biomass**: 30
- **Petroleum**: 500

**Exports**

- **Petroleum**: 500

**Imports**

- **Natural Gas**: 0.76

**Electricity and Heat**

- **Residential**: 21
- **Commercial**: 0
- **Industrial**: 14
- **Non-Energy**: 0.21
- **Transportation**: 17

**Total Energy Flows**

- **Energy Services**: 29
- **Rejected Energy**: 25

**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 depicted. Totals may not equal the 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 listed. 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.
### Costa Rica Energy Flow in 2007: ~210 PJ

- **Electricity and Heat**
  - Residential: 28 PJ
  - Commercial: 12 PJ
  - Industrial: 46 PJ
  - Non-Energy: 2.1 PJ
  - Transportation: 68 PJ

- **Energy Services**
  - 80 PJ

- **Rejected Energy**
  - 120 PJ

### Sources of Energy
- **Petroleum**
  - Domestic: 35 PJ
  - Imports: 100 PJ
  - 100 PJ

- **Biomass**
  - Domestic: 35 PJ
  - 35 PJ

- **Coal**
  - Domestic: 3.5 PJ
  - 3.5 PJ

- **Natural Gas**
  - 0 PJ

- **Wind**
  - 0.88 PJ

- **Nuclear**
  - 0 PJ

- **Hydro**
  - 24 PJ

- **Geothermal**
  - 45 PJ

- **Geothermal**

### Energy Flows
- **Imports**
  - 0.71 PJ

- **Exports**
  - 0.13 PJ

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

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Croatia Energy Flow in 2007: ~390 PJ

- **Electricity and Heat**: 100 PJ
  - Residential: 72 PJ
  - Commercial: 28 PJ
  - Industrial: 110 PJ
  - Non-Energy: 32 PJ

- **Natural Gas**: 140 PJ
- **Coal**: 29 PJ
- **Biomass**: 15 PJ
- **Petroleum**: 290 PJ

- **Wind**: 0.13 PJ
- **Nuclear**: 0 PJ
- **Hydro**: 15 PJ
- **Geothermal**: 0.13 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 disclosed. Totals may not equal sum of flows due to statistical differences. 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

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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 detailed. 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 listed. 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

- **Wind** 26 PJ
- **Nuclear** 0 PJ
- **Hydro** 0.084 PJ
- **Solar** 0.42 PJ
- **Geothermal** 0.59 PJ
- **Natural Gas** 340 PJ
- **Coal** 200 PJ
- **Biomass** 120 PJ
- **Petroleum** 1000 PJ

Electricity and Heat 370 PJ

- **Residential** 190 PJ
- **Commercial** 83 PJ
- **Industrial** 210 PJ
- **Non-Energy** 13 PJ
- **Transportation** 280 PJ

Imports 200 PJ

Exports 170 PJ

Exports 4.7 PJ

Exports 3.7 PJ

Exports 600 PJ

Exports 38 PJ

Exports 41 PJ

Exports 47 PJ

Exports 60 PJ

Exports 39 PJ

Exports 21 PJ

Exports 3.4 PJ

Imports 96 PJ

Imports 19 PJ

Imports 670 PJ

Imports 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 listed. 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 0.05PJ are not listed. 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 listed. 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

- **Solar**: 0 PJ
- **Nuclear**: 0 PJ
- **Hydro**: 56 PJ
- **Wind**: 3.0 PJ
- **Geothermal**: 0 PJ
- **Natural Gas**: 1900 PJ
- **Coal**: 54 PJ
- **Biomass**: 63 PJ
- **Petroleum**: 1700 PJ
- **Electricity and Heat**: 1000 PJ

**Domestic**
- 1900 PJ
- 0.63 PJ

**Exports**
- 570 PJ
- 0.92 PJ
- 2.9 PJ

**Imports**
- 50 PJ
- 0.92 PJ

**Energy Services**
- 1300 PJ

**Residential**
- 400 PJ

**Commercial**
- 61 PJ

**Industrial**
- 1100 PJ

**Non-Energy**
- 190 PJ

**Transportation**
- 590 PJ

**Rejected Energy**
- 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 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 listed. Totals may not equal the 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 listed. 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 listed. Totals may not equal sum of flows due to statistical differences. Domestic supply includes changes in stocks. For further detail on how all flows are calculated, refer to 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 listed. 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

Electricity and Heat 68

Residential 20
Commercial 9.8
Industrial 32
Non-Energy 1.2
Transportation 17

Natural Gas 3.6
Coal 60
Biomass 5.8
Petroleum 55

Wind 0
Nuclear 0
Hydro 3.7
Solar 0
Geothermal 0.42

Imports 3.6
Exports 0.084
Domestic 54
Imports 6.7
Exports 0.084
Domestic 6.1
Imports 1.5
Exports 11

Energy Services 49
Rejected Energy 77

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 depicted. 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

- Solar: 25
- Nuclear: 0
- Hydro: 25
- Geothermal: 0.67
- Natural Gas: 58
- Coal: 0.55
- Biomass: 17
- Petroleum: 44
- Wind: 0
- Electricity and Heat: 50

Domestic flows:
- Natural Gas: 0.55
- Coal: 0.25
- Biomass: 17
- Petroleum: 2.5

Imports:
- Natural Gas: 58
- Coal: 0.63
- Petroleum: 41

Exports:
- Natural Gas: 1.6
- Coal: 0.38
- Petroleum: 1.9

Energy Services: 65
- Residential: 37
- Commercial: 11
- Industrial: 33
- Non-Energy: 7.1
- Transportation: 31

Rejected Energy: 70

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 listed. 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. 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 listed. 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 illustrated. 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

Domestic 84
Imports 33
Biomass 84
Petroleum 33
Coal 0
Natural Gas 0
Geothermal 0
Solar 0
Hydro 0.55
Nuclear 0
Wind 0

Electricity and Heat 3.8

Residential 63
Commercial 1.8
Industrial 31
Non-Energy 0.29
Transportation 20

Energy Services 71
Rejected Energy 46

Energy 2.5

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 listed. 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, unless otherwise noted. Totals may not equal the sum of flows due to statistical differences. 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 depicted. 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

Solar 0
Nuclear 0
Hydro 30
Solar 0
Geothermal 140
Natural Gas 0
Coal 4.8
Biomass 0.13
Petroleum 44

Electricity and Heat 150

Residential 25
Commercial 5.1
Industrial 54
Non-Energy 8.9
Transportation 23

Imports 4.8
Domestic 0.13
Domestic 0.46
Imports 44

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 depicted. 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, India must be given to the Lawrence Livermore National Laboratory and the U.S. Department of Energy, 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 listed. 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 listed. Totals may not equal sum of flows due to statistical differences. 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 listed. 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 listed. Totals may not equal sum of flows due to statistical differences. 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

**Electricity and Heat**
- Wind: 0.17
- Solar: 0
- Nuclear: 0
- Hydro: 0.59
- Geothermal: 0
- Natural Gas: 0
- Coal: 1.0
- Biomass: 20
- Petroleum: 180

**Energy Demand**
- Residential: 14
- Commercial: 3.8
- Industrial: 69
- Non-Energy: 1.1
- Transportation: 54

**Miscellaneous**
- Imports: 1.0
- Domestic: 20
- Rejected Energy: 120
- Energy Services: 80

**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 listed. 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. 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 the 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

- Solar: 0
- Nuclear: 0
- Hydro: 13
- Geothermal: 37
- Natural Gas: 0
- Wind: 0
- Coal: 2.9
- Biomass: 570
- Petroleum: 180
- Imports: 2.9
- Exports: 0.084
- Domestic: 570
- Imports: 170
- Exports: 16
- Electrical and Heat: 94
- Residential: 390
- Commercial: 2.1
- Industrial: 240
- Non-Energy: 0.84
- Transportation: 81
- Rejected Energy: 320
- Energy Services: 460

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 the 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, unless otherwise stated. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not displayed. Totals may not equal sum of flows due to statistical differences. 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 recreation of it is used, please cite 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 listed. 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 IIA’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 listed. 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

- **Wind**: 0.21
- **Nuclear**: 0
- **Hydro**: 9.9
- **Solar**: 0
- **Geothermal**: 0
- **Natural Gas**: 57
- **Coal**: 4.6
- **Biomass**: 66
- **Petroleum**: 87
- **Electricity and Heat**: 54

**Domestic**
- 1.8
- 55
- 4.0
- 66
- 1.3
- 1.3
- 80

**Imports**
- 0.59
- 0.21
- 55
- 4.0

**Exports**
- 0.084
- 0.084
- 0.084
- 0.084
- 0.084
- 0.084
- 0.50

**Residential**: 61
**Commercial**: 29
**Industrial**: 38
**Non-Energy**: 4.6
**Transportation**: 64

**Rejected Energy Services**: 100

**Energy Services**: 100

**Total**
- 21
- 17
- 64
- 17
- 21

**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 listed. 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 IIA’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 listed. Totals may not equal the 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 listed. 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 listed. Totals may not equal sum of flows due to statistical differences. 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

- **Electricity and Heat**: 23 PJ
- **Residential**: 24 PJ
- **Commercial**: 4.8 PJ
- **Industrial**: 45 PJ
- **Non-Energy**: 0.55 PJ
- **Transportation**: 110 PJ

**Sources and Credits**

- Lawrence Livermore National Laboratory
- IAEA's Extended World Energy Balances
- Source: LLNL 2011
- All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not included.
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 displayed. 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 listed. 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 displayed. 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 listed. Totals may not equal sum of flows due to statistical differences. 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

- **Wind:** 1.0 PJ
- **Nuclear:** 0 PJ
- **Hydro:** 4.8 PJ
- **Solar:** 0 PJ
- **Geothermal:** 0 PJ
- **Natural Gas:** 23 PJ
- **Coal:** 120 PJ
- **Biomass:** 19 PJ
- **Petroleum:** 480 PJ
- **Electricity and Heat:** 200 PJ

**End Use Categories:**
- **Residential:** 100 PJ
- **Commercial:** 11 PJ
- **Industrial:** 190 PJ
- **Non-Energy:** 14 PJ
- **Transportation:** 160 PJ

**Energy Services:** 270 PJ

**Rejected Energy:** 330 PJ

**Total:** ~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 listed. 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. Neither assumes the work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not listed. Totals may not equal the 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.

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 listed. 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 listed. 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 depicted. 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 listed. 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

Electricity and Heat 260

- Residential 29
- Commercial 14
- Industrial 220
- Non-Energy 130
- Trans-Portation 85

Natural Gas 930

- Domestic 850
- Exports 450

Petroleum 1600

- Domestic 1500
- Exports 1400

Biomass 0

- Domestic 0
- Exports 450

Coal 0

- Domestic 0

Geothermal 0

- Domestic 0

Solar 0

- Domestic 0

Wind 0

- Domestic 0

Sources:
- Lawrence Livermore National Laboratory
- IEA's Extended World Energy Balances

Note: Data is 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 listed. 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 displayed. Totals may not equal the sum of flows due to statistical differences. Domestic supply includes changes in stocks. Further details 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 displayed. 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 sold, cited, or distributed to the public by anyone other than Lawrence Livermore National Laboratory and the U.S. Department of Energy, under whose auspices the work was performed, appropriate credit must be given. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not listed. Totals may not equal the 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

- Solar: 0
- Nuclear: 0
- Hydro: 31
- Geothermal: 370
- Wind: 0.21
- Natural Gas: 130
- Coal: 270
- Biomass: 320
- Petroleum: 710
- Electricity and Heat: 740

Energy Services: 640

Residential: 270
Commercial: 84
Industrial: 390
Non-Energy: 14
Transportation: 420
Rejected Energy: 1100

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 listed. 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
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. Details 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 displayed. 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

- Residential 140
- Commercial 23
- Industrial 190
- Non-Energy 13
- Transportation 80
- Energy Services 270
- Rejected Energy 390

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 listed. 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, needs to 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 listed. 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. 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

Electricity and Heat 2500

Residential 680
Commercial 200
Industrial 1700
Non-Energy 110
Transportation 810

Liquefaction 740

Energy Services 2100
Rejected Energy 3400

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 listed. 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. 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 listed. 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. Neither source accepts the work performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not listed. 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 displayed. 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 this work was performed. All quantities are rounded to 2 significant digits and annual flows of less than 0.05 PJ are not labeled. 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 listed. Totals may not equal sum of flows due to statistical differences. 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 listed. 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 displayed. 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 depicted. Totals may not equal the 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

- Natural Gas: 1200 PJ
- Petroleum: 600 PJ
- Coal: 0 PJ
- Biomass: 0.50 PJ
- Solar: 0 PJ
- Nuclear: 0 PJ
- Wind: 0 PJ
- Hydro: 0 PJ
- Geothermal: 0 PJ
- Transportation: 45 PJ
- Non-Energy: 340 PJ
- Industrial: 190 PJ
- Commercial: 2.6 PJ
- Residential: 12 PJ
- Energy Services: 170 PJ
- Rejected Energy: 150 PJ

Trinidad and Tobago Energy Flow

Source: LLNL 2011. Data is based on IEA's Extended World Energy Balances. If this information or a reproduction of it is used, it 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 displayed. 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

- **Solar**: 0.17
- **Nuclear**: 0
- **Hydro**: 0.17
- **Wind**: 0.17
- **Natural Gas**: 150
- **Coal**: 0
- **Biomass**: 51
- **Petroleum**: 380

**Electricity and Heat**: 140

- **Residential**: 80
- **Commercial**: 26
- **Industrial**: 100
- **Non-Energy**: 4.7
- **Transportation**: 77

**Rejected Energy**: 210

**Energy Services**: 170

**Domestic**: 81
**Imports**: 72
**Exports**: 200

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 listed. 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

- Solar: 12 PJ
- Nuclear: 0 PJ
- Hydro: 130 PJ
- Geothermal: 44 PJ
- Wind: 1.3 PJ

Electricity and Heat: 1400 PJ

- Residential: 870 PJ
- Commercial: 270 PJ
- Industrial: 1300 PJ
- Non-Energy: 250 PJ
- Transportation: 750 PJ

Natural Gas: 1300 PJ

- Imports: 1300 PJ
- Exports: 1.1 PJ
- Domestic: 620 PJ

Coal: 1200 PJ

- Imports: 610 PJ
- Exports: 1.0 PJ
- Domestic: 210 PJ

Biomass: 210 PJ

- Imports: 1600 PJ
- Domestic: 210 PJ
- Exports: 1100 PJ

Petroleum: 1600 PJ

- Imports: 1600 PJ
- Exports: 250 PJ

Energy Services: 2000 PJ

- Rejected Energy: 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 listed. 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.
Ukraine Energy Flow in 2007: ~5900 PJ

Source: LLNL 2011. Date 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 displayed. Totals may not equal sum of flows due to statistical differences. 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 listed. 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

Domestic
- Coal 1600
- Natural Gas 3800
- Petroleum 7000
- Biomass 150
- Solar 0
- Hydro 18
- Nuclear 690
- Wind 19
- Geothermal 0
- Weather 0

Imports
- Natural Gas 1100
- Coal 1200
- Biomass 16
- Petroleum 3500

Exports
- Coal 24
- Natural Gas 400
- Biomass 4.5
- Petroleum 3500

Electricity and Heat 3500
- Residential 1700
- Commercial 670
- Industrial 2000
- Non-Energy 360
- Transportation 2500

Rejected Energy 5300

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

Electricity and Heat 40000

Residential 11000
Commercial 8600
Industrial 18000
Non-Energy 6700
Transportation 29000

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.
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 listed. 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 listed. Totals may not equal sum of flows due to statistical differences. Further detail on how all flows are calculated can be found at http://flowcharts.llnl.gov.
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 listed. 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 listed. 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. 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 listed. Totals may not equal the 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 listed. 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

Solar 200
Nuclear 30000
Hydro 11000
Geothermal 2100
Wind 630
Natural Gas 110000
Coal 130000
Biomass 48000
Petroleum 170000

Electricity and Heat 190000

Residential 82000
Commercial 28000
Industrial 150000
Non-Energy 32000
Transportation 82000

Rejected Energy 250000
Energy Services 210000

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

**Geothermal:**
- Geothermal

**Natural Gas:**
- Natural Gas

**Biomass and Renewable Waste:**
- Renewable municipal waste
- Primary solid biomass
- Biogas
- 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

**Wind:**
- Wind

**Nuclear:**
- Nuclear

**Hydro:**
- Hydro

**Solar:**
- Solar photovoltaic
- Solar thermal
<table>
<thead>
<tr>
<th>Economic Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial:</strong></td>
</tr>
<tr>
<td>(includes energy extraction and fuel production)</td>
</tr>
<tr>
<td>Heat pumps</td>
</tr>
<tr>
<td>Charcoal production plants</td>
</tr>
<tr>
<td>Gas-to-liquids (GTL) plants</td>
</tr>
<tr>
<td>Electric boilers</td>
</tr>
<tr>
<td>Non-specified (transformation)</td>
</tr>
<tr>
<td>Nuclear industry</td>
</tr>
<tr>
<td>Chemical heat for electricity production</td>
</tr>
<tr>
<td>Coal mines</td>
</tr>
<tr>
<td>Charcoal production plants</td>
</tr>
<tr>
<td>Blast furnaces</td>
</tr>
<tr>
<td>Oil and gas extraction</td>
</tr>
<tr>
<td>Non-specified (energy)</td>
</tr>
<tr>
<td>Gas works</td>
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<tr>
<td>Blast furnaces</td>
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<tr>
<td>Iron and steel</td>
</tr>
<tr>
<td>Coke ovens</td>
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<tr>
<td>Gas works</td>
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<tr>
<td>Chemical and petrochemical</td>
</tr>
<tr>
<td>Patent fuel plants</td>
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<tr>
<td>Gasification plants for biogas</td>
</tr>
<tr>
<td>Non-ferrous metals</td>
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<tr>
<td>BKB plants</td>
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<tr>
<td>Coke ovens</td>
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<tr>
<td>Non-metallic minerals</td>
</tr>
<tr>
<td>Petroleum refineries</td>
</tr>
<tr>
<td>Patent fuel plants</td>
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<tr>
<td>Transport equipment</td>
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<tr>
<td>Petrochemical industry</td>
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<tr>
<td>BKB plants</td>
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<tr>
<td>Machinery</td>
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<tr>
<td>Coal liquefaction plants</td>
</tr>
<tr>
<td>Petroleum refineries</td>
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<tr>
<td><strong>Industrial (cont.):</strong></td>
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<tr>
<td>Mining and quarrying</td>
</tr>
<tr>
<td>Gas-to-liquids (GTL) plants</td>
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<tr>
<td>Coal liquefaction plants</td>
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<tr>
<td>Food and tobacco</td>
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<tr>
<td>For blended natural gas</td>
</tr>
<tr>
<td>Liquefaction (LNG) / regasification plants</td>
</tr>
<tr>
<td>Paper, pulp and print</td>
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<tr>
<td>Agriculture/forestry</td>
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<tr>
<td>Construction</td>
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<tr>
<td>Wood and wood products</td>
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<tr>
<td>Fishing</td>
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<tr>
<td>Textile and leather</td>
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<tr>
<td>Non-specified (industry)</td>
</tr>
<tr>
<td>Non-specified (other)</td>
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<tr>
<td><strong>Non-Energy:</strong></td>
</tr>
<tr>
<td>(conversion of energy feedstock to durable products)</td>
</tr>
<tr>
<td>Non-energy use</td>
</tr>
<tr>
<td>Non-energy use industry/transformation/energy</td>
</tr>
<tr>
<td>Non-energy use in transport</td>
</tr>
<tr>
<td><strong>Electricity and Heat Production:</strong></td>
</tr>
<tr>
<td>Main activity producer electricity plants</td>
</tr>
<tr>
<td>Autoproducer electricity plants</td>
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<tr>
<td>Main activity producer CHP plants</td>
</tr>
<tr>
<td>Autoproducer CHP plants</td>
</tr>
<tr>
<td>Main activity producer heat plants</td>
</tr>
<tr>
<td>Autoproducer heat plants</td>
</tr>
<tr>
<td>Own use in electricity, CHP and heat plants</td>
</tr>
<tr>
<td>Used for pumped storage</td>
</tr>
<tr>
<td>Distribution losses</td>
</tr>
<tr>
<td><strong>Residential:</strong></td>
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<tr>
<td>Residential</td>
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<tr>
<td><strong>Commercial:</strong></td>
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<tr>
<td>Commercial and public services</td>
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<tr>
<td><strong>Transportation:</strong></td>
</tr>
<tr>
<td>Domestic aviation</td>
</tr>
<tr>
<td>Road</td>
</tr>
<tr>
<td>Rail</td>
</tr>
<tr>
<td>Pipeline transport</td>
</tr>
<tr>
<td>Domestic navigation</td>
</tr>
<tr>
<td>Non-specified (transport)</td>
</tr>
<tr>
<td>International marine bunkers</td>
</tr>
<tr>
<td>International aviation bunkers</td>
</tr>
</tbody>
</table>
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\textsuperscript{1}

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.

\textsuperscript{1} 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](http://data.iea.org)