

# How energy modelling influences policymaking and vice versa

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Energy models and energy policy influence each other. Credit: Shutterstock/Blue Planet Studio

Energy models are used to explore different options for the development of energy systems in virtual "laboratories". Scientists have been using energy models to provide policy advice for years. As a new study shows, energy models influence policymaking around the energy transition. Similarly, policymakers influence the work of modelers. Greater

transparency is needed to ensure that political considerations do not set the agenda for future research or determine its findings, the researchers demand.

Renewable energies bring many changes, including fluctuations in the [energy supply](#) and a more geographically distributed generation system. Despite the myriad uncertainties, politicians must make [important decisions](#) around the future development of the [energy](#) system. Key issues include the choice of technologies and the location of [renewable energy](#) infrastructure, the integration of the electricity, heating, transportation and industry sectors, as well as the balancing of interests of diverse stakeholders and population groups. A team of researchers has studied both the role of computer-based [energy models](#) in the [political decision](#)-making process and, conversely, how policymakers influence energy modeling.

## **Energy models inform policy decisions that shape our energy future**

The researchers analyzed a range of documents, including legislative texts, position papers and progress reports as well as secondary literature on political processes. They also conducted 32 interviews with various actors from politics, science, industry, and non-governmental organizations in Germany, Sweden, Poland, Greece and at the European Union level. "The results of this research clearly show that models help to explore possible energy futures. Their influence on policymaking is growing accordingly: politicians draw on modeling outputs to define energy and climate targets and study policy measures to achieve them," says lead author Diana Süßer.

Likewise, policymakers influence modeling, for example by helping to define research questions and the scope of studies, and by deciding how the results will be used. In interviews, however, policymakers suggested that modeling results were often too general for their purposes and left

specific questions unanswered. According to these respondents, models lack transparency, which can undermine the credibility of their results. The respondents said that they would like researchers to engage with them more closely so that models could be developed to address the issues relevant to policy development.

### **Modeling can help to shape the energy transition**

This interest in co-creative cooperation is welcome in principle, says Diana Süßer. Energy models are well-suited to tackle real-world issues and achieve societal impacts. "But it is vital that neither side loses sight of the fact that researchers are committed to generating knowledge, rather than to serving political ends. The transformation of the energy system is a complex challenge and, in terms of scientific policy advice, as much as politicians would like one, there is no 'silver bullet'.

Co-author Johan Lilliestam adds: "Models help us to understand the impacts of possible goals and policy options. What our study has shown is that they are sometimes also used to legitimize policy decisions that have already been made. Transparency, [open data](#) and open models are essential in order to protect the credibility of models and to improve their utility for policy advice." The IASS project "Sustainable Energy Transitions Laboratory," (SENTINEL) is developing a modeling framework for user-friendly models to improve cooperation between science and politics. Used properly, energy models can play an important role in the development and design of our future energy system and help us to achieve ambitious energy and climate goals.

**More information:** Diana Süßer et al, Model-based policymaking or policy-based modelling? How energy models and energy policy interact, *Energy Research & Social Science* (2021). [DOI: 10.1016/j.erss.2021.101984](https://doi.org/10.1016/j.erss.2021.101984)

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