EMP
Energy Modelling Platform for Europe

EMP-E 2020 Wrap-up

Modelling Climate Neutrality for the European Green Deal

open ENTRANCE

plan4res

Magnitude

planet

Spine

SENTINEL

NAVIGATE

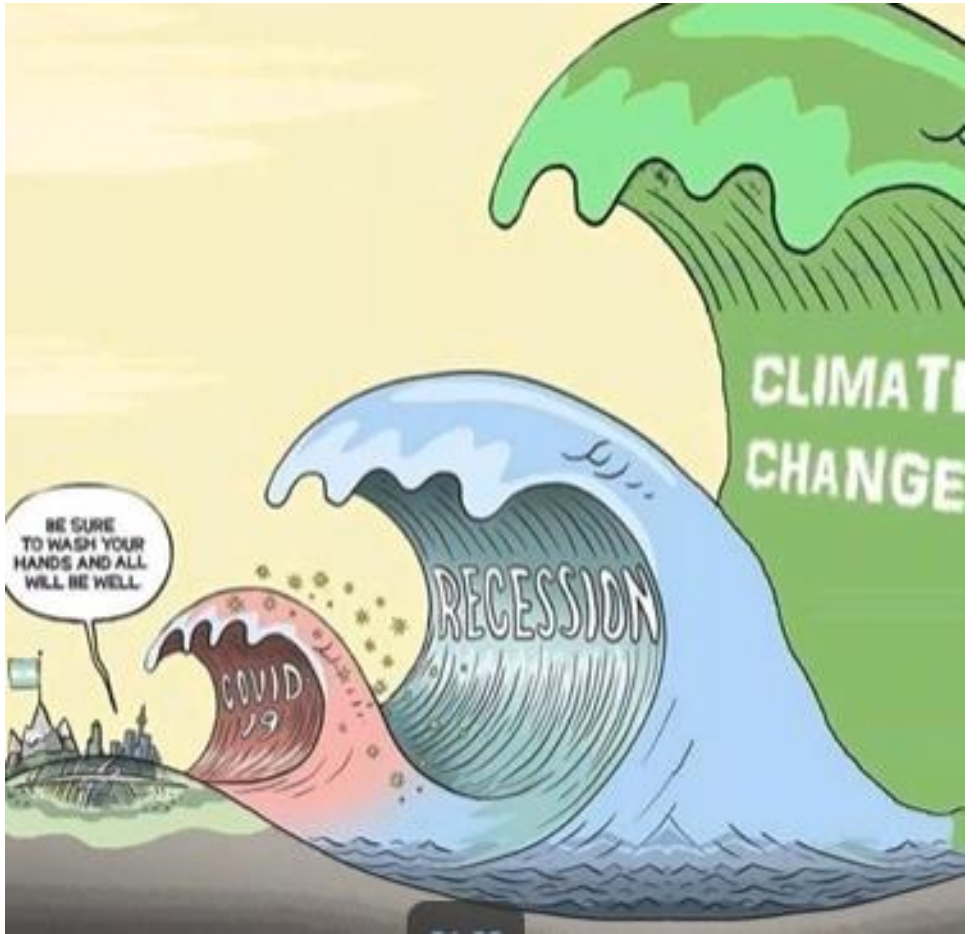
AURES II

PL1: Impact of covid-19 on the energy system – What are the consequences for the future energy system modelling?

1. **Large reductions in energy use during the pandemic**
2. **In France a ‘different’ energy world with lower demand, lower prices and fewer emissions**
3. **Key questions**

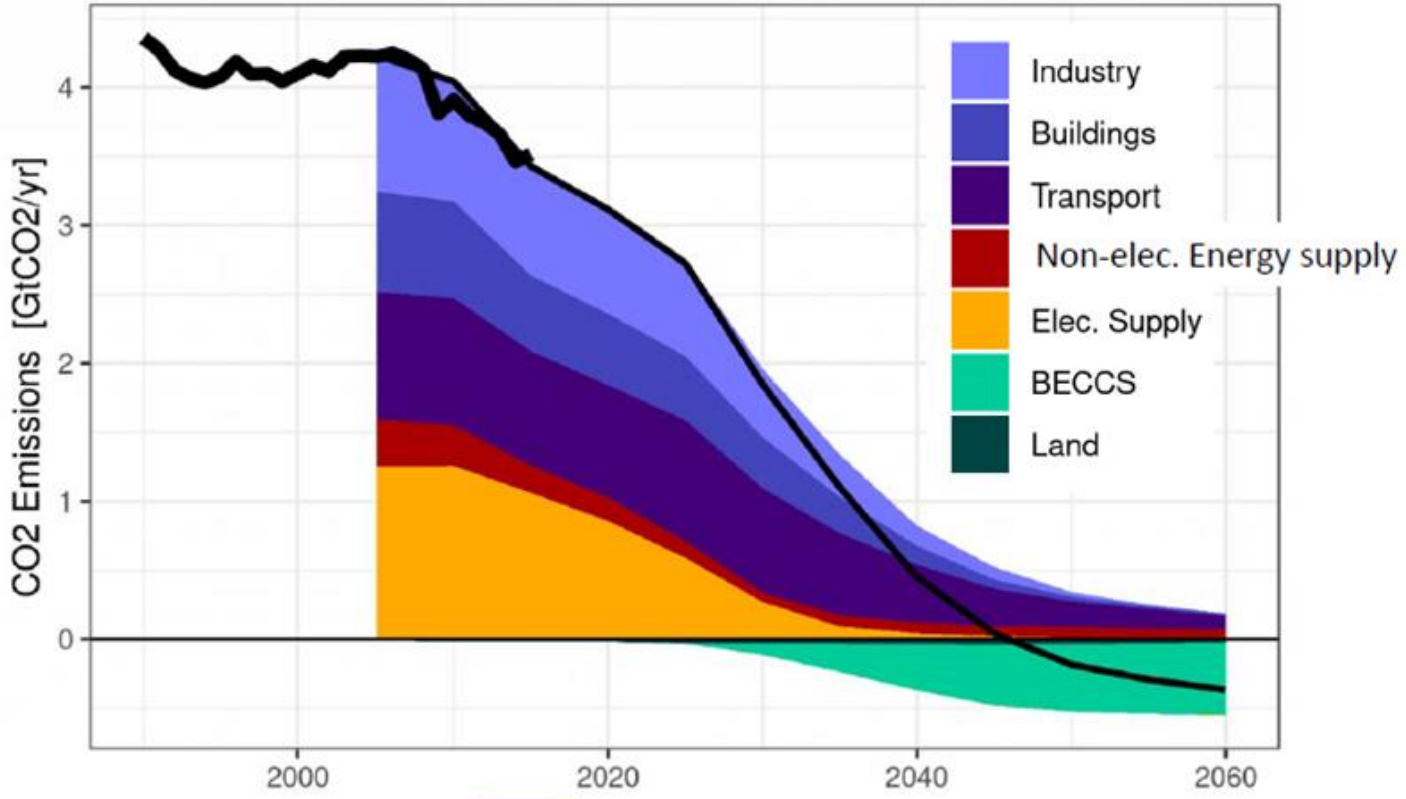
   Impact on the economy and the ability to invest in sustainable energy

   Changed structures of energy demand



PL 2 - Climate Neutral Pathways, scenarios and storylines: Useful lessons learned and strategies for the European Green Deal

- **Survey expectations**
- **Different studies show similar trends and confirm feasibility by 2050**
- **Key discussion points**
- **Main topics to improve models**



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821124.

FG1:- Climate Neutrality: energy modelling, weather and climate

- Challenges with high-resolution energy models
- There is a growing number of weather and climate data services for energy applications
- Critical issues at the energy-weather-climate boundary

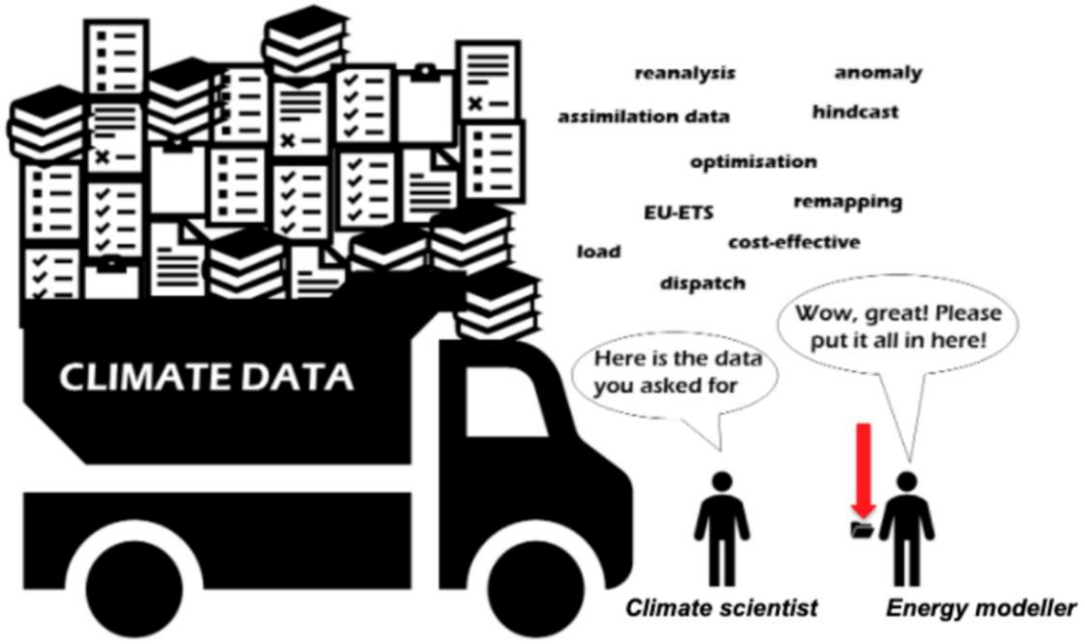
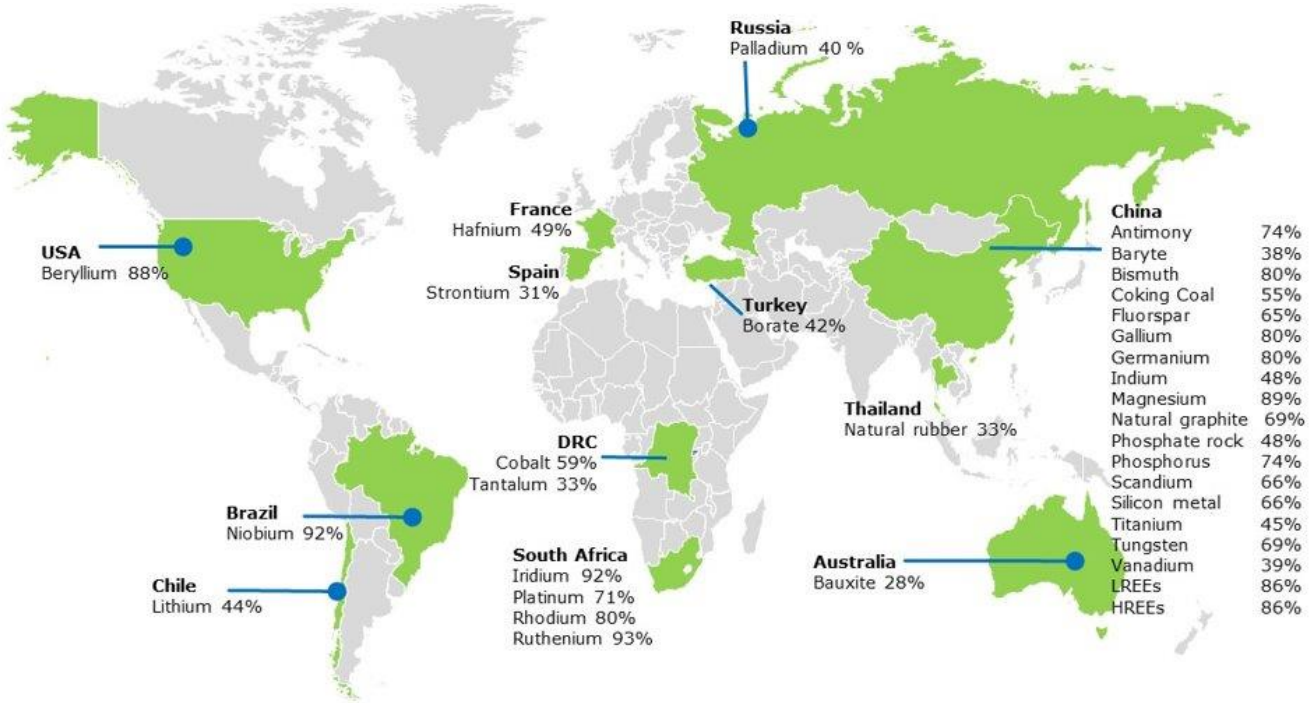


Figure from CLIM2POWER project.
As shown by Prof Simoes in Next Generation Challenges in Energy Climate Modelling workshop (June 2020).
Reproduced in Bloomfield et al (in press, Bull. Am. Soc)

FG 2:
Circularity, use of raw material

1) **Critical Raw Material dependent Economy**
2) A need of **data in a formalized format** usable by ESM
3) **Join effort** from **Academia** and **policy makers** to build more useful models



PL3 Socio and economic impacts of the transition

- Stakeholders in the EMP-E survey demand for better integration of economic and especially social impacts of the transition
- Key transition impacts addressed within the session include **social drivers and constraints, effects of inequality, and employment effects** – ranging from European to regional perspectives
- **Key discussion points**: importance of sound approaches, issues to tackle socio-economic dynamic, closer collaboration between social science and modellers to bring things forwards

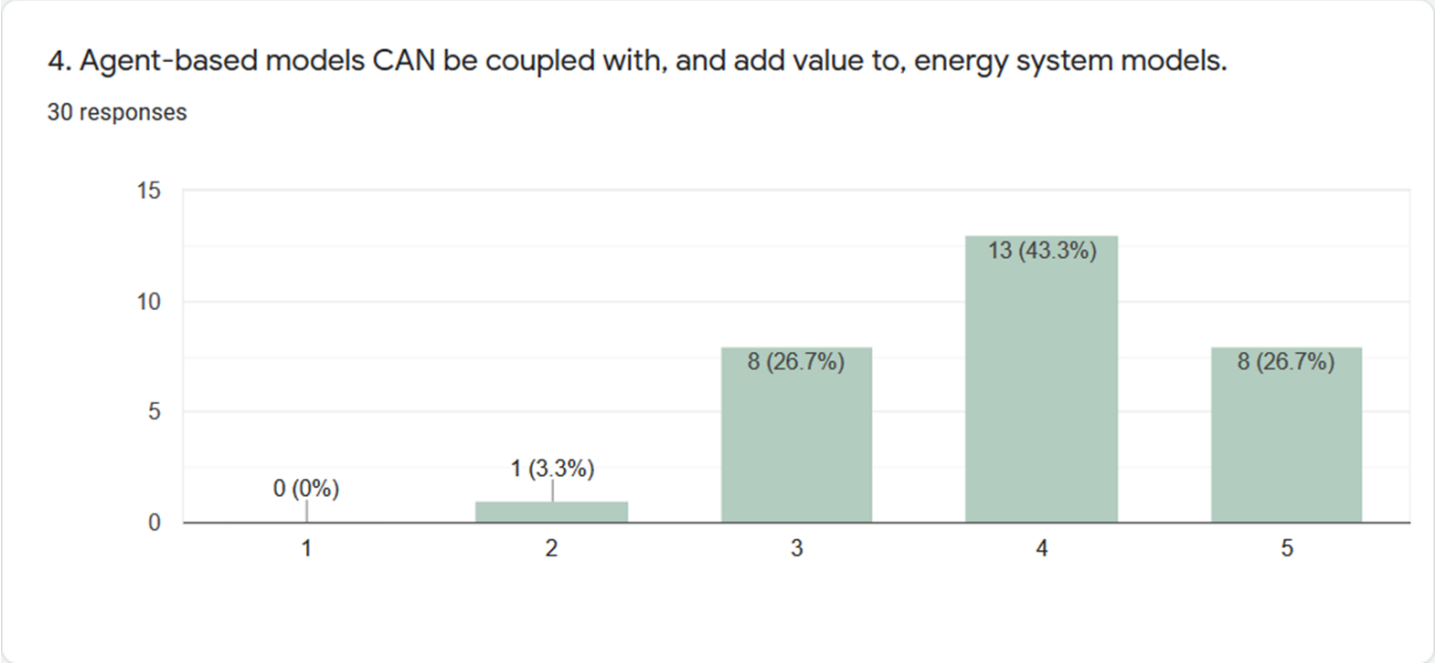
Pao-Yu Oei (TU Berlin), Diana Süsser (IASS Potsdam)

PL4:-Sector integration: decarbonization through multi-energy carrier

- Multi-energy systems
  - District heating systems
  - Customers - Energy communities
  - Mobility
- Cooperation on European level and between sectors

FG3:-Consumer and Citizen Engagement

1. **Surveys: agent-based models (ABM) can and should be linked to energy system models**
2. **ABM is most useful for exploring possible alternate realities within a well-defined context, less well suited for prediction**
3. **Challenges in linking ABM to energy system models**



FG4:- Smart cities, Smart grids and digitalisation

1. **Multi-energy systems**
2. **Renewables and flexibility resources in the cities**
3. **Electrification of transportation at city level**
4. **Evolution of the role of distribution system operators**

Focus Group 5: Infrastructure for integrating models to facilitate openness and transparency

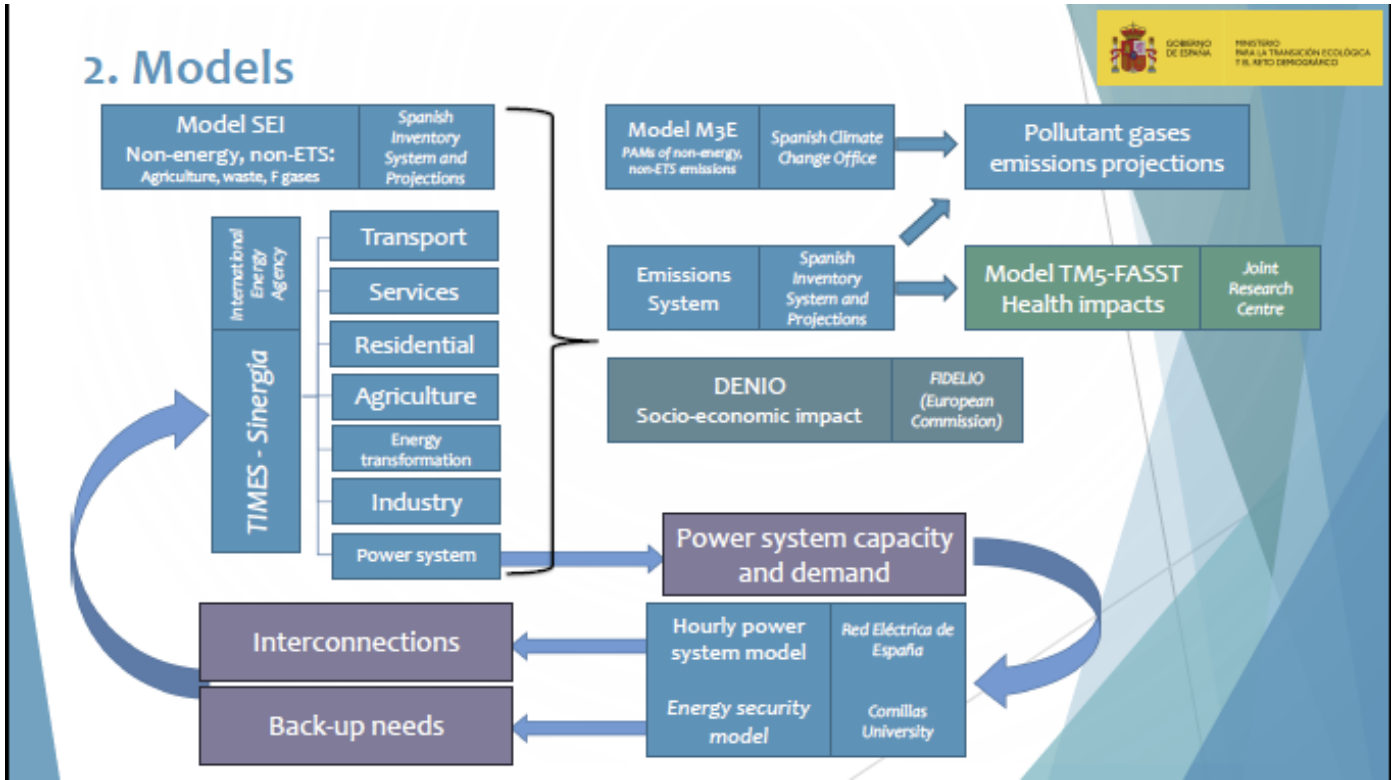
- Introductory presentations by four projects

- Insights from two break-out groups:
  - Parallel data models
  - Possibilities for incompatible data formats
  - Harmonization possibilities

- Key challenge: do not repeat the „curse of a thousand parallel solutions“

FG6:- How can Energy modelling tools contribute to NECPs?

1. More or less a continues process to develop NECPs
2. Formal requirements to an analytic foundation of the plans
3. A very structured approach for development of a NECP in Spain was shown
4. 7 tools of very different character were presented. They can be used for development and assessment of NECPs.



FG7:-Transformation of the Energy system: Centralisation vs decentralisation

- Decentralisation
  - A major trend
  - Coordination mechanisms required
  - Key challenge
  - Modelling tools essential

FG8:-Uncertainty and modelling: lessons learned and gaps

- **Planning-under-uncertainty optimisation frameworks** are fundamental for identifying **openings for strategic action**
- Capturing **short-term uncertainty** is crucial for long-term energy planning. In this case **statistical properties and correlations** matter more than predictive power when describing this uncertainty.
- **Flexibility** (such as storage) investment effective in dealing with **large uncertainty**
- **More efficient computational** and **decomposition algorithms** still need to be further developed to deal with a huge increase in the **size of optimisation problems** factoring in uncertainty