

GERMANY'S ENERGY TRANSITION

A DATA-DRIVEN ANALYSIS OF THE SHIFT FROM
FOSSIL TO RENEWABLE ENERGY

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Why is this topic relevant?

- Germany's "Energiewende" aims for carbon neutrality by 2045
- Energy security → Germany has to reduce dependence on imported fossil fuels
- According to the International Energy Agency (IEA), its key to Germany's competitiveness

Analysis should show if Germany is on track to meet those goals

Research Question:
**How has the share of renewable energy in Germany's
electricity mix evolved in the years from 2020 to 2025,
and which renewable energy source had the biggest
impact?**



DATA AND METHODOLOGY

Datasets:

- Smard (Federal Network Agency)
- Eurostat
- IEA
- Agora Energiewende
- Statistical federal agency (Statistisches Bundesamt)



Variables:

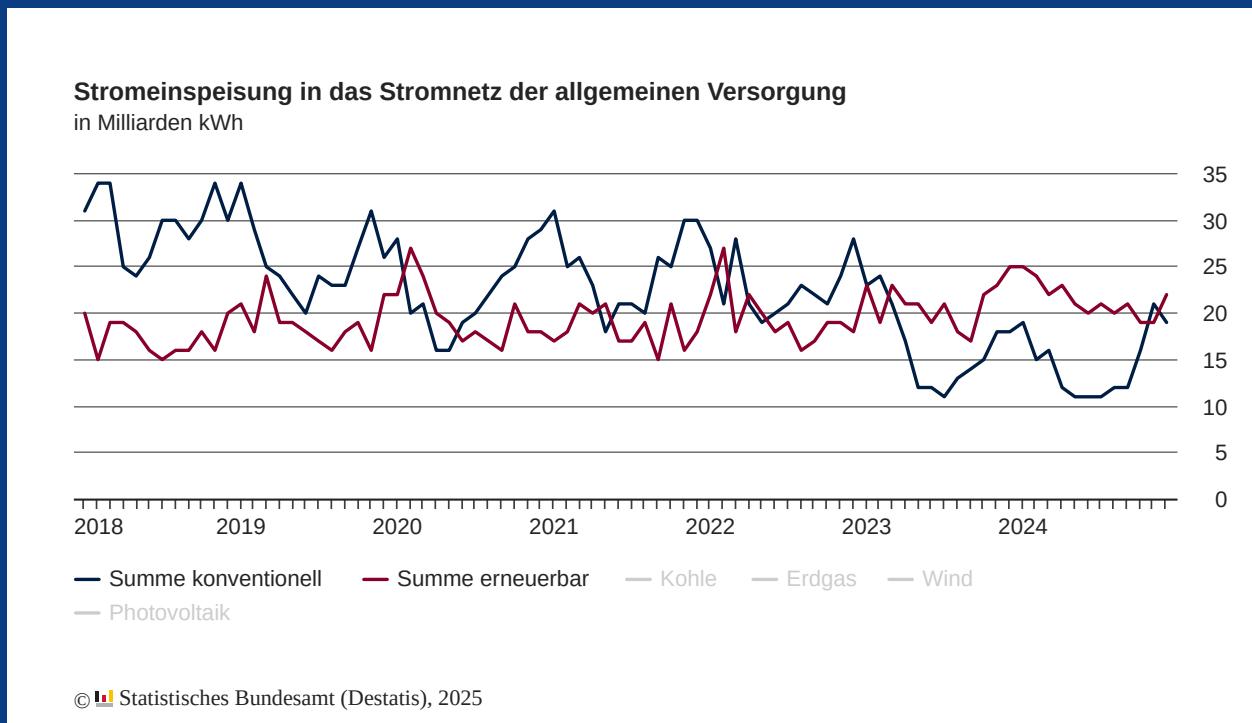
- Energy generation by source
- Energy share of renewable vs. fossil
- Imports/exports

Tools:

- R for data visualization and cleaning
- Quarto for publishing
- GitHub for sharing

FINDINGS

```
data <- read.csv("C:/Users/frede/Downloads/Realisierte_Erzeugung_202001010000_202511020000_Jahr (2).csv",
  sep = ";",
  dec = ".",
  header = TRUE,
  stringsAsFactors = FALSE)
```



Line chart- foosil vs renewable share 2018-2024
Source:https://www.destatis.de/DE/Presse/Pressemitteilungen/2025/03/PD25_091_43312.html

	Datum.von	Datum.bis	Biomasse..MWh..Berechnete.Auflösungen	Wasserkraft..MWh..Berechnete.Auflösungen
1	01.01.2020	01.01.2021	39.966.301,25	15.945.659,50
2	01.01.2021	01.01.2022	38.235.128,00	14.888.434,25
3	01.01.2022	01.01.2023	37.738.237,75	12.804.450,00
4	01.01.2023	01.01.2024	37.295.318,00	15.019.800,25
5	01.01.2024	01.01.2025	36.197.008,25	17.551.916,00
6	01.01.2025	01.01.2026	-	-

Table of all renewable energy sources in Germany from 2020-2025

Source: <https://www.smard.de/home/downloadcenter/download-marktdaten/>



CHALLENGES AND ISSUES

Technical aspects:

- R coding
- Quarto publishing

Data quality:

- **Missing values and inconsistent data of the year 2025 or previous ones**
- **Difficult to read**
- **Massive data packages**



Outlook

Next steps:

- **Import data into R**
- **Visualization of the table**
- **Comparison and integration of the data**
- **Completion of report**
- **Research for import and export data**

Sources

Folie 1: <https://www.bundeswirtschaftsministerium.de/Redaktion/EN/Pressemitteilungen/2025/04/20250328-international-energy-agency-recommends-germany-to-use-energy-transition-as-a-driver-of-energy-security-and-economic-competitiveness.html>

Folie 3 Chart: https://www.destatis.de/DE/Presse/Pressemitteilungen/2025/03/PD25_091_43312.html

Folie 3 Table: <https://www.smard.de/home/downloadcenter/download-marktdaten/>



THANK YOU
