EERA VISION PAPER

TOWARDS A MORE COLLABORATIVE ENERGY SYSTEM MODELLING

FOR ADDRESSING EUROPE'S ENERGY TRANSITION CHALLENGES

WHY IS INTEGRATED AND COLLABORATIVE MODELLING CRITICAL FOR ADVANCING THE ENERGY TRANSITION?

Energy modelling is the navigation equipment guiding Europe's energy transition treacherous waters. In the ever-changing sea of the energy transition, where uncertainty and complexity are the only constant, **comprehensive and collaborative energy modelling is needed**.

Otherwise, the energy transition risks facing numerous additional challenges that can lead to **misguided investments**, which will further **delay** or even compromise attaining the objectives in the most **cost-effective** way.

WHAT ARE THE OPPORTUNITIES IF THE MODELLING PRACTICE IS EXPANDED OR ENRICHED?

Enabling **collaboration between European and national-level models and among European research institutes** can **enhance energy transition planning** through additional insights into the impacts of decisions on different actors, market functioning and financing.

Aligning **infrastructure planning** with European renewable energy ambitions (i.e., REPowerEU goals) can ensure that the **capacity needed is in place or that suitable measures are taken** to meet the requirements of the objectives.

Including a **broader range of (technology) solutions** can lead to **finding more cost-effective pathways**.

Introducing uncertainty and **broadening the range of energy scenarios** can reduce investment risk, accommodating various possibilities and outcomes and **fostering a more confident decision-making scenario** for industry and investors.

Including critical factors in the model, such as **supply chain challenges** (permitting times, growth, manufacturing capacity), can lead to better near-term projections. This ensures optimal utilisation of **real-world capabilities and proposes alternatives to bridge potential gaps** should a particular energy technology fall short of meeting projected growth.

HOW CAN THE RESEARCH COMMUNITY HELP?

The solutions are already there. The research community possesses a **wealth of models** that can enrich existing scenarios, offering **diverse pathways for the energy transition**, as well as **providing better projections** in terms of their potential impacts on the energy system.

WHAT DO WE NEED FROM POLICYMAKERS TO MATERIALISE THE HELP?

ENERGY MODELLING COMMUNITIES

Create **energy modelling communities** to facilitate dialogue among modellers, policymakers, and other stakeholders. These communities would encourage diverse assumptions and discussions on translating model results into practical policies, impacting industries, investors, and citizens directly.

A first action towards more dialogue can be to make **national modelling experts contribute to the scenario analysis of the European Commission** through a consultation process in the same way as national experts are contributing to the Reference Scenario.

OPEN-SOURCE MODELS

Mandate **open-source models and detailed data and assumptions** publication to enable collaboration between European and national-level models.

Policymakers should mainly promote this among EU-funded modelling exercises to ensure the accessibility and reusability of models funded by public money.

DATA HARMONISATION

Step up efforts to support **data harmonisation** initiatives so that they can become findable, accessible, interoperable and reusable (FAIR) by modellers, modelling communities and ideally by citizens.

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Based on Vingerhoets et al., 2023, EERA vision paper - Towards a more collaborative energy system modelling for addressing Europe's energy transition challenges. Available for download: www.eera-set.eu