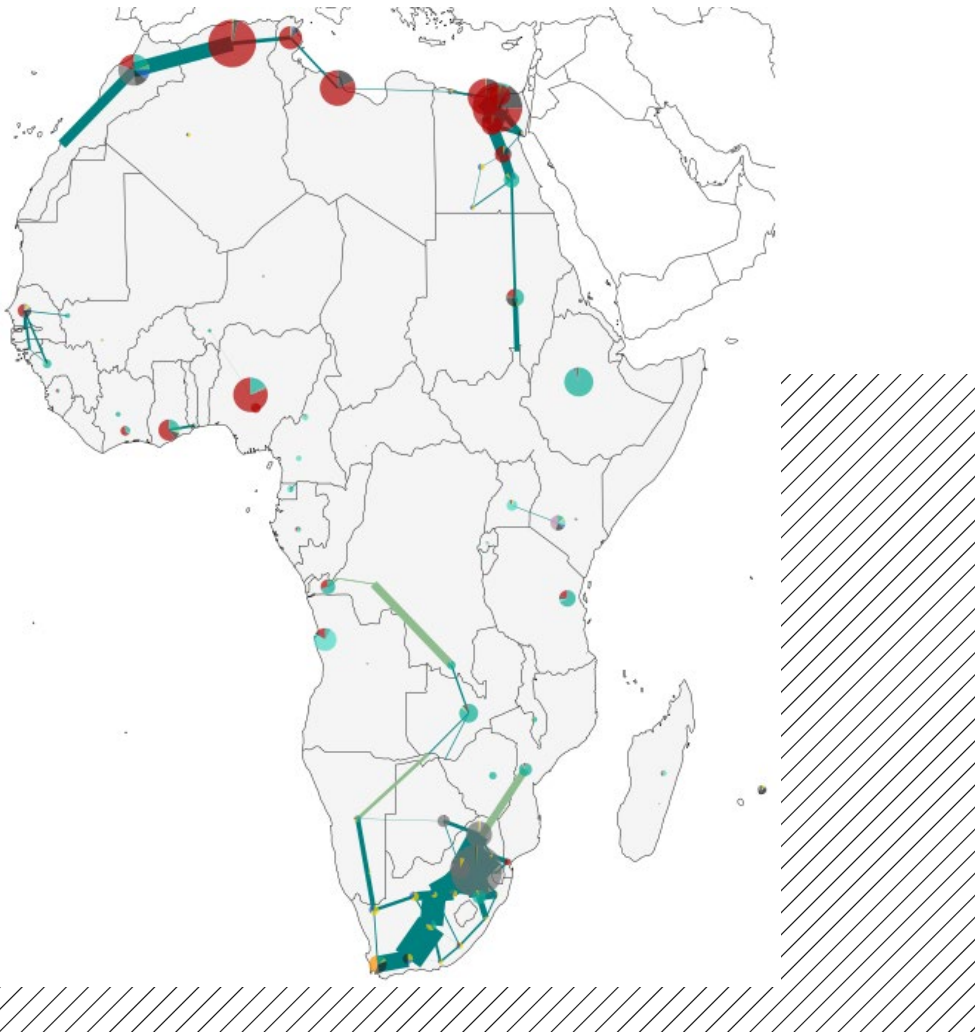# H2GLOBAL MEETS AFRICA

ANTON ACHHAMMER, M.SC, OTH REGENSBURG

H2Global meets Africa

Key facts

- Period: 01.01.2023 – 31.12.2025
- Budget: 4.2 Millionen €
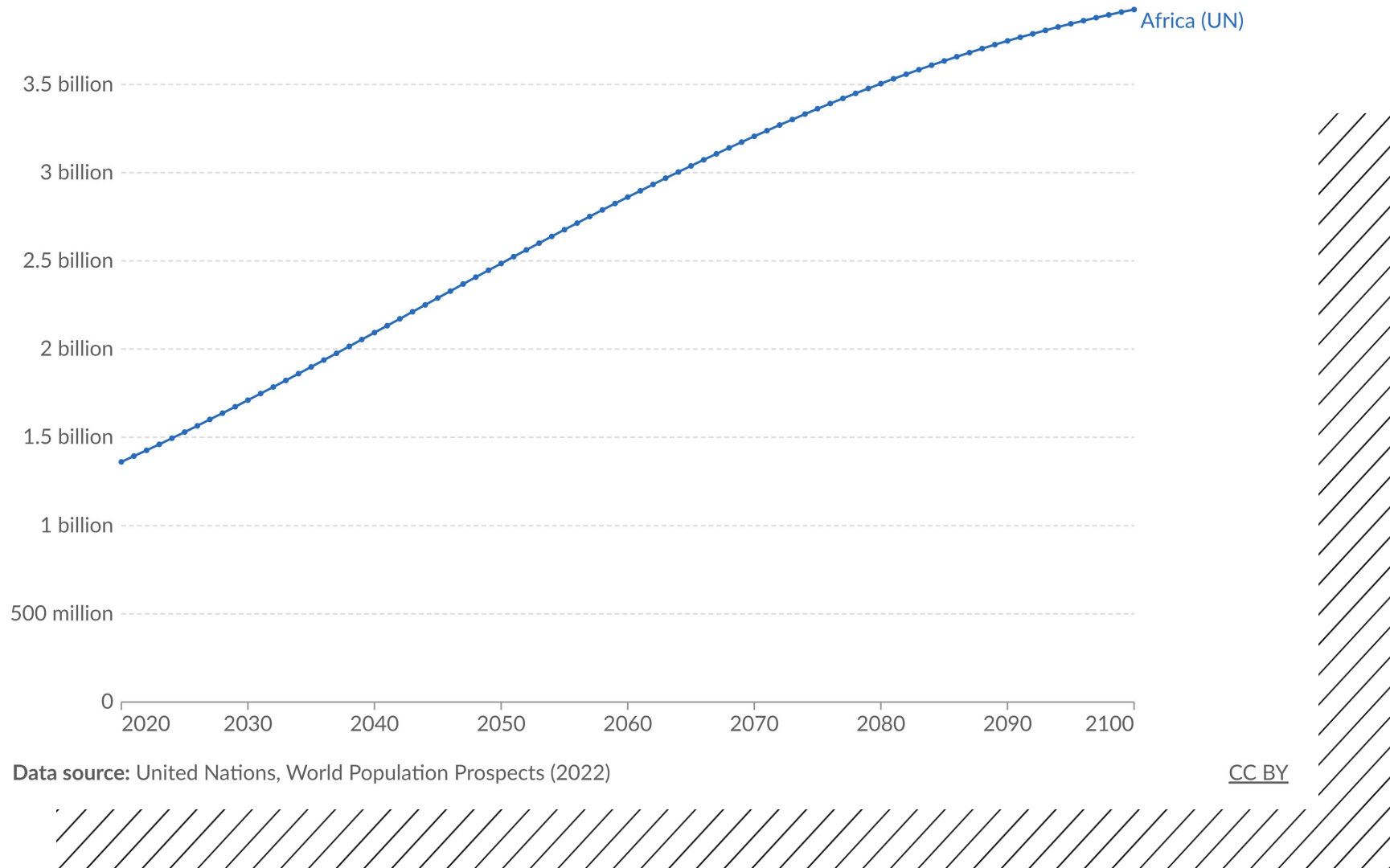- Funded by the Federal Ministry of Education and Research

Project partners

Associated partners

H2Global meets Africa

Motivation

Africa (UN)

3.5 billion
3 billion
2.5 billion
2 billion
1.5 billion
1 billion
500 million
0

2020   2030   2040   2050   2060   2070   2080   2090   2100

Data source: United Nations, World Population Prospects (2022)

CC BY
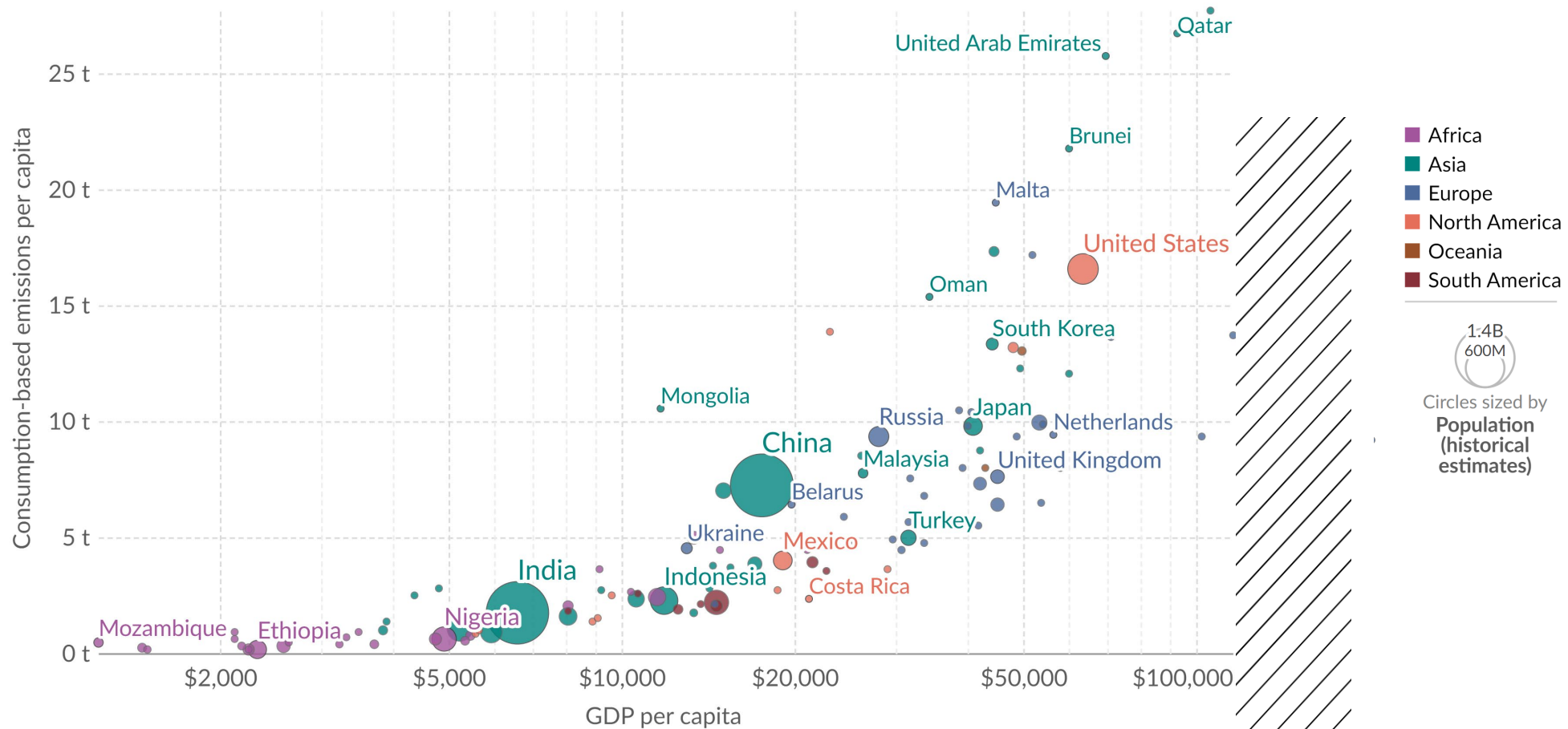
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Motivation

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Data source: Global Carbon Budget (2023); Population based on various sources (2023); World Bank (2023)
OurWorldInData.org/co2-and-greenhouse-gas-emissions | CC BY

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Methodology

WP 1 (OTH)
Project management and knowledge transfer

WP 3 (OTH)
Demand modelling in Germany/EU

WP 10 (OTH)
Off-take markets for Africa in Germany, EU and global

WP 6 (H2G)
Country categories

WP 5 (IEE)
Techno-economic analysis of integrated value chains in Africa and Germany

WP 4 (OTH)
Coupled energy systems EU and Africa

WP 7 (IEE)
PtX supply chains with partner countries via H2G

WP 2 (OTH)
Robust transformation pathways

WP 9 (H2G)
Further development of instruments

WP 8 (H2G)
Socio-economic and geostrategic analysis of integrated value chains in Africa and Germany

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Following the Idea of Open Energy Modelling

The whole chain from raw data to modelling results should be open:

open data   open source   open data   open access

Raw data → Data processing → Model formulation and software choice → Raw results → Result processing → Interpretation
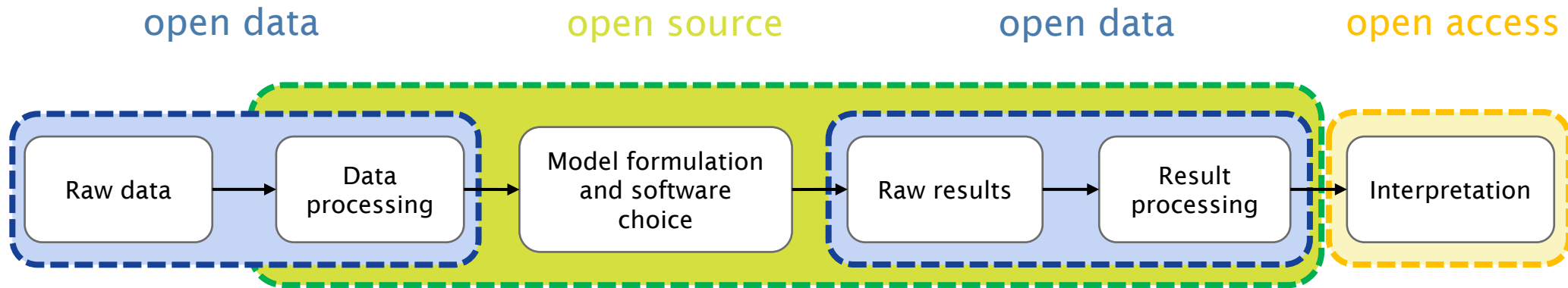
open data + free software → transparency + reproducibility

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Energy Transformation Pathways

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Main Models:

- PyPSA-Earth
- PyPSA-Earth-Sec
- PyPSA-Eur

Check out
PyPSA-Earth here:

Check out
PyPSA-Earth-Sec here:
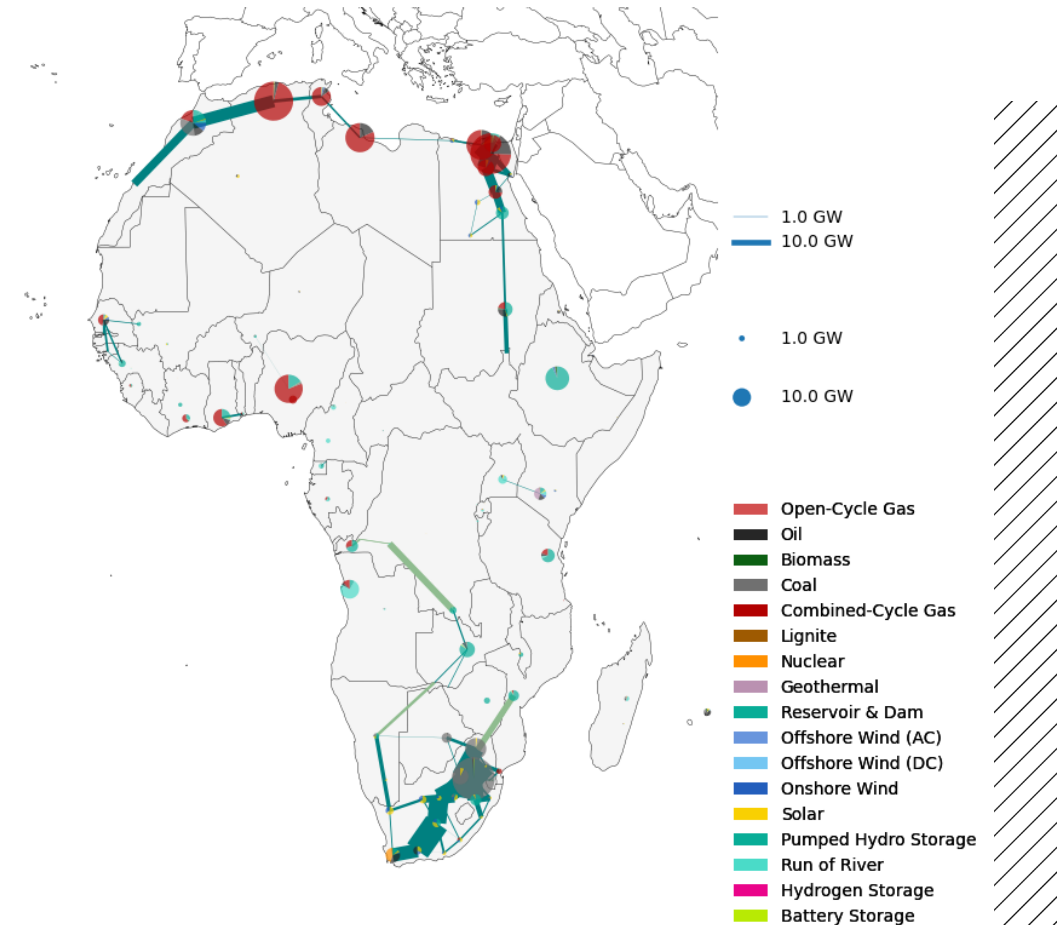
Quelle: Erstellt mit PyPSA-Earth und https://github.com/pypsa-meets-earth/documentation/blob/main/
notebooks/viz/regional_transm_system_viz.ipynb

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Model coupling Africa/Europe

Quelle: Erstellt mit PyPSA-Earth und https://github.com/pypsa-meets-earth/documentation/blob/main/notebooks/viz/regional_transm_system_viz.ipynb
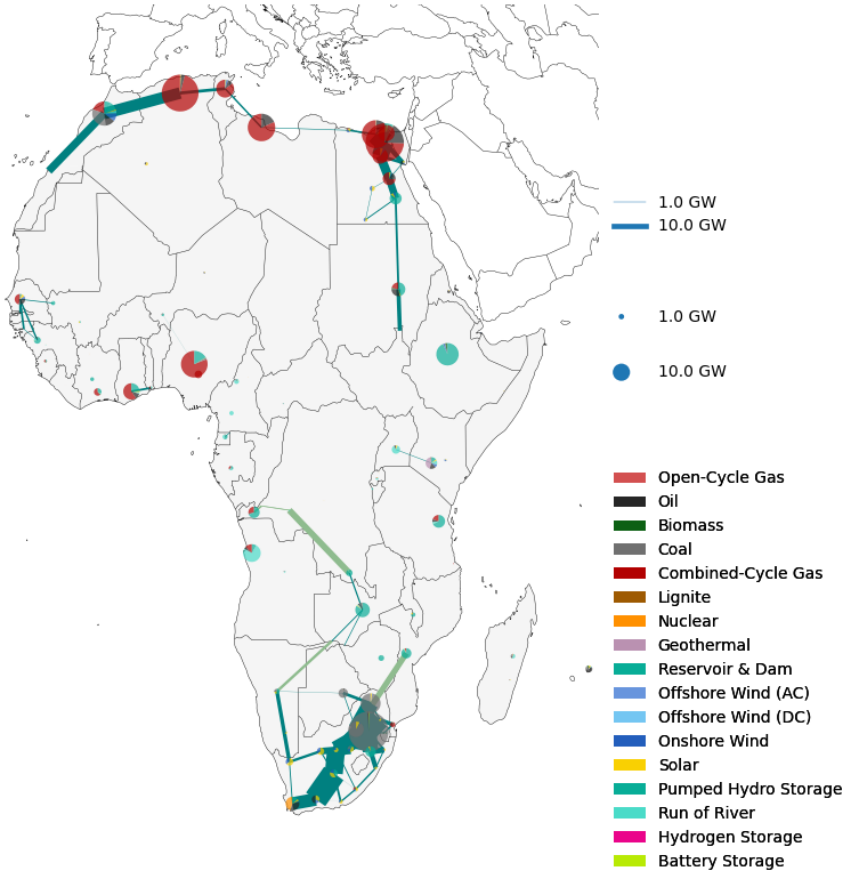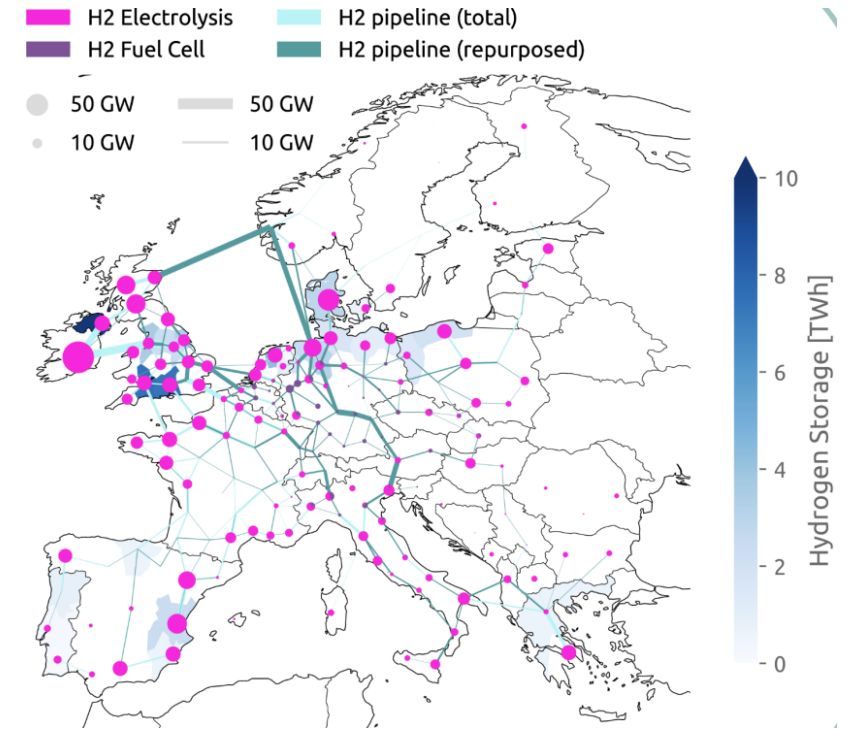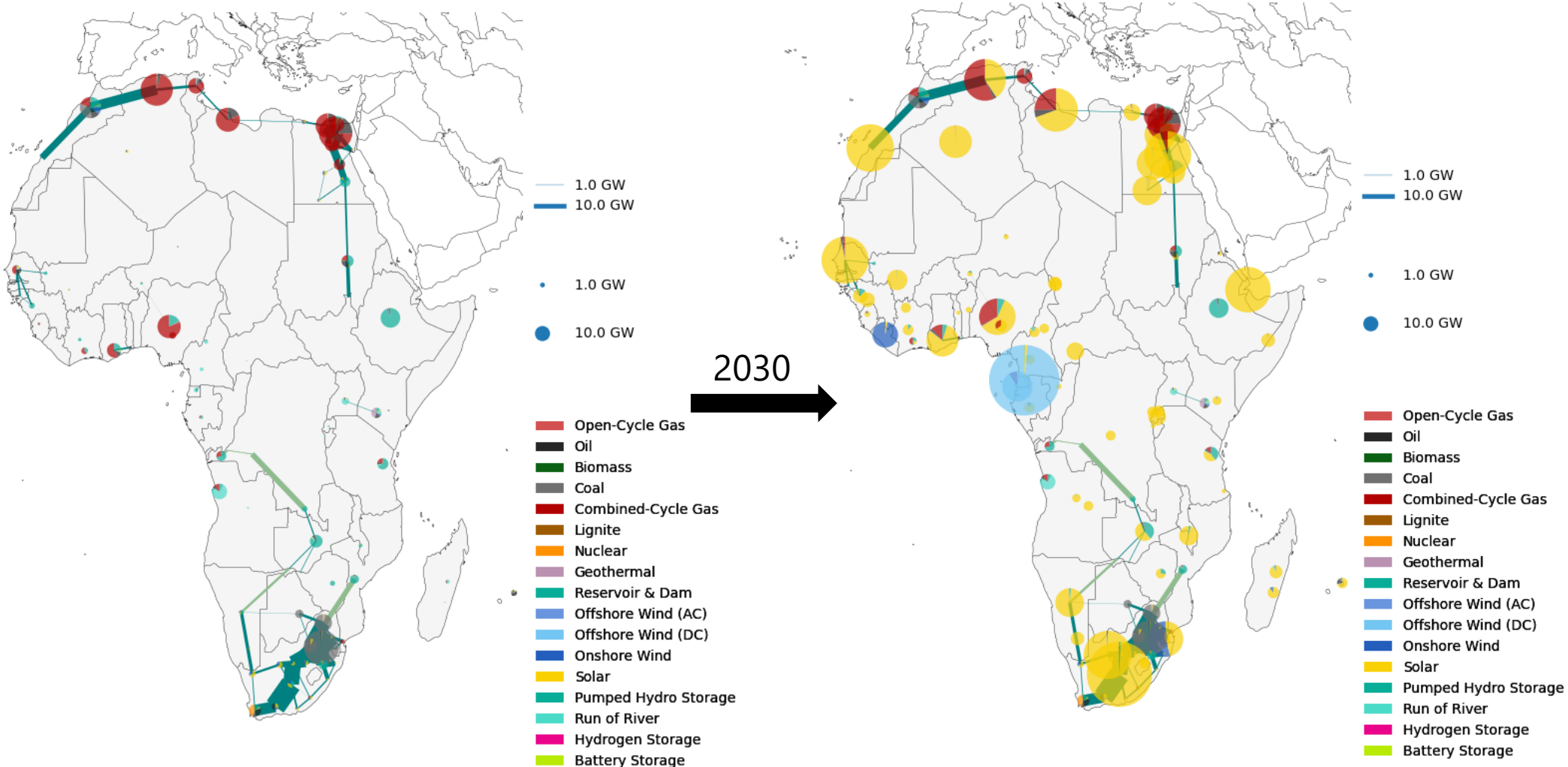
Direct model coupling

⟷

Common optimization of selected countries

Quelle: Neumann, Fabian; Zeyen, Elisabeth; Victoria, Marta; Brown, Tom (2022): Benefits of a Hydrogen Network in Europe

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Results

2030

Open-Cycle Gas
Oil
Biomass
Coal
Combined-Cycle Gas
Lignite
Nuclear
Geothermal
Reservoir & Dam
Offshore Wind (AC)
Offshore Wind (DC)
Onshore Wind
Solar
Pumped Hydro Storage
Run of River
Hydrogen Storage
Battery Storage

Check out PyPSA-Earth here:

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Contact us!

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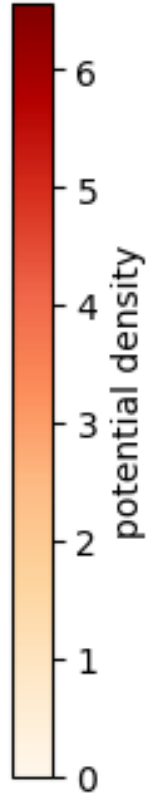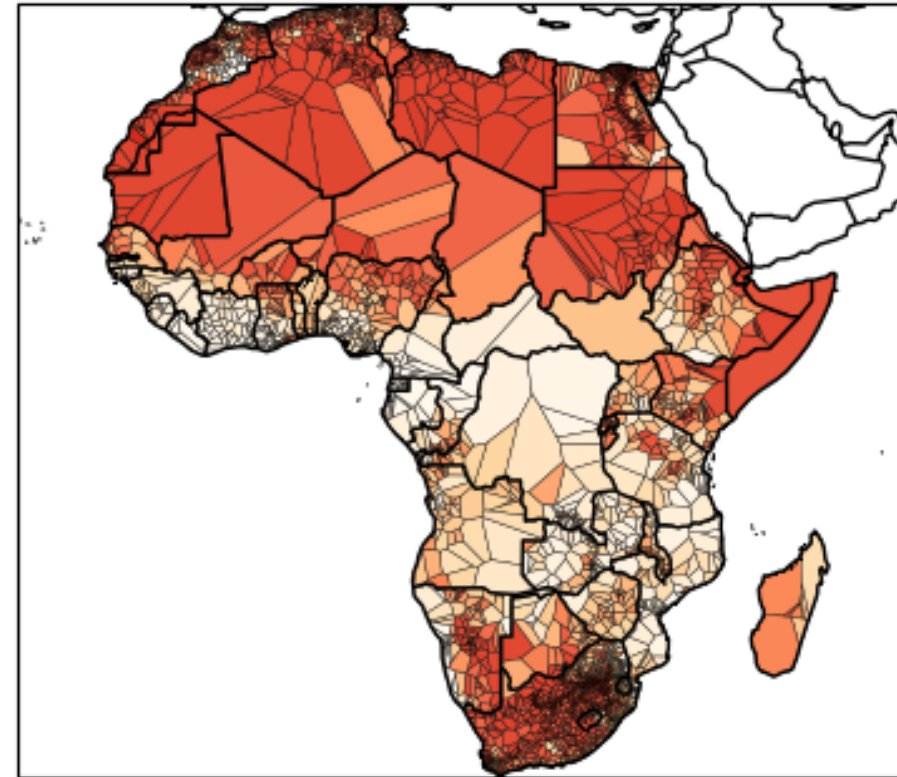OTH REGENSBURG

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Backup - Results

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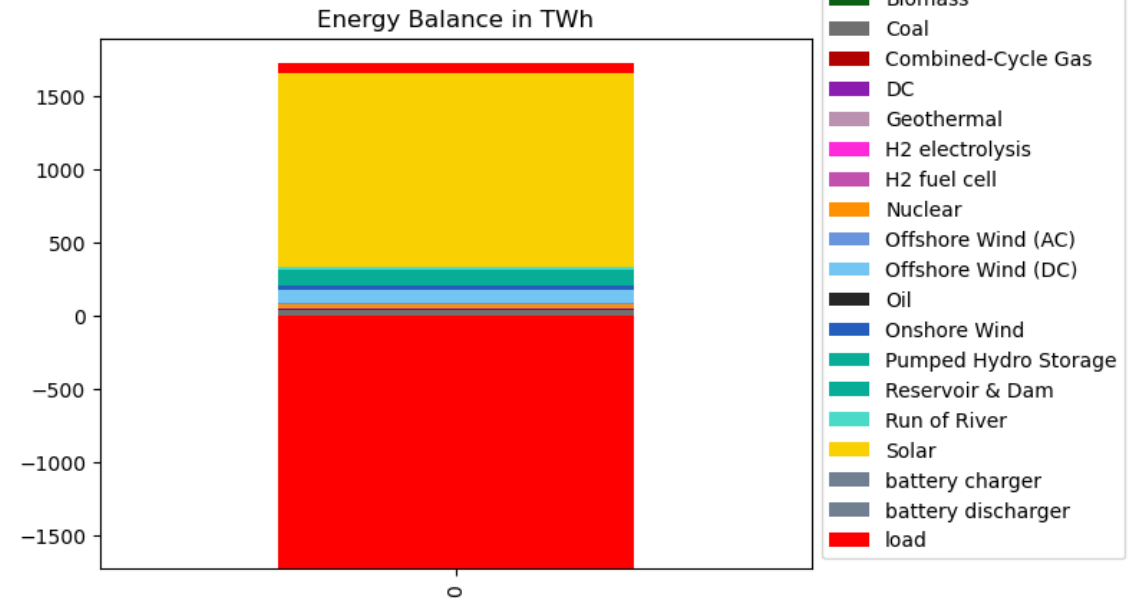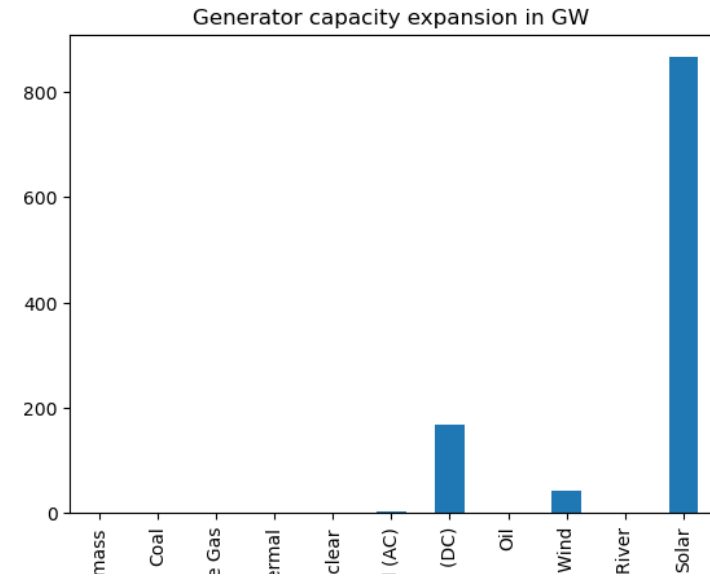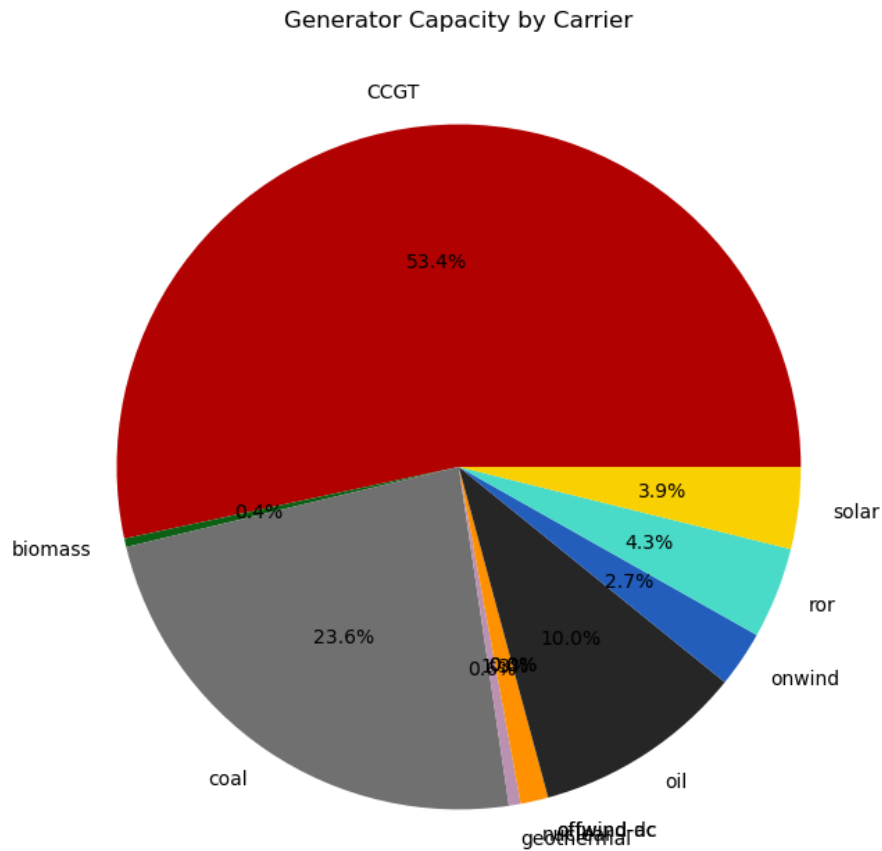Onshore Wind Potential Density [MW/km2]
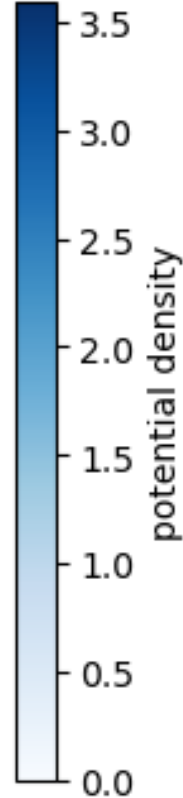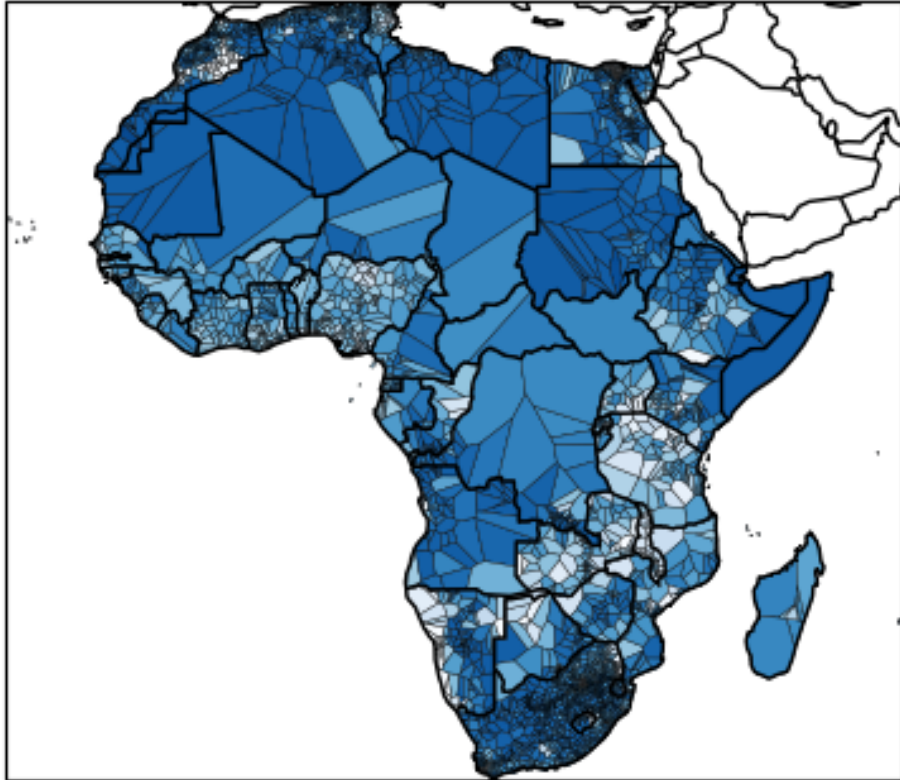
Solar Photovoltaic Potential Density [MW/km2]

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Backup - Results

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Backup – Salt deposits

Salt deposits (geological ages)
- Lower Cretaceous (Aptian)
- Quaternary
- Triassic-Jurassic
- Upper Tertiary (Miocene)
- Upper Triassic-Lower Jurassic

Reference: Horváth, Péter László & Schneider, Gregor-Sönke. (2018). Update of SMRI´s Compilation of Worldwide Salt Deposits and Salt Cavern Fields.