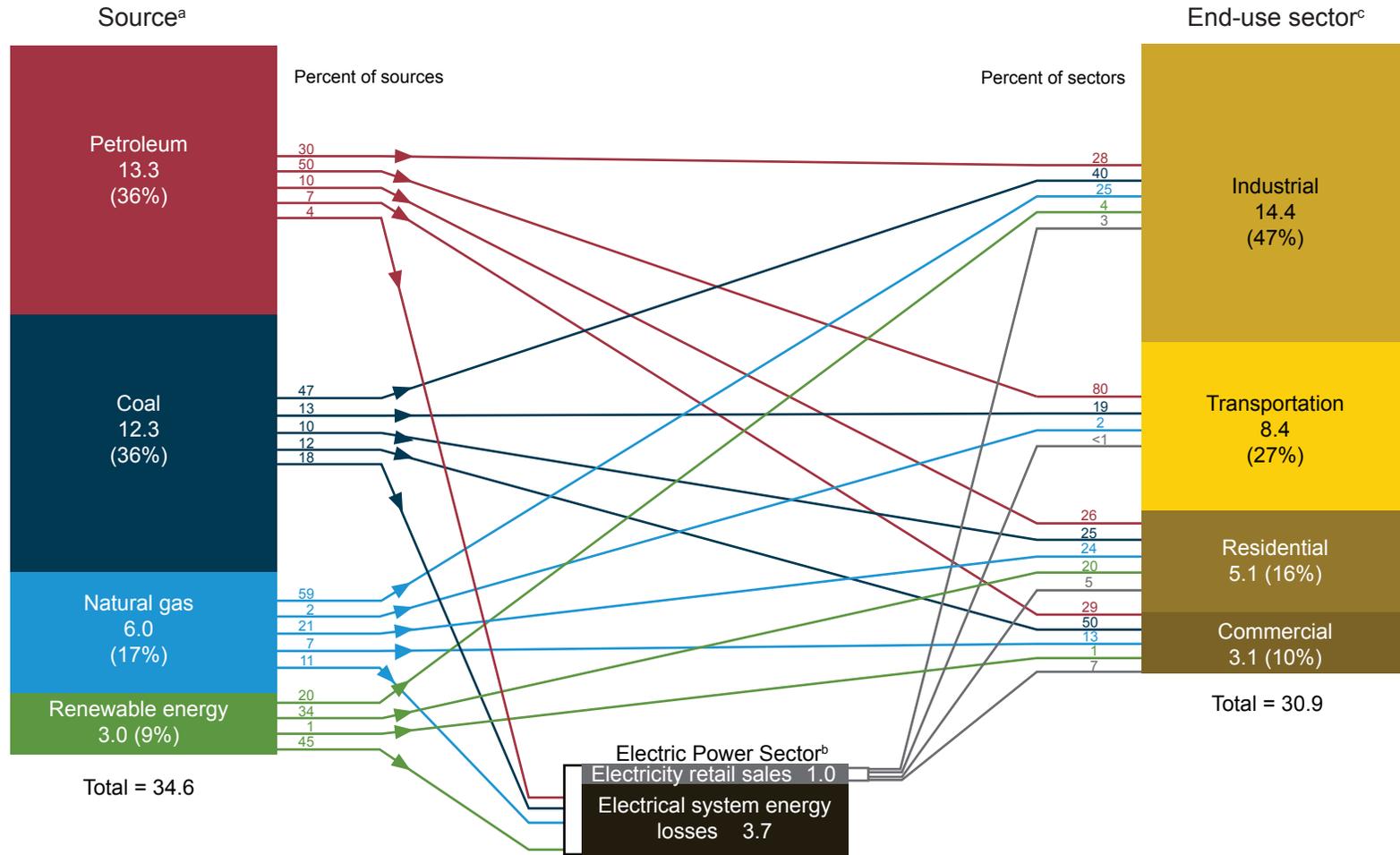


# U.S. primary energy consumption by source and sector, 1950

(Quadrillion Btu)



<sup>a</sup> Primary energy consumption. Each energy source is measured in different physical units and converted to common British thermal units (Btu). See U.S. Energy Information Administration (EIA), *Monthly Energy Review*, Appendix A. Noncombustible renewable energy sources are converted to Btu using the "Fossil Fuel Equivalency Approach", see EIA's *Monthly Energy Review*, Appendix E.

<sup>b</sup> The electric power sector includes electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Energy consumed by these plants reflects the approximate heat rates for electricity in EIA's *Monthly Energy Review*, Appendix A. The total includes the heat content of electricity net imports, not shown separately. Electrical system energy losses are calculated as the primary energy consumed by the electric power sector minus the heat

content of electricity retail sales. See Note 1, "Electrical System Energy Losses," at the end of EIA's *Monthly Energy Review*, Section 2.

<sup>c</sup> End-use sector consumption of primary energy and electricity retail sales, excluding electrical system energy losses from electricity retail sales. Industrial and commercial sectors consumption includes primary energy consumption by combined-heat-and-power (CHP) and electricity-only plants contained within the sector.

Note: Sum of components may not equal total due to independent rounding. All source and end-use sector consumption data include other energy losses from energy use, transformation, and distribution not separately identified. See "Extended Chart Notes" on next page.

Sources: EIA, *Monthly Energy Review* (April 2019), Tables 1.3, 1.4a, 1.4b, and 2.1-2.6.

## Extended Chart Notes

The U.S. Energy Information Administration (EIA) *U.S. energy consumption by source and sector* chart illustrates energy that is consumed (used) in the United States. The data are from EIA's [Monthly Energy Review](#) (MER) and include the relatively small amount of electricity net imports, not shown separately. The chart does not show energy production, nor the losses associated with energy production.

### Primary energy consumption by Source:

Energy sources are measured in different physical units: liquid fuels in barrels or gallons, natural gas in cubic feet, coal in short tons, and electricity in kilowatthours. EIA converts each source into common British thermal units (Btu) to allow comparison among different types of energy. See [MER Appendices A and E](#) for further explanation.

**Petroleum:** Equal to petroleum products supplied. Petroleum products are obtained from the processing of crude oil, natural gas, and other hydrocarbon compounds. Products include unfinished oils, hydrocarbon gas liquids, aviation gasoline, motor gasoline, jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products. Petroleum excludes biofuels that have been blended with petroleum products.

**Natural gas:** A gaseous mixture of hydrocarbon compounds, primarily methane, formed deep beneath the earth's surface over millions of years from the remains of plants and animals, chemicals, heat, and pressure. Natural gas excludes supplemental gaseous fuels.

**Coal:** A combustible black or brownish-black sedimentary rock with a high amount of carbon and hydrocarbons formed from plant remains that have been compacted, hardened, chemically altered, and metamorphosed by heat and pressure over geologic time. Coal includes a relatively small amount of coal coke imports.

**Renewable energy:** Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy includes biomass, conventional hydroelectric power, geothermal, solar, and wind energy.

**Nuclear electric power:** Electricity generated by the use of the thermal energy released from the fission of nuclear fuel in a reactor.

### Electric power sector:

**Electricity retail sales:** The amount of electricity sold to customers purchasing electricity for their own use and not for resale.

**Electrical system energy losses:** The amount of energy lost during the generation, transmission, and distribution of electricity, including plant and unaccounted-for uses. Electrical system energy losses are calculated as the difference between total primary consumption by the electric power sector (see MER Table 2.6) and the total energy content of electricity retail sales (MER Tables 7.6 and A6).

Most electrical system energy losses occur in the generation of electricity at electric power plants, which use primary energy to turn electric generators. This conversion loss is a thermodynamically necessary feature of steam-electric and combustion (gas) turbines. Other losses include power plant use of electricity, transmission and distribution of electricity from power plants to end-use consumers, heat produced from combined heat and power (CHP) plants, and unaccounted-for electricity. See the endnotes of [MER Section 2](#) for further explanation.

Another part of electrical system energy losses is a result of imputing fossil energy equivalent inputs for noncombustible renewable energy sources (hydroelectric, geothermal, solar thermal, photovoltaic, and wind energy). See [MER Appendix E](#) for further explanation.

### End-use sectors:

Total energy consumption by end-use sectors in this chart exclude electrical system energy losses and differ from the totals published in MER Table 2.1, which allocates electrical system energy losses proportionally to the amount of electricity retail sales to each end-use sector.

**Transportation:** Includes energy used by automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse forklifts) are classified in the sector of their primary use. Also includes natural gas used in the operation of natural gas pipelines.

**Industrial:** Includes energy consumed for manufacturing (NAICS codes 31-33); agriculture, forestry, fishing, and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); construction (NAICS code 23); and generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities.

**Residential:** Includes energy used for space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances in the living quarters of private households.

**Commercial:** Includes energy consumed by businesses; federal, state, and local governments; other private and public organizations, such as religious, social, or fraternal groups; institutional living quarters; sewage treatment facilities; and generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.

### Other energy losses:

Similar to electrical system energy losses, there are also other energy losses in energy production, distribution, and consumption. However, these losses are not shown separately in the chart because data are not available for EIA to estimate these losses.

All uses of primary energy have efficiency losses, in the form of heat, when energy is converted to do useful work. Examples include when motor gasoline is burned to move vehicles, when natural gas is burned to heat homes, or in any other use of combusted fuels. There are also losses in the transformation of one form of energy to another form of energy. For example, there are transformation losses in the process of refining crude oil into usable petroleum products, processing natural gas into marketable dry gas, and in the process of transforming energy from the sun into usable energy by solar panels. The [Lawrence Livermore National Laboratory](#) has published estimates of primary energy losses by end-use sector by applying an end use efficiency factor to EIA's *Monthly Energy Review* consumption data.