Energy Classifications

Introduction:

Energy is one of the major inputs for the economic development of any country. In the case of the developing countries, the energy sector assumes critical importance in view of the ever-increasing energy needs, requiring huge investments to meet them.

The consumption of energy is increasing at a fast pace while available resources remain limited. The global need for energy is increasing on an average by about 2.4% every year. Out of the total amount of primary energy, over 85% comes from fossil fuels. The current consumption of fossil fuels, particularly oil, is not sustainable in the long term.

Energy consumption also has a significant impact on our natural environment. There is clear evidence that climate change is caused by human activity, mostly related to the use of energy.

Energy, that we use, can be classified into several types based on the following criteria:

- Primary energy and secondary energy
- Commercial and non commercial energy
- Renewable and non-renewable energy

Energy Classifications

Primary and Secondary energy:

Primary energy refers to all types of energy extracted or captured directly from natural resources. Primary energy can be further divided into two distinctive groups:

- Renewable (solar, wind, geothermal, tidal, biomass, hydel etc.)
- Non-renewable (fossil fuels: crude oil and its products, coal, natural gas, nuclear, etc.)

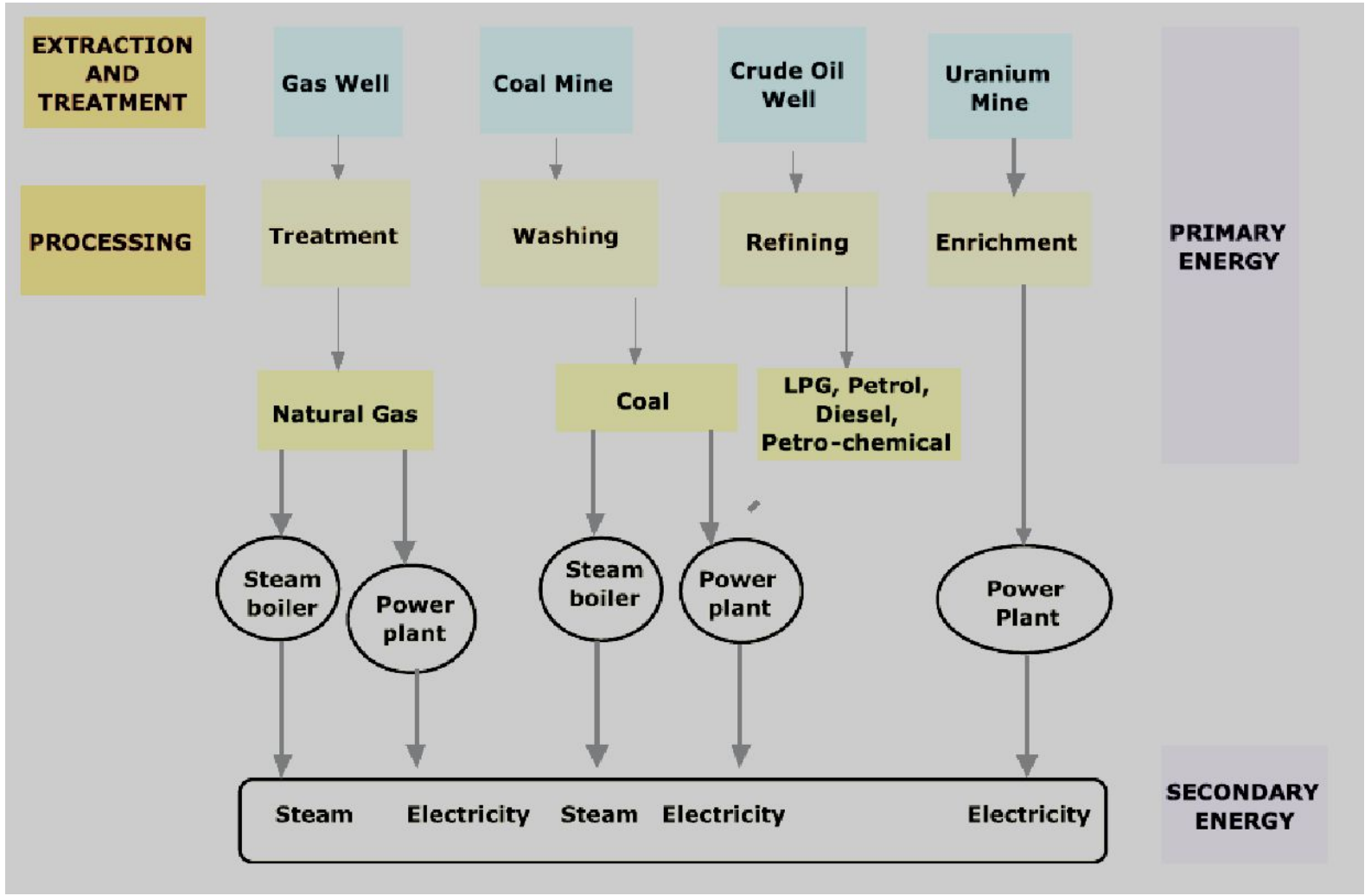
The primary energy content of all fuels is generally expressed in terms of toe (tonne of oil equivalent) and is based the following conversion factor.

One tonne of oil equivalent (toe) = 1 x 10^7 kcal = 11630 kWh = 41868 MJ

Primary energy sources are mostly converted in industrial utilities into secondary energy sources; for example coal, oil or gas converted into steam and electricity.

Energy Classifications

Major Primary and Secondary energy sources:



Energy Classifications

Commercial Energy

Energy that is available in the market for a definite price is known as commercial energy. No matter what the method of energy production is, whether it is from fossil fuels, nuclear or renewable sources, any form of energy used for commercial purposes constitutes commercial energy.

Examples: Electricity, lignite, coal, oil, natural gas etc.

Non-Commercial Energy

Any kind of energy which is sourced within a community and its surrounding area, and which is not normally traded in the commercial market is termed as non-commercial energy.

Examples: Firewood and agro waste in rural areas, solar energy for water heating, electricity generation, and for drying grain, fish and fruits; animal power for transport, threshing, lifting water for irrigation, crushing sugarcane etc.; wind energy for lifting water and electricity generation.

Energy Classifications

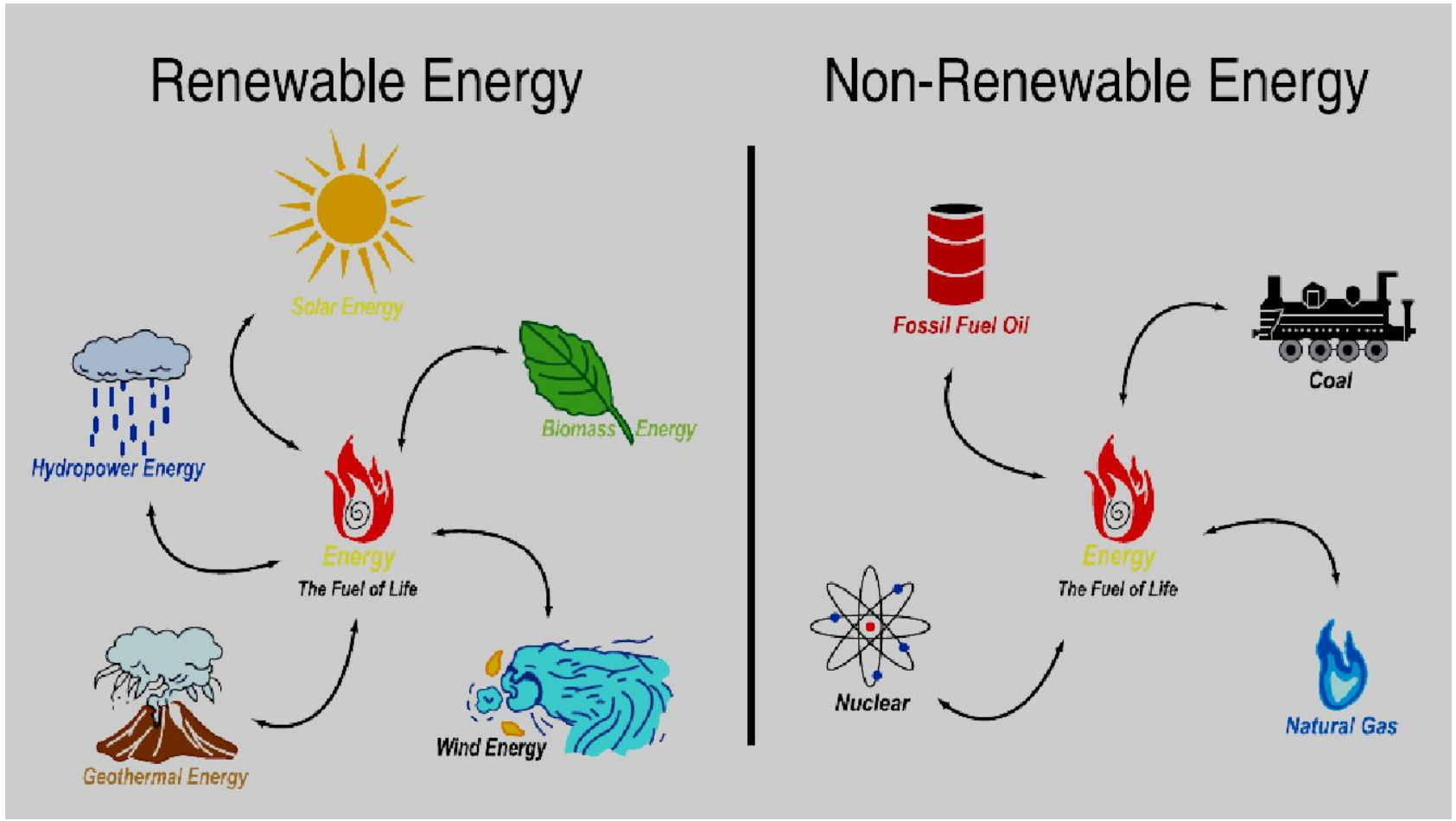
Renewable and Non-renewable energy

Renewable energy is the energy obtained from natural sources which are essentially inexhaustible. Examples of renewable resources include wind power, solar power, geothermal energy, tidal power and hydroelectric power. The most important feature of renewable energy is that itcan be harnessed without the release of harmful pollutants.

A non-renewable resource is a natural resource which cannot be produced, grown, replenished, or used on a scale which can sustain its consumption rate. These resources often exist in a fixed amount, or are consumed much faster than nature can create them. Natural resources such as coal, oil and natural gas take millions of years to form and cannot be replaced as fast as they are being consumed now. These resources will deplete with time.

Energy Classifications

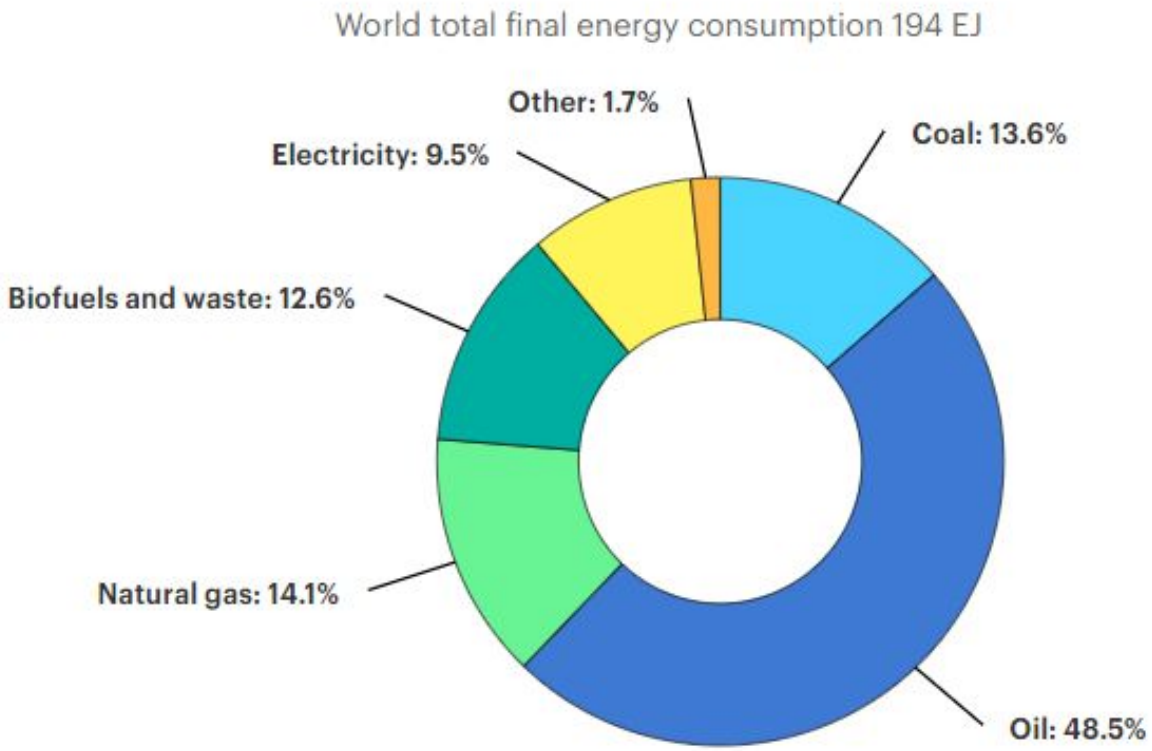
Renewable and Non-renewable energy



Sectorial Energy consumption:

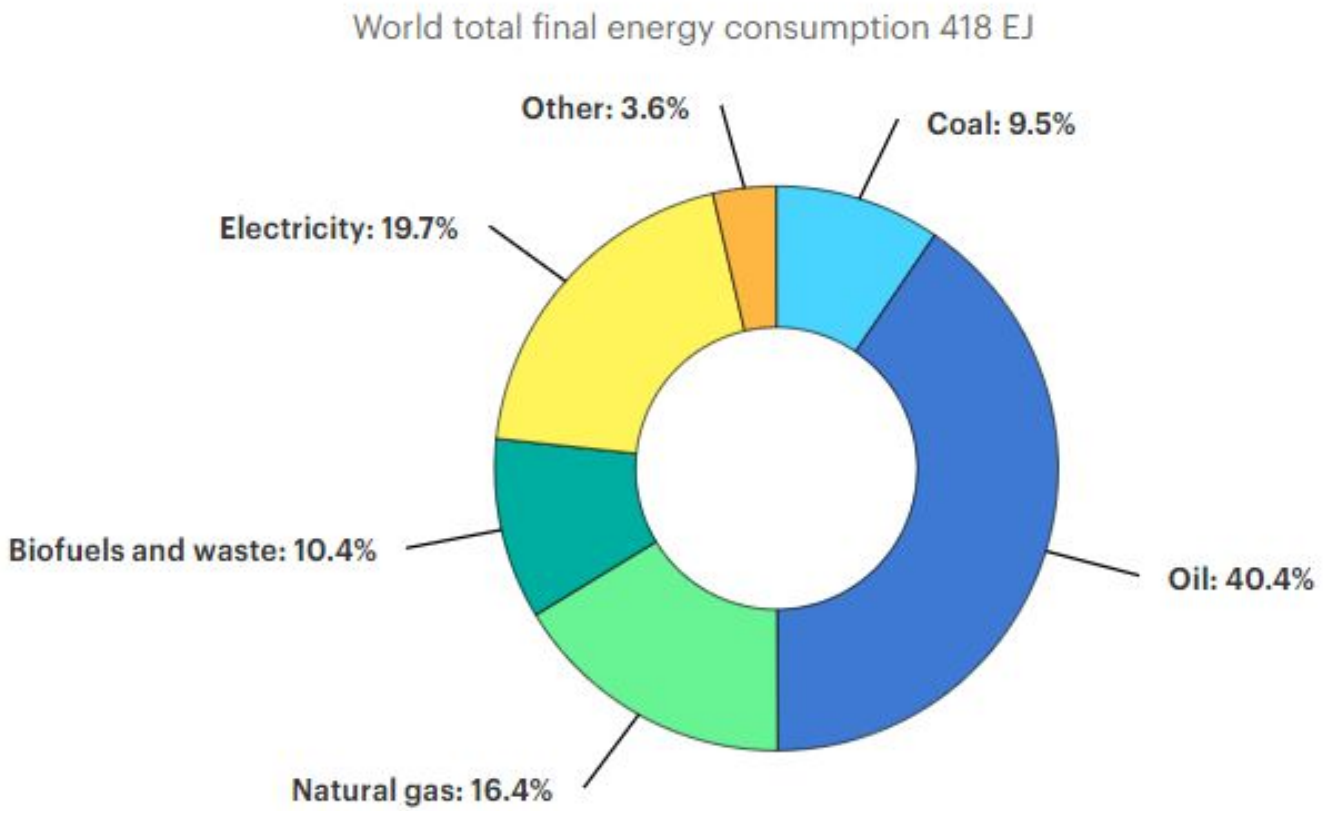
World total final consumption by source – 1973

Exajoule (EJ): 1 EJ = 10^{18} J



Sectorial Energy consumption:

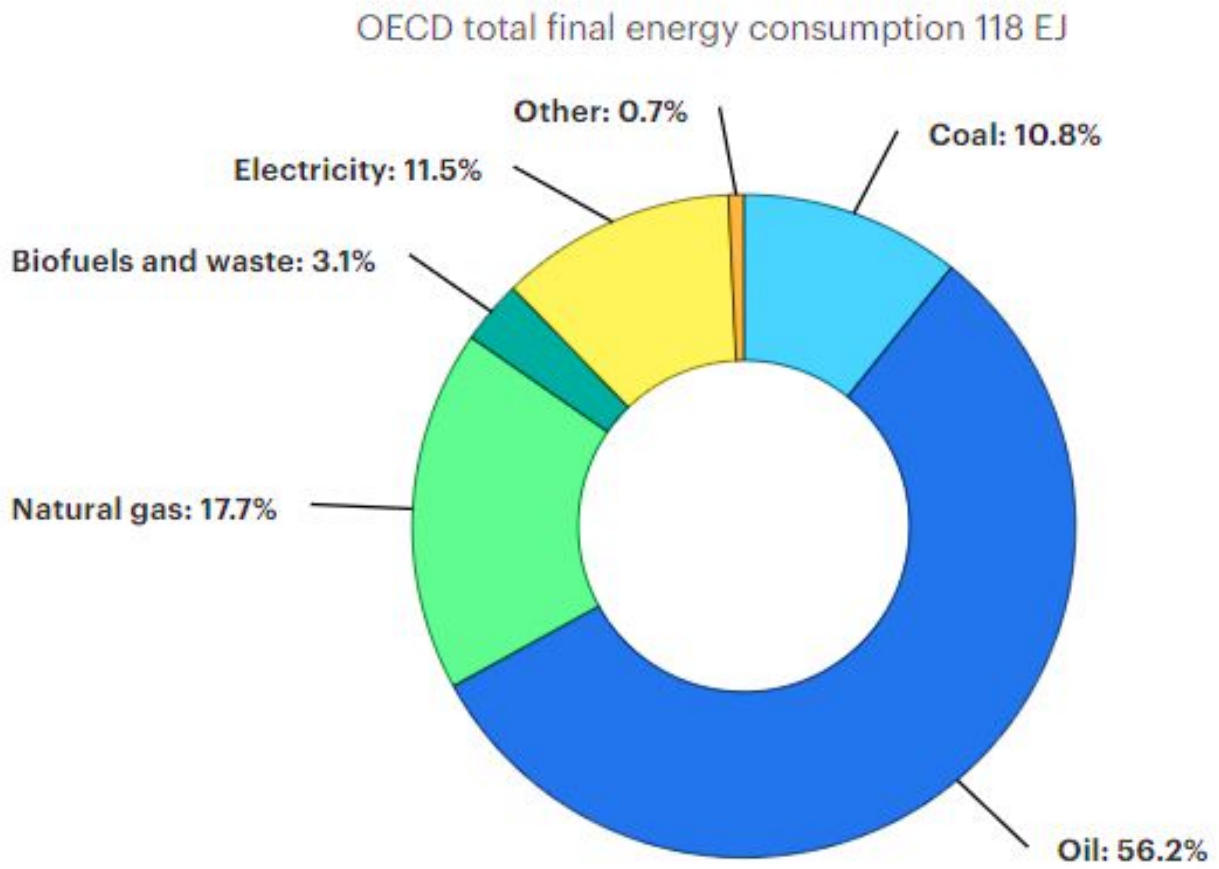
World total final consumption by source - 2019



Sectorial Energy consumption:

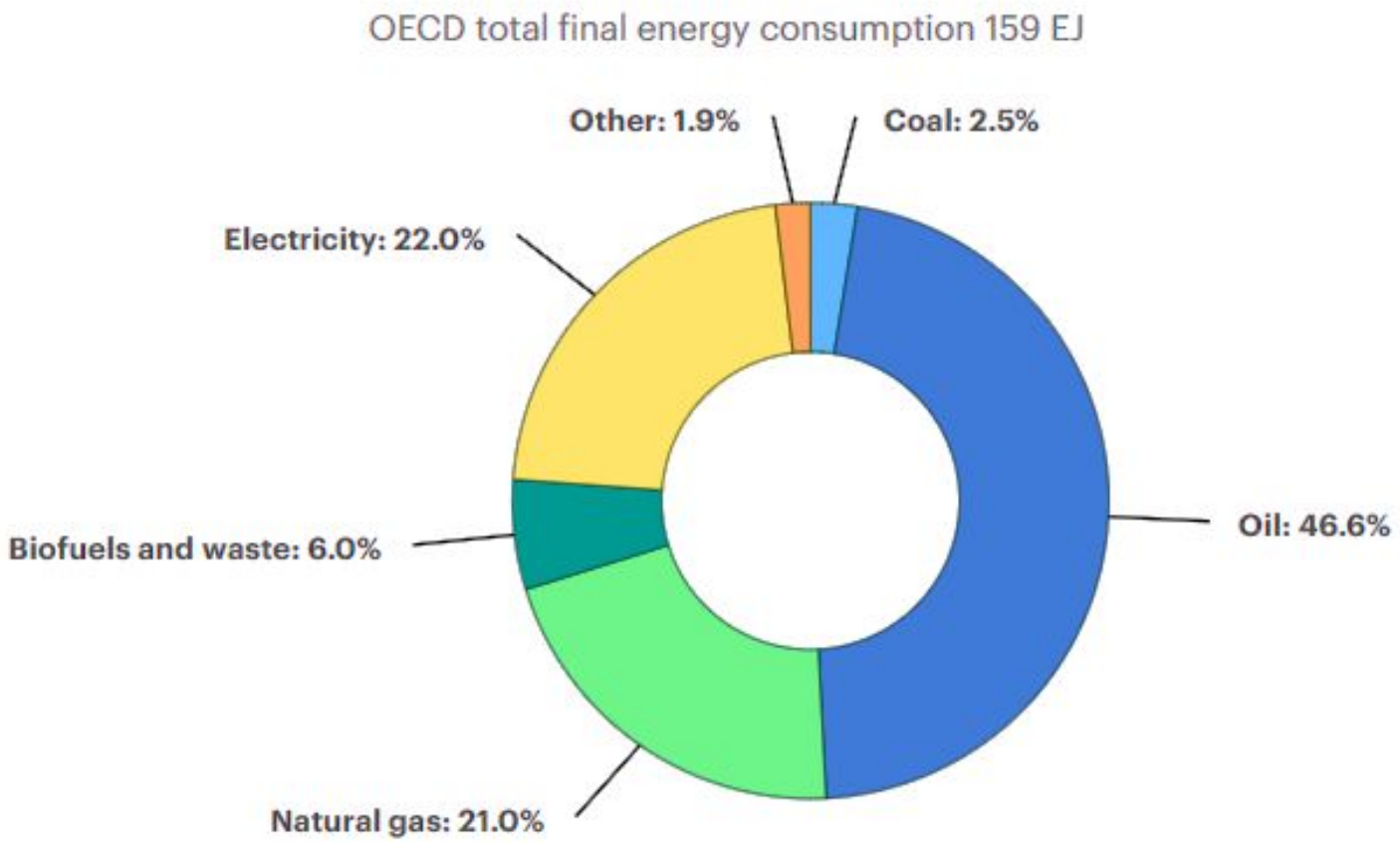
OECD total final consumption by source – 1973

OECD - Organization for Economic Cooperation and Development (OECD)



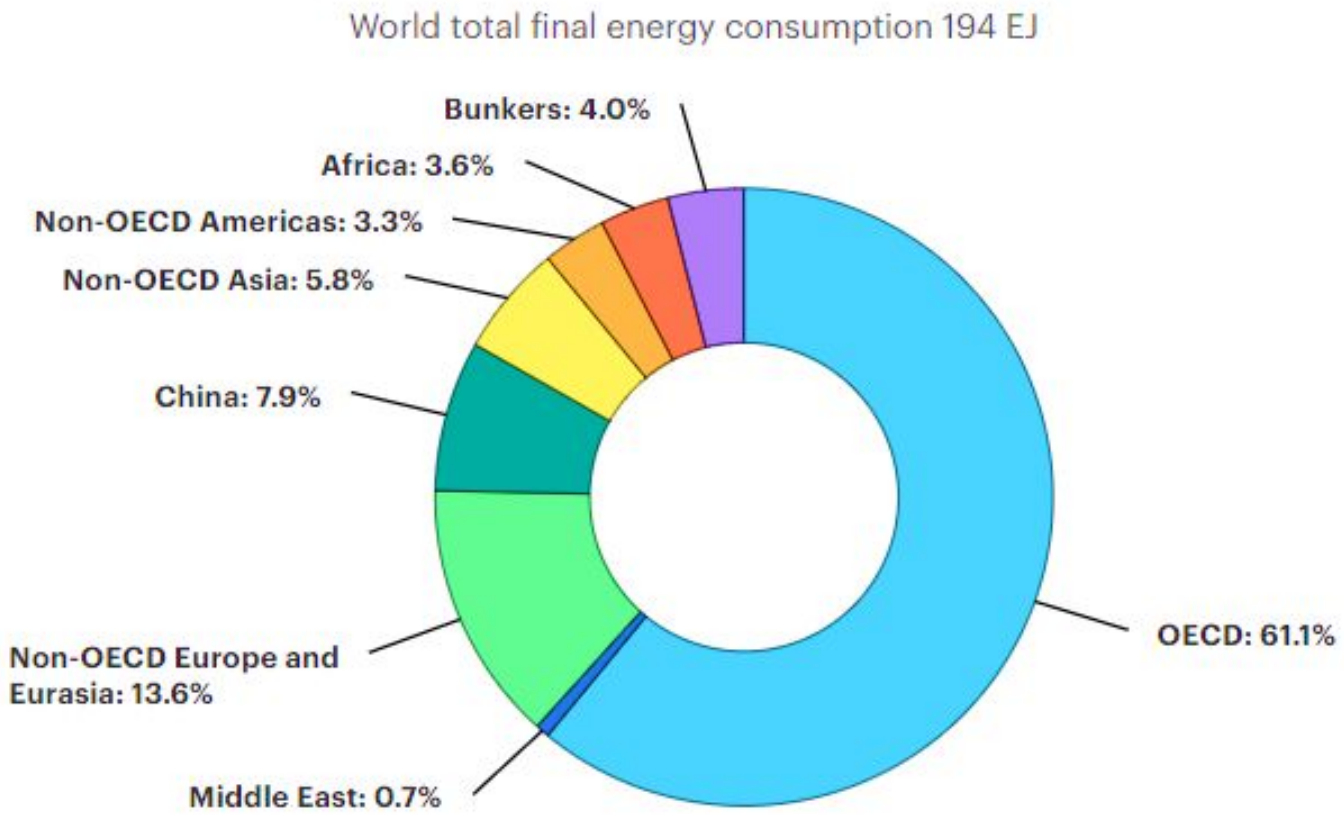
Sectorial Energy consumption:

OECD total final consumption by source - 2019



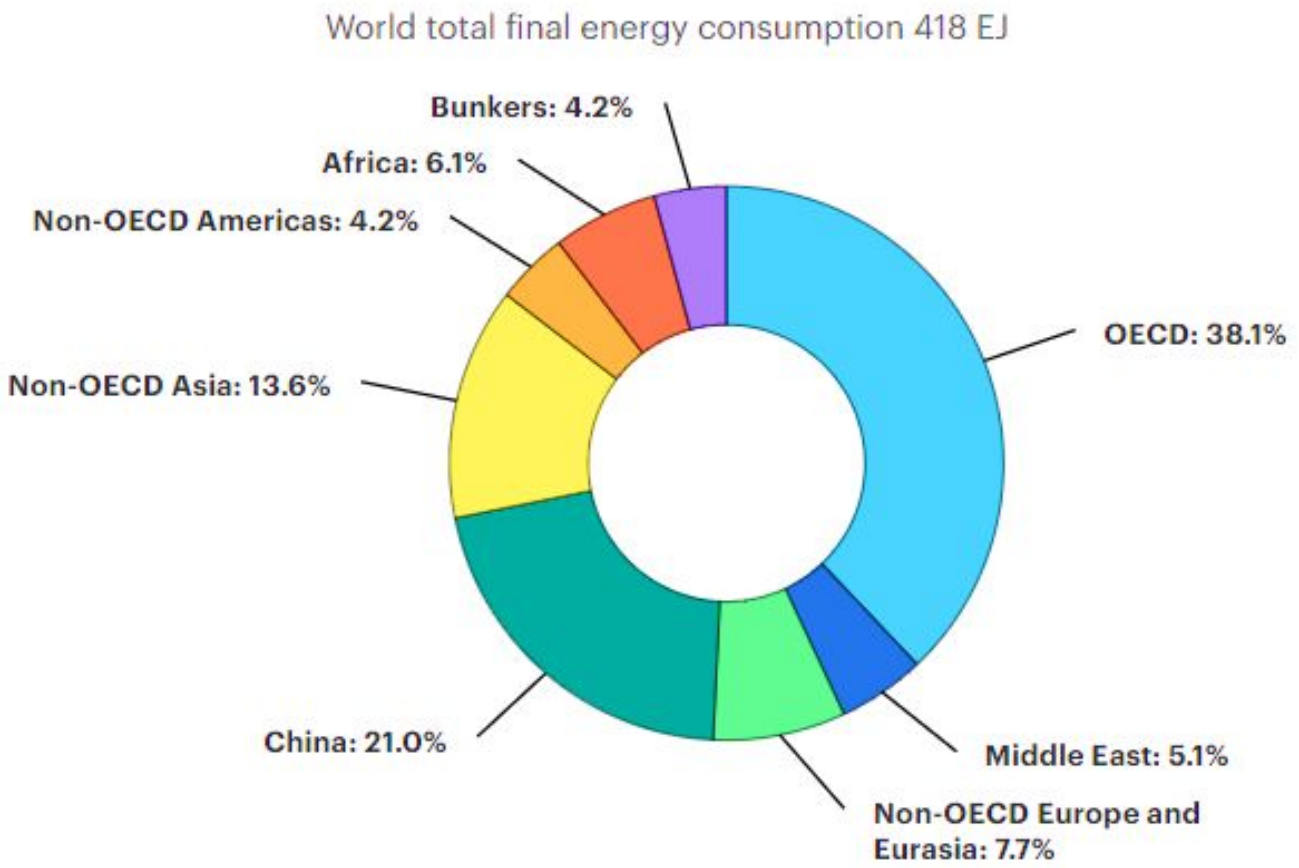
Sectorial Energy consumption:

World total final consumption by region - 1973



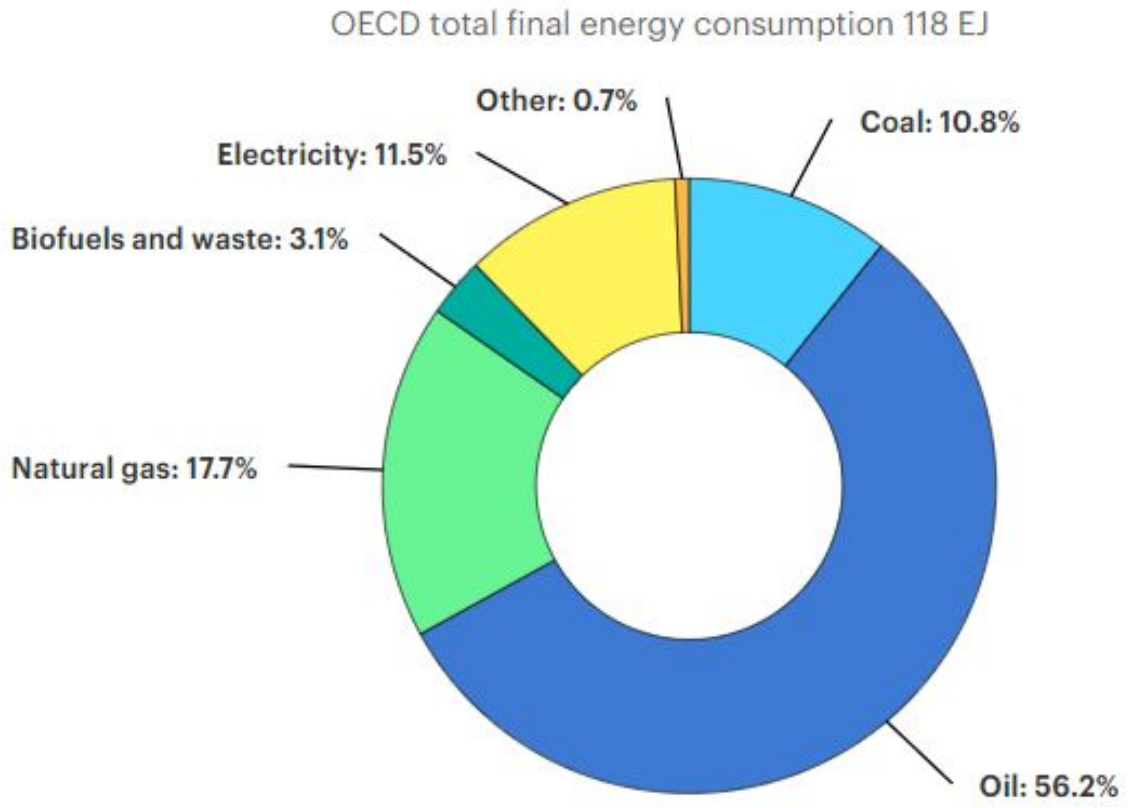
Sectorial Energy consumption:

World total final consumption by region - 2019



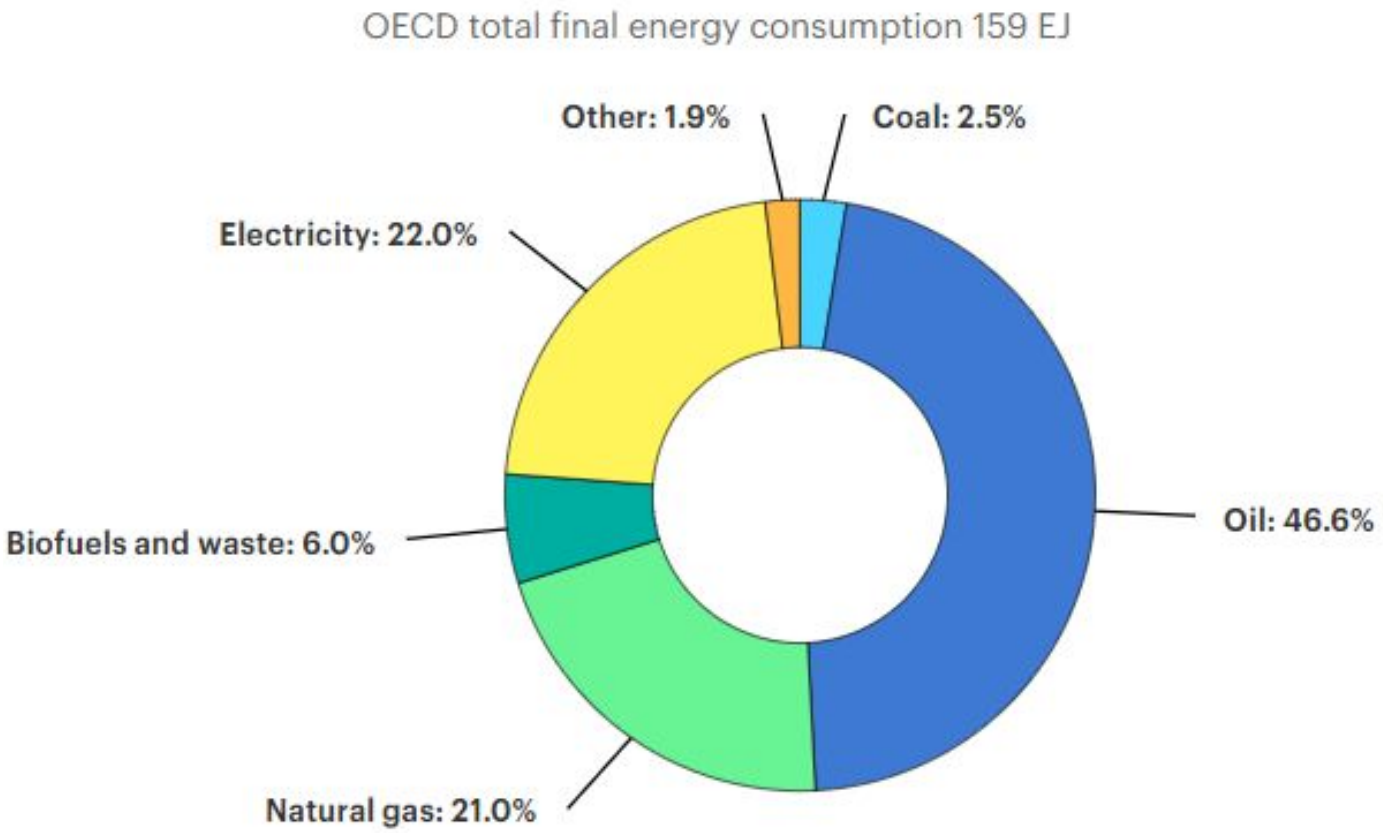
Sectorial Energy consumption:

OECD total final consumption by source - 1973



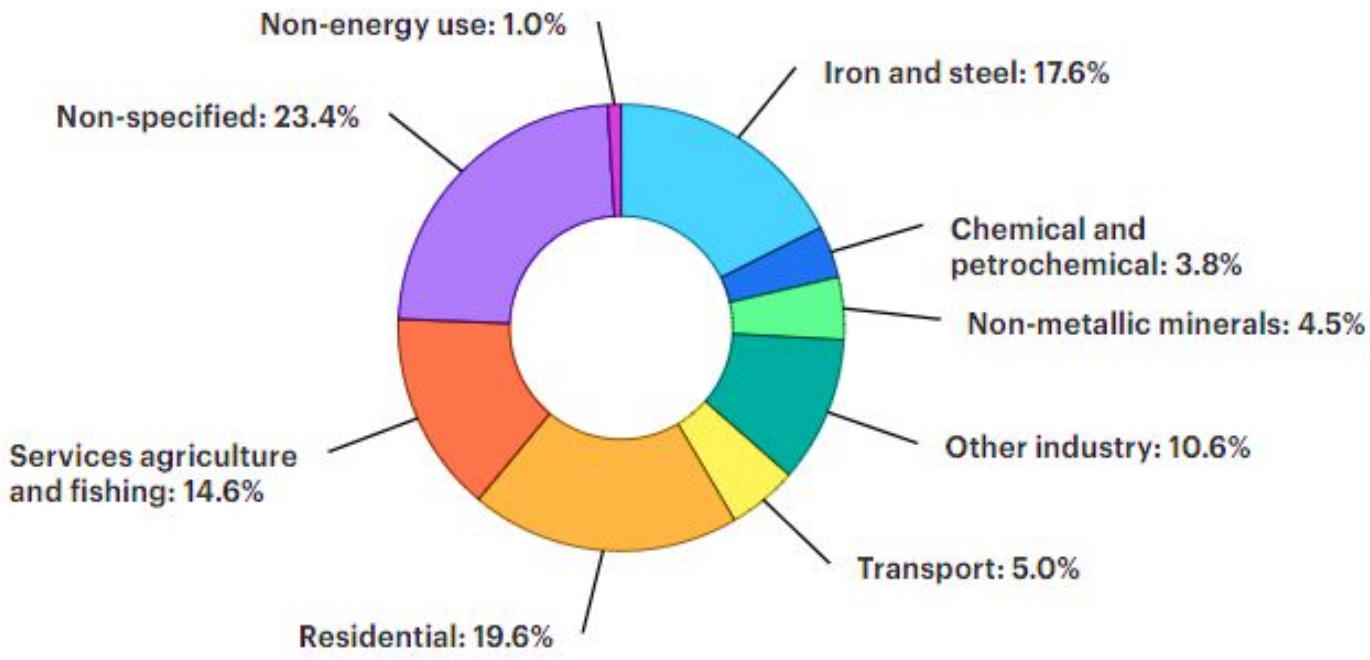
Sectorial Energy consumption:

OECD total final consumption by source - 2019



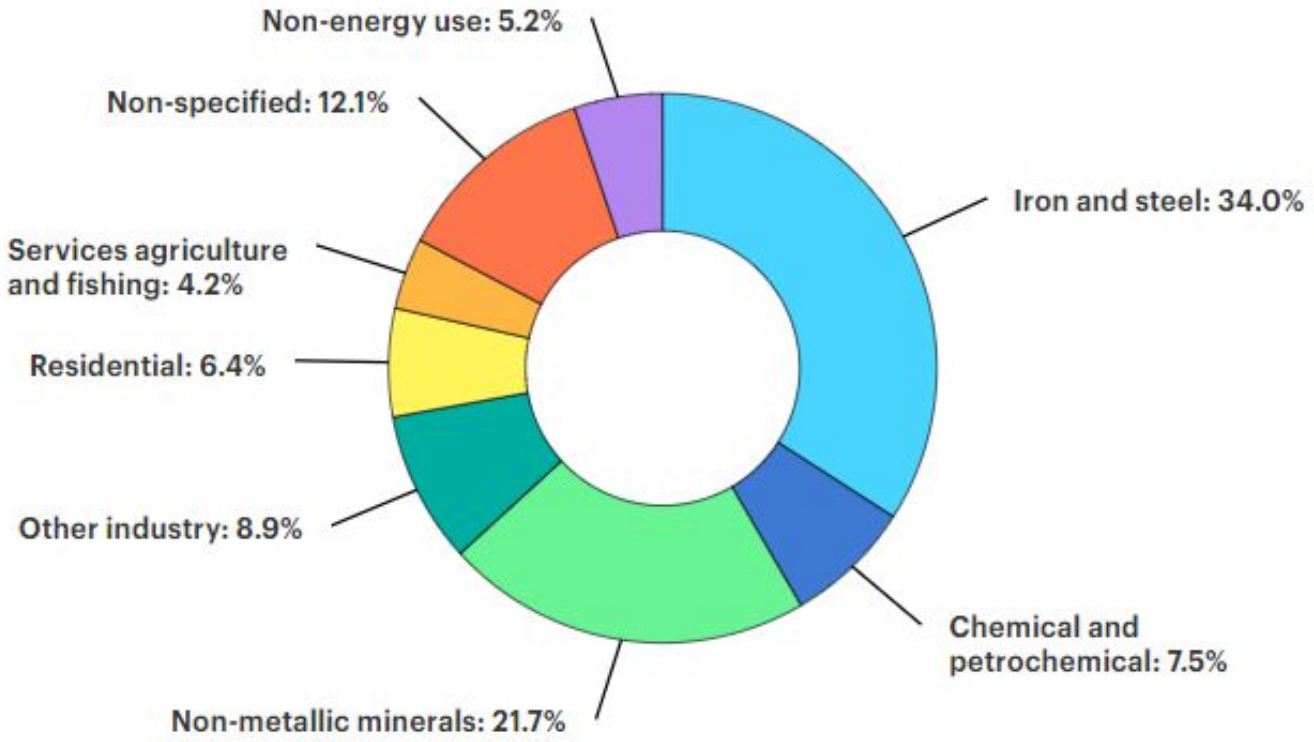
Sectorial Energy consumption:

Coal final consumption by sector - 1973



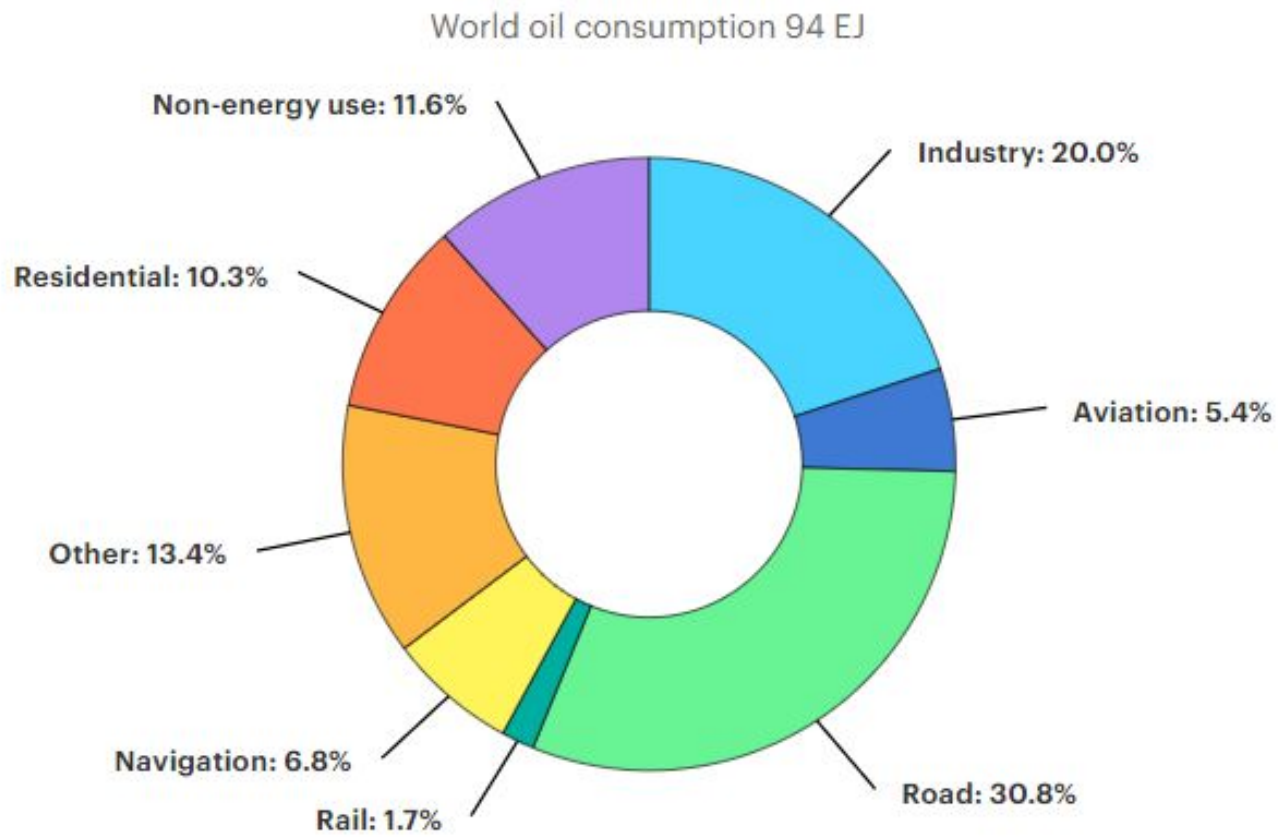
Sectorial Energy consumption:

Coal final consumption by sector - 2019



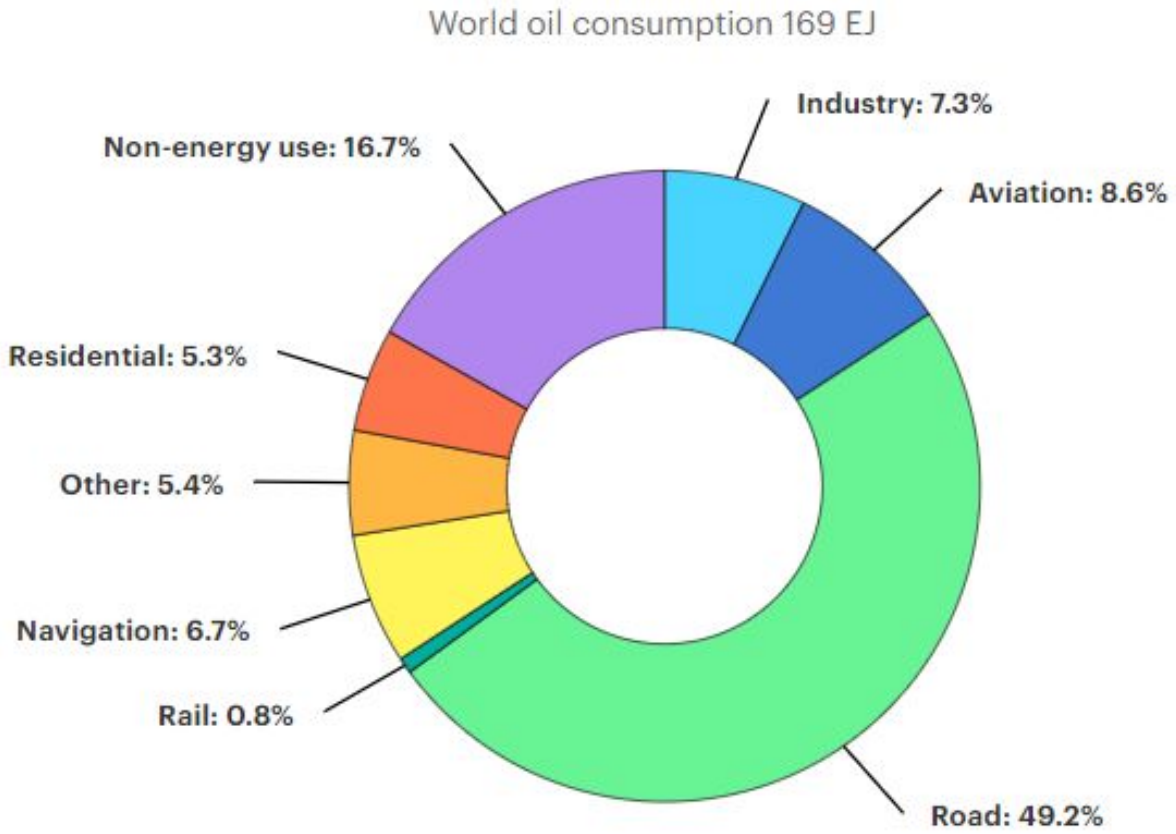
Sectorial Energy consumption:

Oil final consumption by sector - 1973



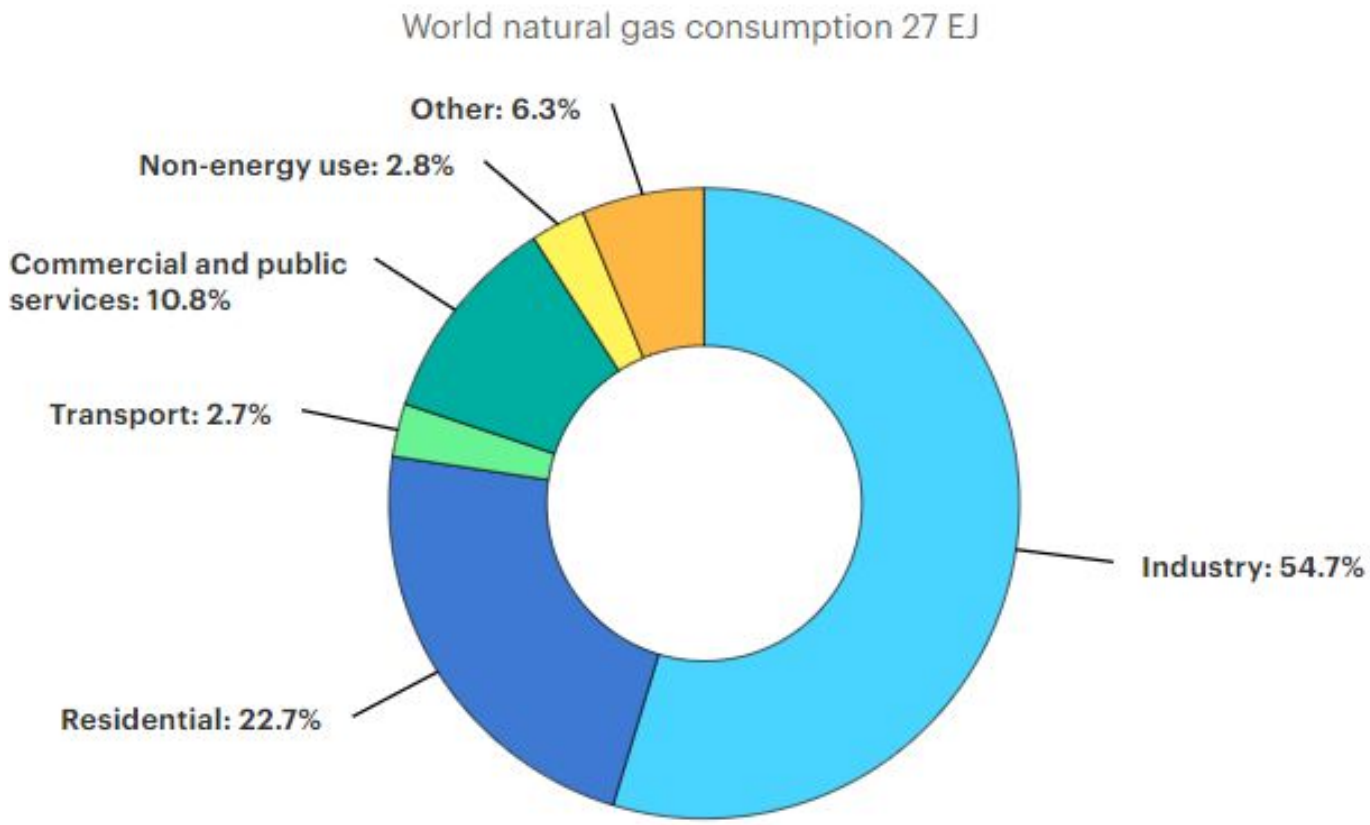
Sectorial Energy consumption:

Oil final consumption by sector - 2019



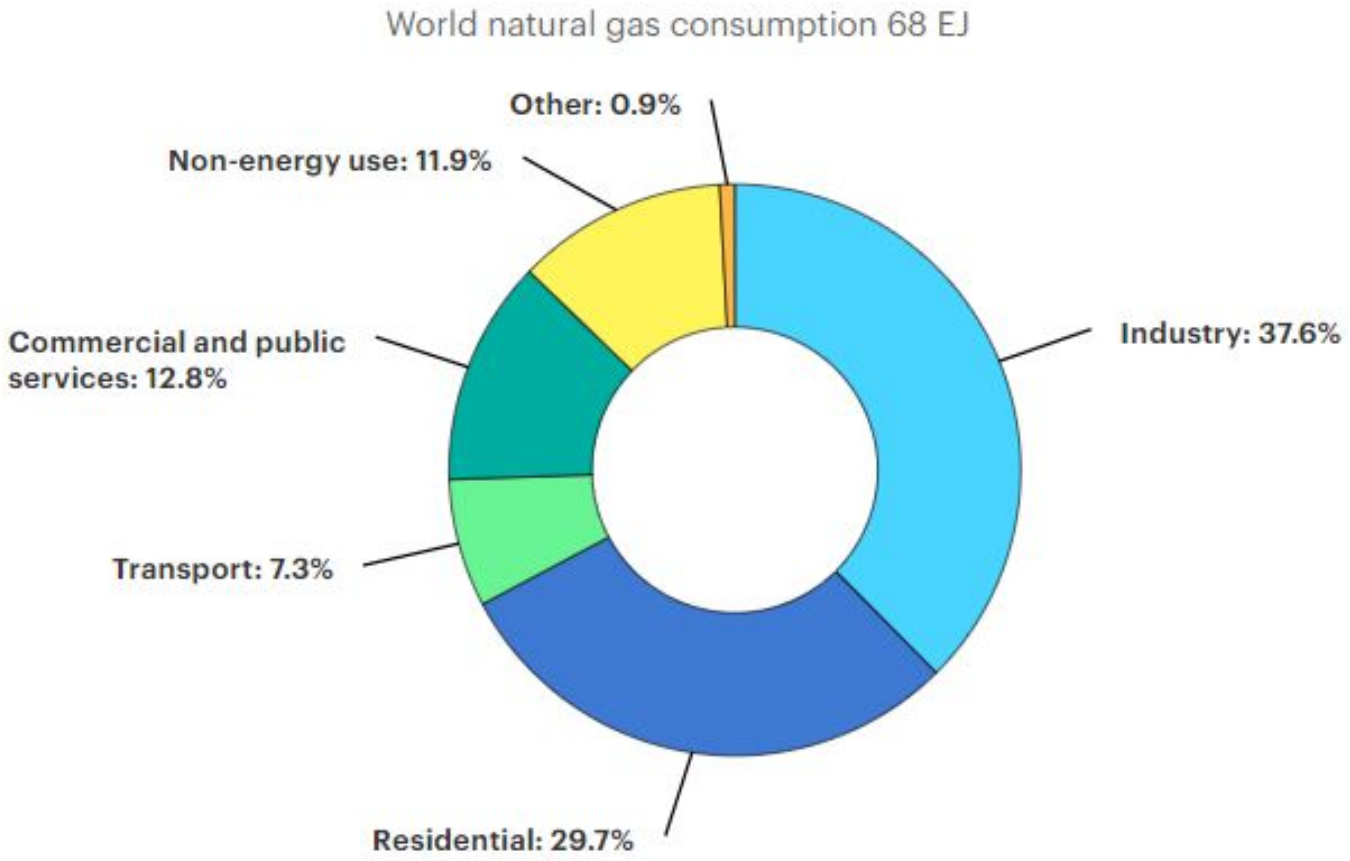
Sectorial Energy consumption:

Natural gas final consumption by sector - 1973



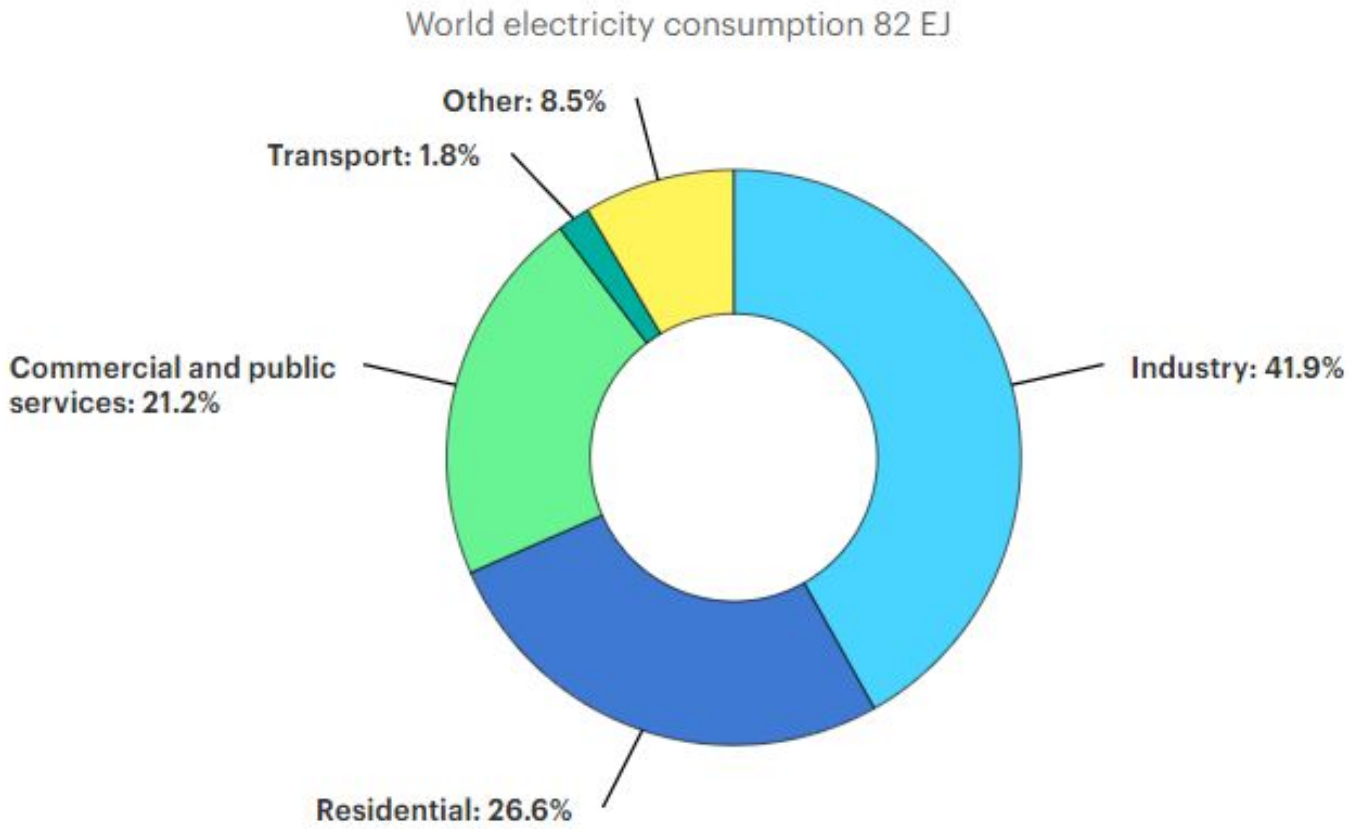
Sectorial Energy consumption:

Natural gas final consumption by sector - 2019



Sectorial Energy consumption:

Electricity final consumption by sector - 1973



Sectorial Energy consumption:

Electricity final consumption by sector - 2019