DATA ANALYSIS OF GERMANY'S ELECTRICITY EXPORTS

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INATECH

Abstract

- The power generation is necessary for functioning of industries and bisnusses, however it also emits GHG and contributes to Global warming.
- Transition to more sustainable and clean electricity generation is the only way.
- Europe and Germany, in particular, play a big role in this.

Motivation & Target

- The EU-27 as a whole has made good progress, generating more electricity from renewable than fossil fuels for the first time in 2020
- EU Coal market is shrinking, being replaced mostly by Wind and Solar generation
- Even though Germany has a larger share of renewables, it is interesting to find out how net exporting/importing affects generation mix

State of the Art/Status

- The European Network of Transmision System Operators (ENTSO-E) is a common voice of the largest interconnected electrical grid in the world and it provides reliable statistical data for electricity generation analysis
- Ember is an independent climate and energy think tank focused on accelerating the global electricity transition from coal to clean. It provides helpful data and information for further understanding of electricity analysis

Sudy/Methodology

- For this study, Python programming language, especially pandas library, was mainly used
- All operations were conducted on the raw data in the excel sheet format
- All plots are done on Jupyter Notebook

pandas

Fig. 1: *pandas library*

jupyter

Fig. 2: *Jupyter Notebook*

Data/Theory

- The ENTSO-E Transparency Platform was used as the main source of data
- For corrections and overview the data and publications provided by https://ember-climate.org/ were greatly helpful

Fig. 3. *ENTSO-E Transparency Platform*

EMBER
COAL TO CLEAN ENERGY POLICY

Fig. 4: *Ember-Climate*

Results/Summary

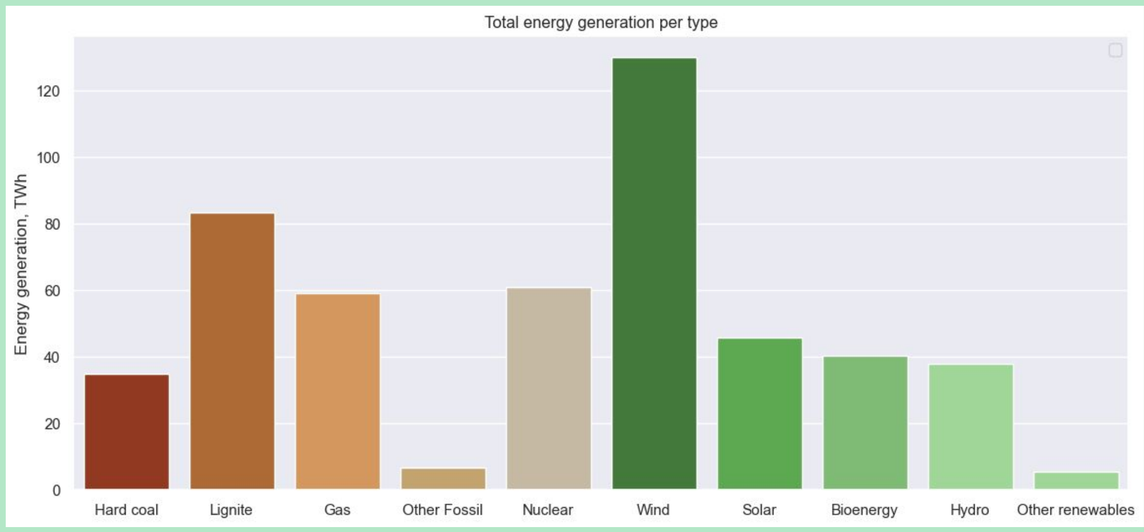

Fig. 5: *Total electrical energy generation in 2020, TWh*

- 2020 is landmark year, renewables overtook fossil fules for the first time. Renewables share – 51%, fossils share – 36%
- Wind generation share – 25.77%, Solar – 9.08%
- Wind and Solar share in German Electricity mix had an increase of 22% from 2019

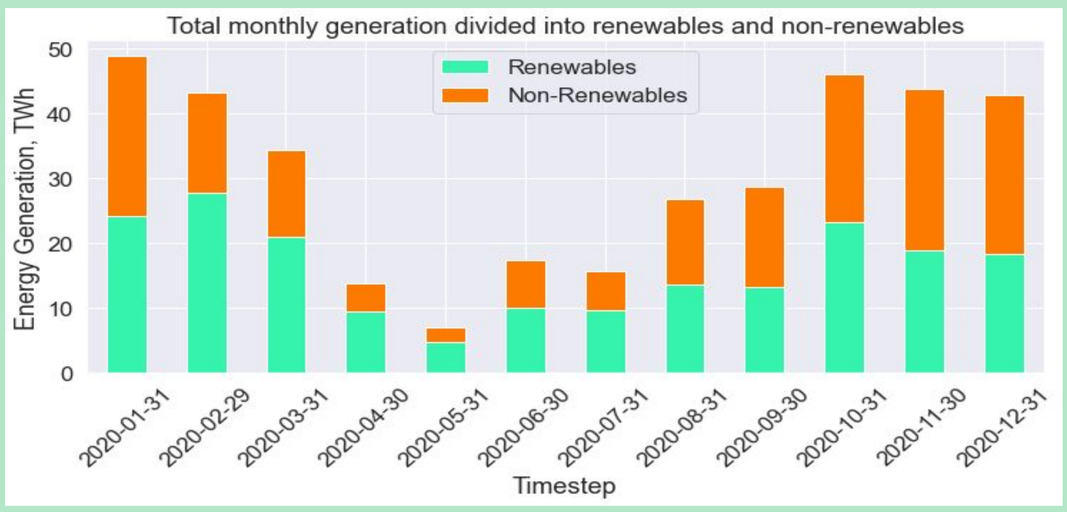

Fig. 6: *Net exporter monthly generation mix , TWh*

- Total cross-border export flow – 44.56 TWh

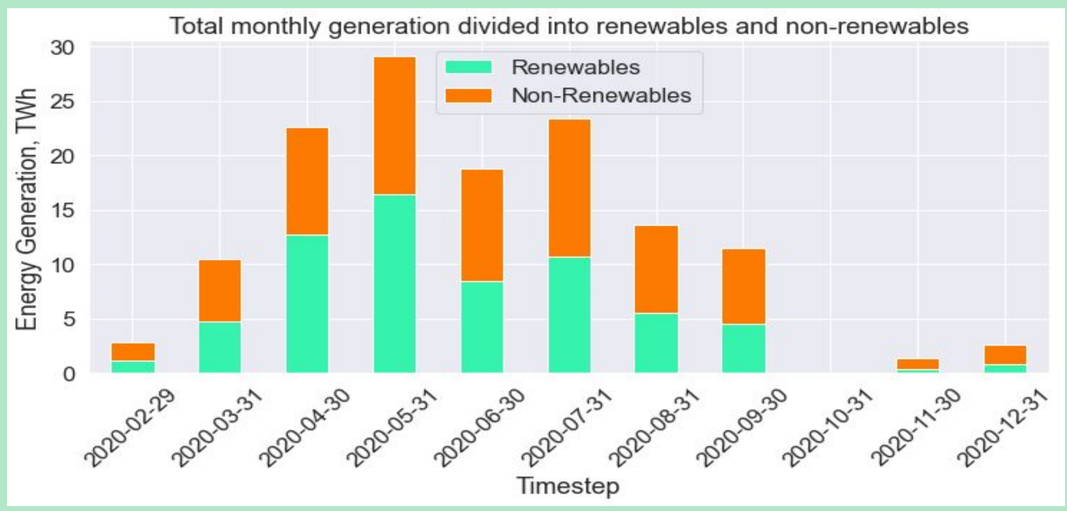

Fig. 7: *Net importer monthly generation mix, TWh*

- Total cross-border import flow – 17.82 TWh

Acknowledgement & References

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[1] https://transparency.entsoe.eu/

[2] https://ember-climate.org/

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