IEA Wind TCP Task 48

Work Package 1 Resource Potential & markets

System integration of Airborne Wind Energy. Quantifying grid balancing benefits and more

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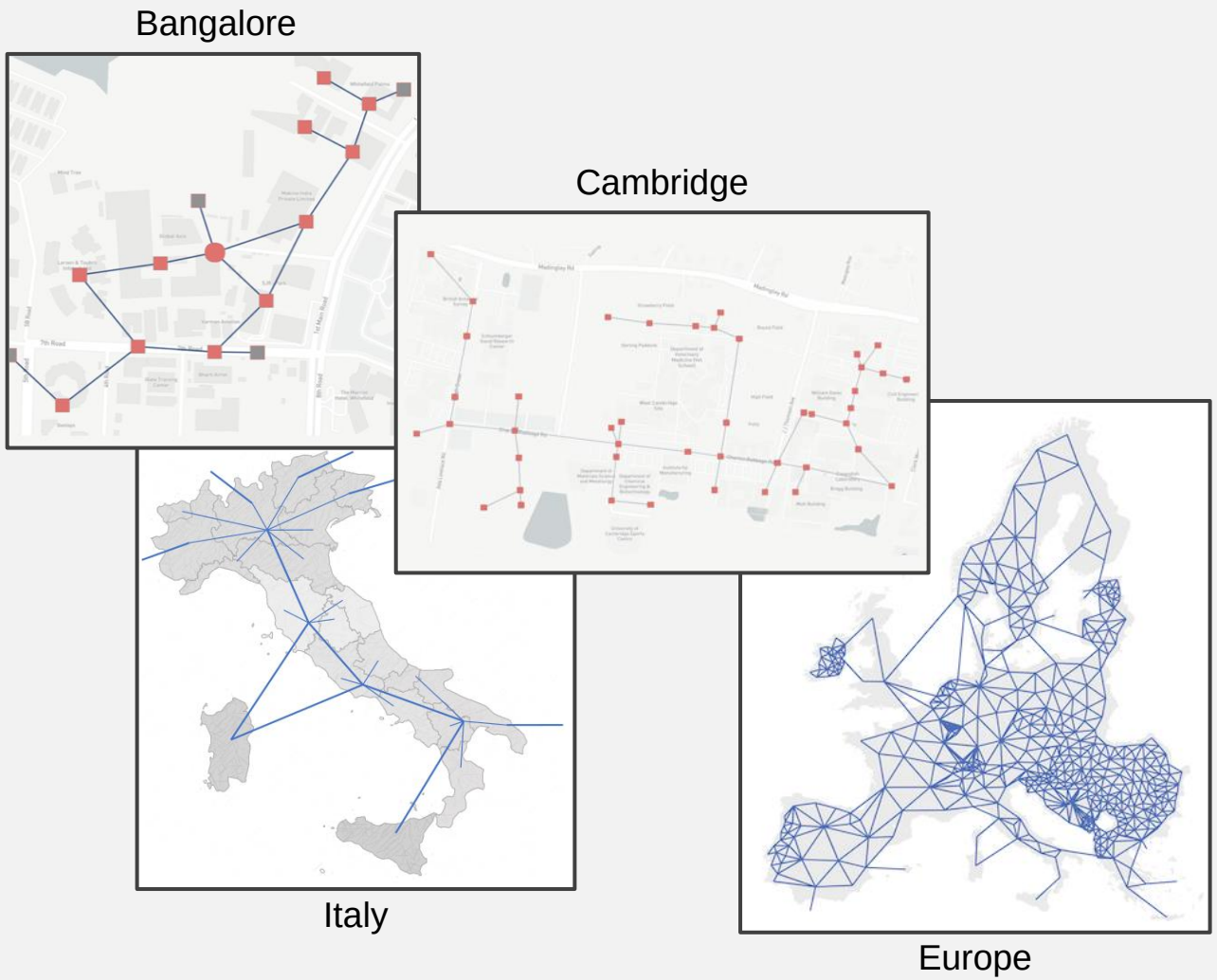
Energy and Industry section

TU Delft

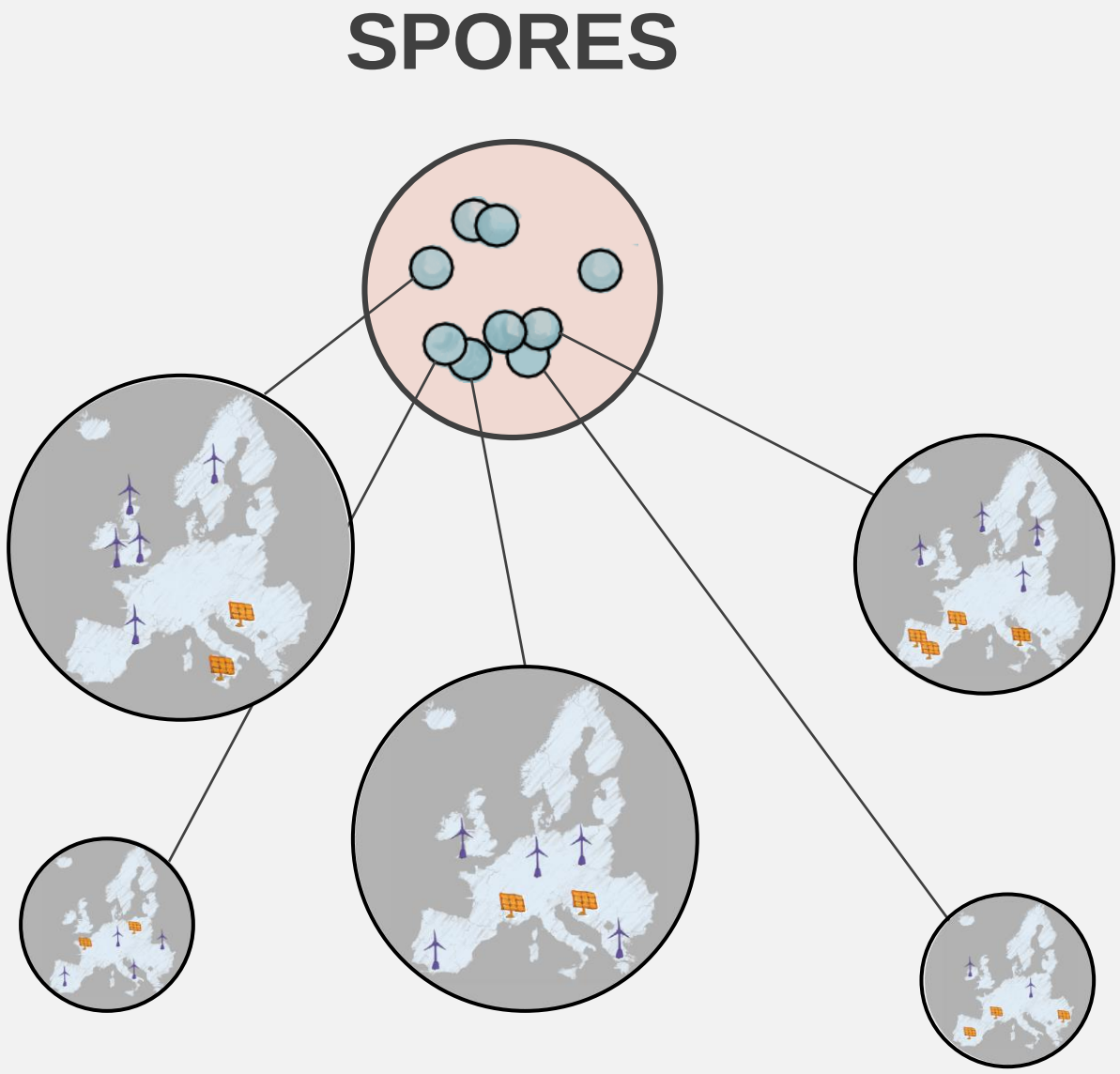
Calliope www.callio.pe

Our tools.
High-resolution system modelling



Our tools.

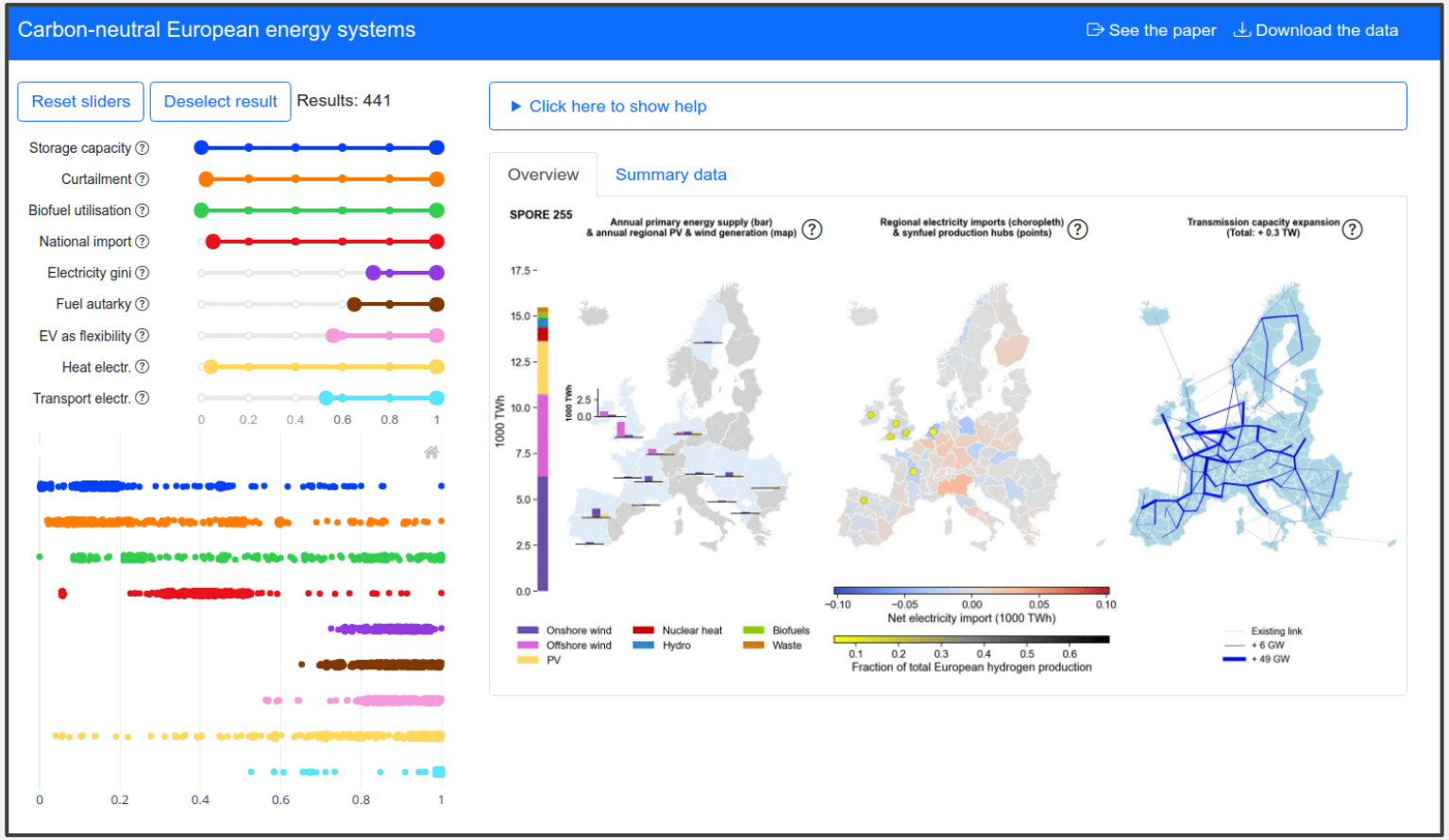
Discovering many viable design options



Lombardi, Pickering, Colombo, Pfenninger. *Joule.* 2020. doi.org/gg8z6v

Our tools.
Example output

441 feasible system designs for a fully carbon-neutral and self-sufficient Europe



Explore trade-offs yourself at **explore.callio.pe**

Pickering, Lombardi, Pfenninger. *Joule.* 2022. doi.org/10.1016/j.joule.2022.05.009

Airborne wind.

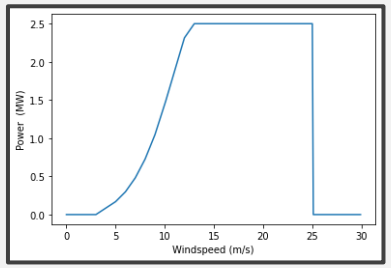
Three-year **Horizon Europe** project started Oct 22

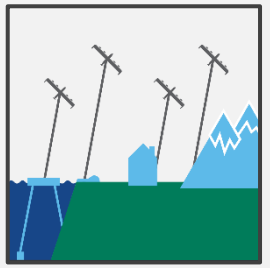
- Aims to **accelerate wind** energy deployment
- Looks at emerging technologies: **airborne**, floating
- Focuses on **justice** in the deployment of infrastructure

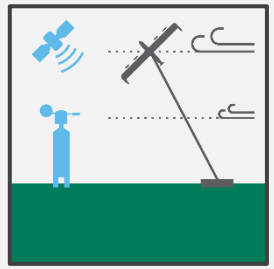
company/justwind4all

Airborne wind.
Modelling plan

Technology characterisation
Power curves, costs, potential, hourly capacity factors







Sketches by
Danielle Ceulemans

MSc thesis **Hidde Vos**, collaborating with Roland Schmehl's group

System integration
Implementation in a Calliope modelling environment

PhD student

Step 1. Proof of concept for a model of a Norwegian province ✓

Step 2. Integration in a model of the North Sea energy system **WIP**

Step 3. Europe-wide analysis, higher resolution on focus regions **from Mar 23**

Thank you.

Want to know more?
Get in touch!

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FrLomb

Francesco Lombardi

First results coming soon!

The Benefits of Integrating Airborne Wind Energy in Highly-Renewable Energy Systems
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