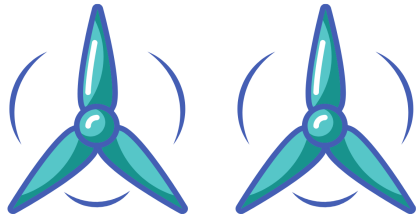
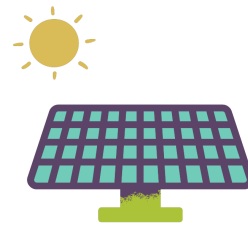


Wind



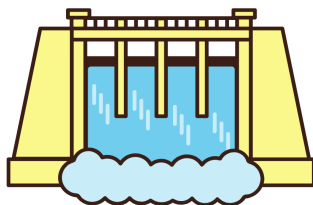
Energy density.... 0.0003
Safety..... 25
Life span..... 25y
Reliability..... 26%
Carbon Footprint....16
Public Support.....93%

Solar



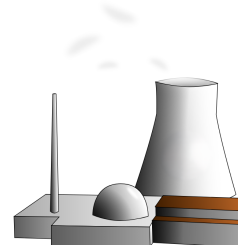
Energy density0.0003
Safety 50
Life span..... 30y
Reliability.....13%
Carbon footprint..... 65
Public support.....97%

Hydropower



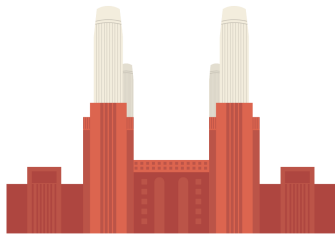
Energy density.... 0.0003
Safety 1
Life span..... 100y
Reliability..... 45%
Carbon footprint..... 177
Public Support..... 91%

Nuclear



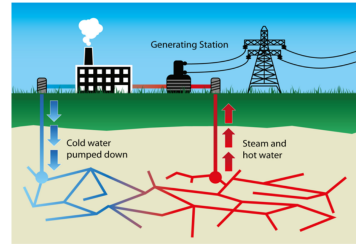
Energy density.. 20,000,000
Safety.....33
Life span..... 100y
Reliability..... 92%
Carbon Footprint..... 6
Public Support..... 38%

Coal



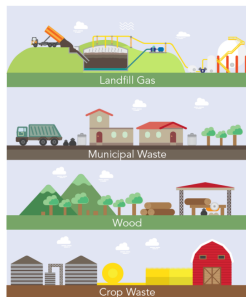
Energy density..... 1
Safety..... 0.04
Life span..... 50y
Reliability..... 80%
Carbon Footprint..... 925
Public Support..... 48%

Geothermal



Energy density.... 0.0003
Safety..... n/a
Life span..... 100y
Reliability..... 74%
Carbon footprint..... 40
Public Support..... N/a

Biomass



Energy density..... 1
Safety..... 0.2
Life span..... 30y
Reliability..... 64%
Carbon footprint..... 200+
Public Support..... N/a

Gas



Energy density..... 1
Safety..... 0.4
Life span..... 30y
Reliability..... 85%
Carbon Footprint..... 455
Public Support..... 80%

Types of Energy

Nuclear Energy can harness extremely high energy of the nuclear forces to generate energy with very little fuel and very little waste. Initial nuclear plants were designed for making plutonium and uranium but current nuclear plants under construction/planned in the UK are for civilian purposes only. Nuclear energy is safe contrary to public perception.

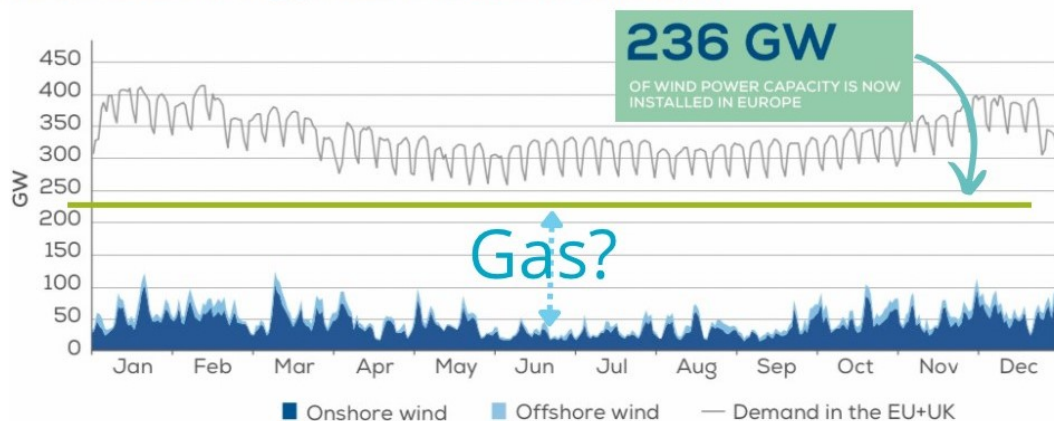
‘Spent’ fuel is cooled for 2-3 decades in a deep pool of water. Then remotely operated equipment dismantles the fuel elements to be dry stored inside casks for a few hundred years. Very little waste is produced due to the extremely high energy density of the fuel.

Coal is a reliable source of ‘baseload’ energy which captures the fast energy of electrons in carbon-based molecules. As a fossil fuel, it generates carbon dioxide, responsible for the greenhouse effect, as well as particulate matter which can create smog and potentially contribute to respiratory problems in built up regions.

Gas is a generally reliable and flexible energy source which captures electron-energy. As a fossil fuel, it releases carbon dioxide, which stays in the atmosphere 300-1000 years, and methane, which stays in the atmosphere for around 12 years. Methane has more warming potential than carbon dioxide.

Wind-generated power is a variable resource, and the amount of electricity produced at any given point in time by a plant will depend on wind speeds, air density and turbine characteristics. Installed capacity is fixed, but supply and demand are variable characteristics that don’t necessarily match as shown:

Power demand and wind energy generation in the EU-27 and the UK in 2021 (GW)



Source: WindEurope

Solar photovoltaics are silicon semiconductors that absorb sunlight and create an electric current. Photovoltaics have been popularised due to subsidies. A 300 Watt PV panel is 10% reliable in the UK, meaning on average, it would generate enough energy to power a 30 Watt lightbulb continuously (if the requisite battery storage were theoretically feasible).

Hydropower / hydroelectric power is one of the oldest and largest sources of renewable energy, which uses the flow of moving water released from behind a thick concrete dam to generate electricity.



Geothermal energy harnesses the natural heat of rocks in the ground. It is potentially feasible in geologically unstable areas with significant tectonic activity in the crust. Geothermal plants exist in California, Italy and Iceland.

Biomass is considered 'renewable' in the UK, though it primarily derives from burning imported woodchips at Yorkshire's Drax power plant as well as energy-from-waste schemes.

Burning wood releases carbon dioxide which contributes to the greenhouse effect.

Notes

Energy density in kWh/kg derived from Nature, Energy and Society: A Scientific Study of the Options Facing Civilisation Today

Safety inverts the rate of death per TWh compiled from ourworldindata.org

Life Span is the maximum life expectancy of a technology (approximate, depending on design, feasibility, grid system, political factors etc)

Reliability (Capacity factor) and **lifecycle greenhouse gas emissions** (grams of carbon dioxide equivalent per kWh), are from the UNECE Report Life Cycle Assessment of Electricity Generation Options (2022)

Public support figures are derived from various online MORI and IPSOS polls, and this data is difficult to obtain, sometimes not available (n/a)