Methodology

How data is sourced, converted, charted and corrected. Each report links to the exact version it used.

Version

v1.1 · current · 2 Dec 2025

1. Principles

- **Source on the figure.** Every chart footer names the source, the retrieval date and the section of this methodology it relies on.
- **Amounts and rates apart.** Energy (Wh, J, Btu) and power (W) never share an axis.
- **Fixed colours.** Each energy source keeps one colour on every chart, in both themes.
- **No unlabelled illustrations.** Illustrative numbers always carry a visible “Example data” label.

2. Units and conversions

Energy is reported in watt-hours with SI prefixes for electricity, and in joules for primary energy. US-sourced primary energy may also be shown in quads. Conversions use the factors below.

Table 2. Conversion factors

From	TWh	PJ	EJ	quad

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1 TWh	1	3.6	0.0036	0.003412
1 EJ	277.78	1,000	1	0.9478
1 quad (10^{15} Btu)	293.07	1,055.06	1.05506	1
1 Mtoe	11.63	41.868	0.041868	0.03968

Btu is the International Table Btu (1,055.06 J). Mtoe uses the IEA convention of 41.868 GJ per tonne of oil equivalent.

2.2 Capacity versus generation

Capacity (kW, MW, GW) is a maximum rate of output. Generation (kWh … TWh) is energy delivered over a period. Where both appear, they are shown in separate panels with separate scales, and the capacity factor is defined as:

$$\mathrm{CF} = \frac{E_{\mathrm{actual}}}{P_{\mathrm{rated}} \times T} \tag{1}$$

For capacity that changes during the year, use a time-weighted average of P_{rated}, not the year-end value.

3. Data sources

Table 3. Sources used on this site

Ember, Yearly Electricity Data	
Used for	Generation, capacity, demand, net imports
Frequency	Annual
Licence	CC BY 4.0
Our World in Data, Energy dataset	
Used for	Primary energy consumption
Frequency	Annual

Licence	CC BY 4.0

U.S. EIA, Open Data

Used for	US series, international energy data
Frequency	Monthly, annual
Licence	US public domain

IEA, World Energy Balances

Used for	Sector end-use balances (planned)
Frequency	Annual
Licence	Licence terms to confirm

LLNL, Energy flow charts

Used for	Source-to-end-use flows (planned)
Frequency	Annual
Licence	Terms to confirm

4. Maps and regions

World maps use the Equal Earth projection, which keeps country areas comparable. Boundaries come from Natural Earth (public domain). Countries without data are hatched, never coloured as zero.

5. Example data

> **RULE**
>
> Illustrative numbers are allowed only with the visible label “Example data · not real values” on the chart itself, and “Example data” in the source line.

6. Trade and flows

Net imports equal reported imports minus exports over the calendar year, in TWh. They describe energy moved, not the capacity of the links that carried it.

7. Versions and corrections

Each methodology version is kept and linked. Select a marker to see what changed.

> **v1.0 · 18 Nov 2024** Placeholder: first published methodology.

> **v1.1 · 2 Dec 2025** Placeholder: description of a change to a conversion or source.

> **v1.2 · planned** Placeholder: draft under review, not yet in use.

How to cite

Cite reports by title, version and permalink, as shown in the “Cite this report” box on each report. Cite the underlying data sources too: they are named in every chart footer and CSV header.