GONE WITH THE CLOUDS

ESTIMATING THE WATER FOOTPRINT OF DIGITAL DATA SERVICES IN EUROPE
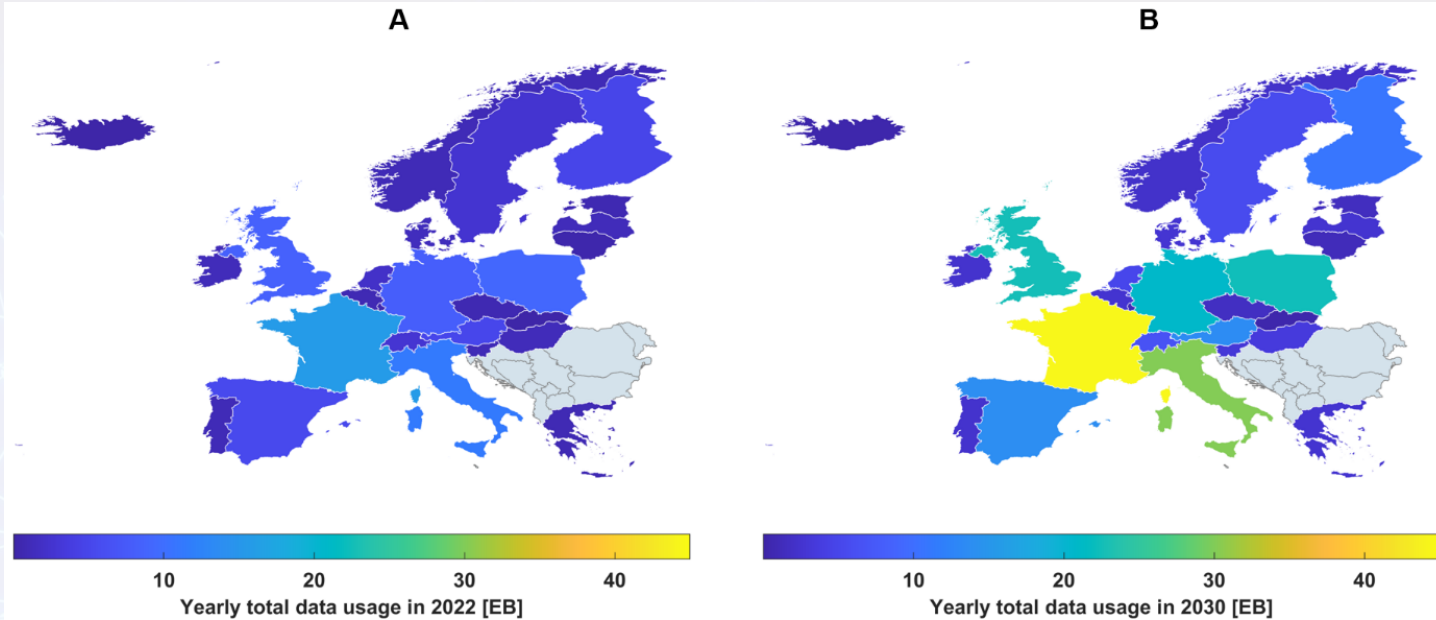
Javier Farfan
Francisco.FarfanOrozco@abo.fi

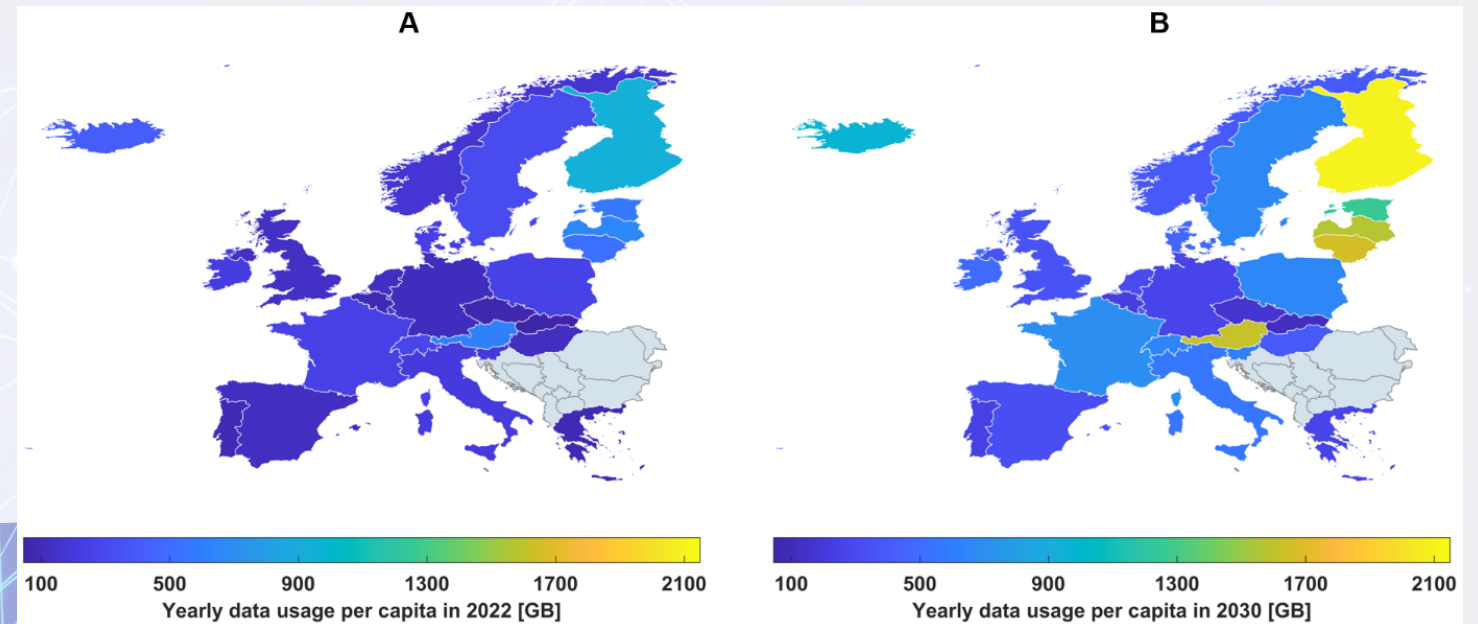Åbo Akademi University

ETH zürich

Alena Lohrmann
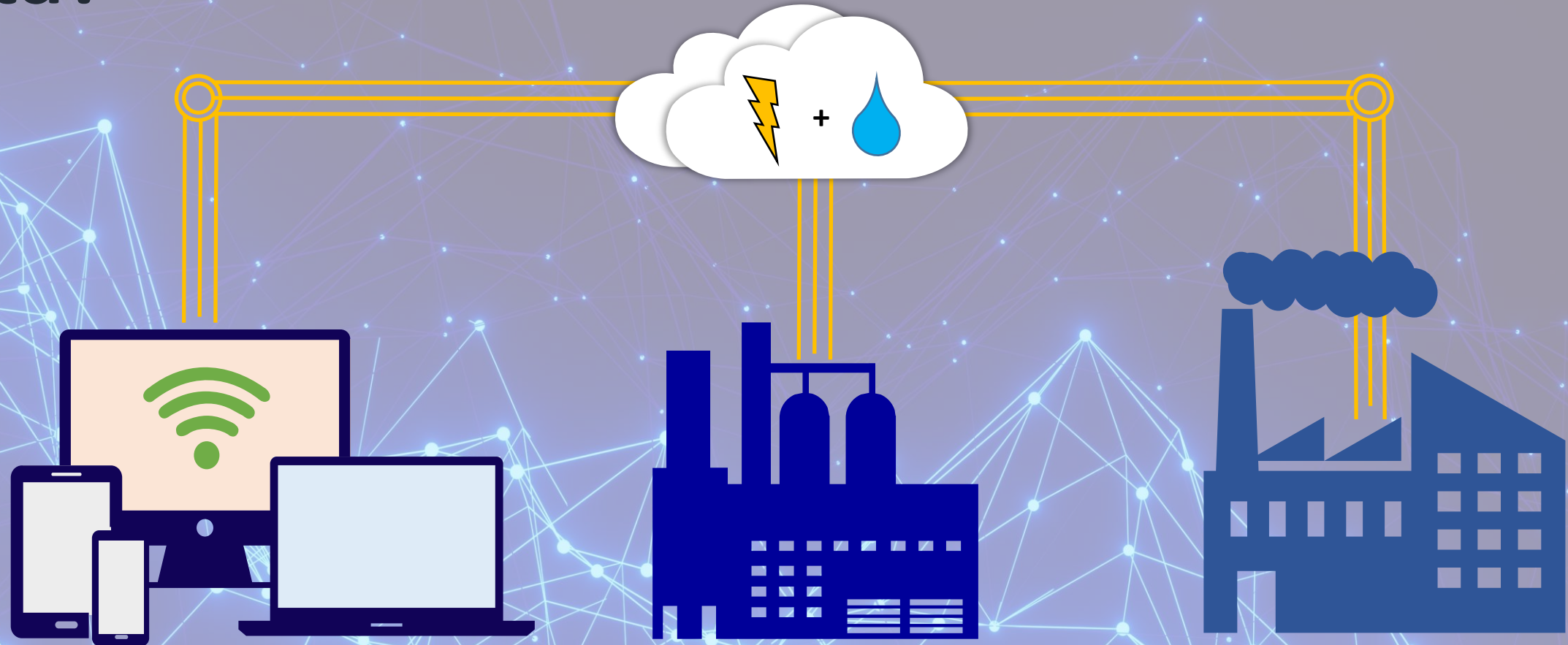**alohrmann@ethz.ch**

How has the data usage evolved?

In total, OECD Europe used around 60 EB of data in 2020, which could reach 225 EB by 2030.

Per capita, OECD Europe used an average of around 190 GB of data in 2020, which could reach 670 GB by 2030.

How are water and energy consumed by data?

Data usage
Data is generated and broadcasted from and to homes and mobile devices.

Data transmission
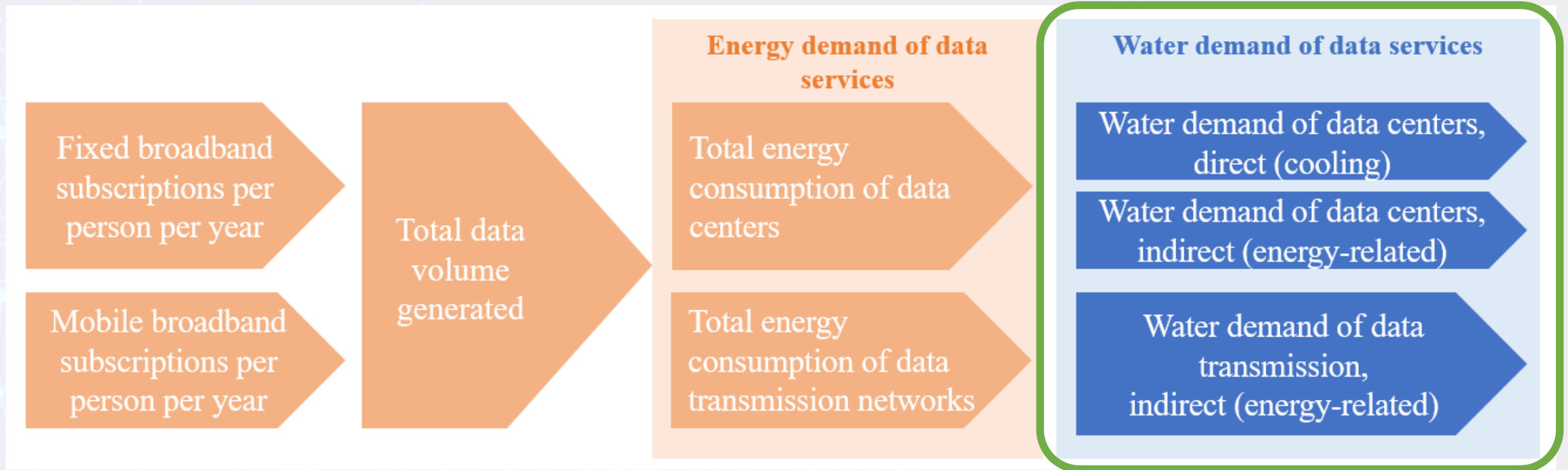Data is transmitted across different media to and from data centers.

Data centers
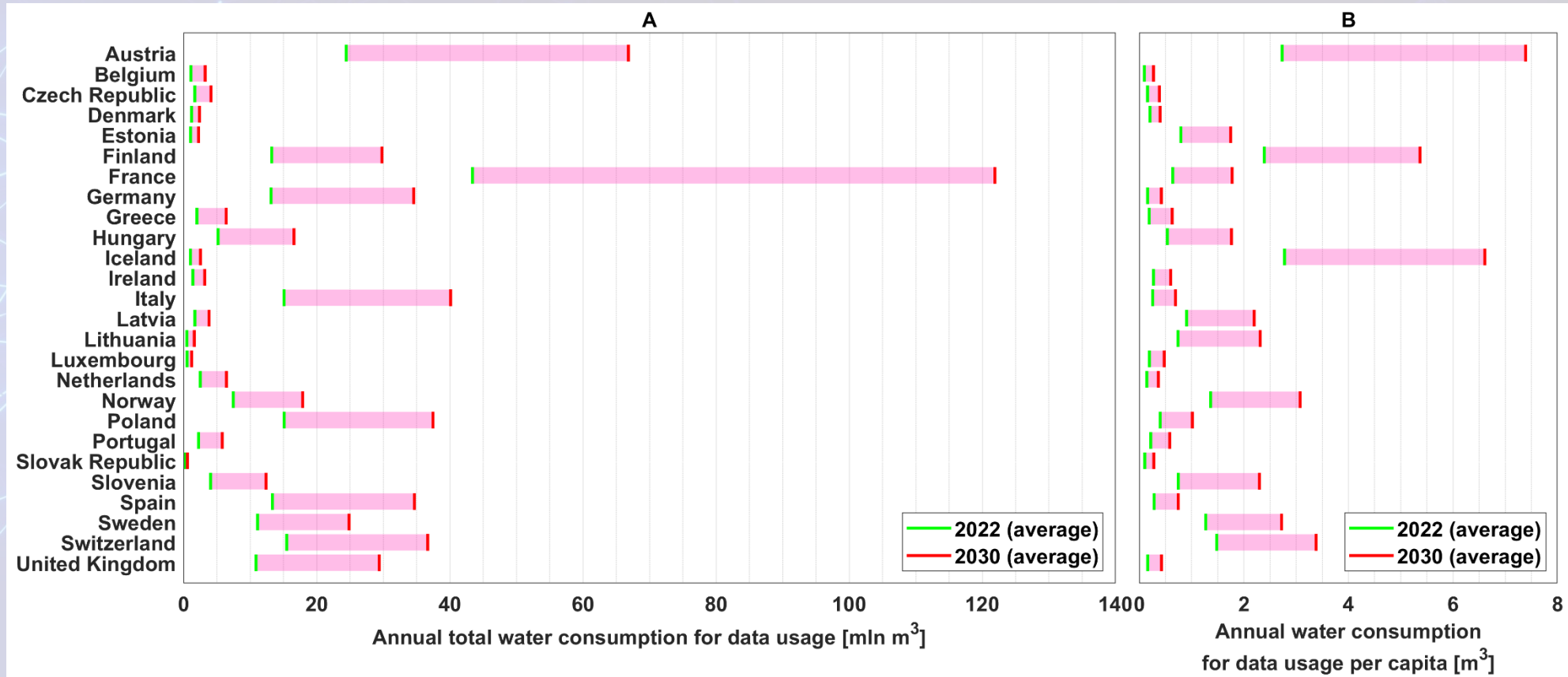Besides electricity, data centers require water for onsite cooling of their servers.

Power generation
Power plants use water to produce the electricity required to power data infrastructure.

Data = Water + Electricity

Looking ahead...

Current trends:

❑ The total water demand is estimated to reach around **550 million m³ yearly by 2030**

❑ This represents an average of over **1.1 m³ per year per capita by 2030**

Wait… there is water in my phone?

Your phone consumes today only between **3ml and 130ml of water per day** just in electricity

In contrast, and at the current rate, your internet usage will be consuming daily around **3 litres of water** by 2030

Human recommended daily water intake is around **2 litres per day**… and in a few years, **your phone may be "drinking" more than that!**

QUESTIONS?

Thank you for your attention!!!

References

- OECD, 2021. "OECD Broadband Statistics", https://www.oecd.org/digital/broadband/broadband-statistics/ (accessed January 2022).

- Farfan, J., Lohrmann, A. (2023). Gone with the clouds: Estimating the electricity and water footprint of digital data services in Europe. Energy, 290, p. 117225, doi.org/10.1016/j.enconman.2023.117225.

- Lohrmann A., Child M., Breyer C., 2021. "Assessment of the water footprint for the European power sector during the transition towards a 100% renewable energy system", Energy 233, 121098.