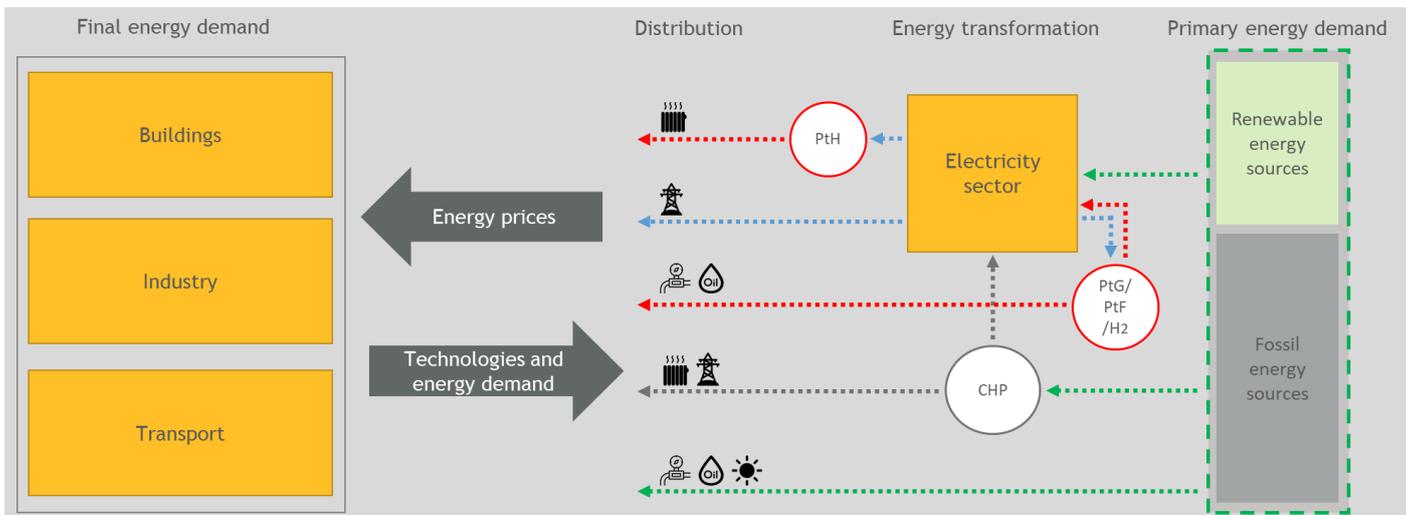


DIMENSION

The model

DIMENSION is a technology-rich simulation model for the European energy system. The years to be simulated and the temporal resolution can be freely specified. Currently, DIMENSION covers 28 countries, which coincide with the EU28. The individual power plants and storage capacities of these countries are characterized in the regularly updated in-house database.

The electricity market model optimizes the future development of power plants as well as storage capacities under emission reduction targets. In doing so, the model estimates the cost-minimizing dispatch and capacity expansion and withdrawal of various technologies. In particular, the deployment of renewable energy sources is considered within a cost-minimizing framework, taking into account the surrounding political circumstances.



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The end energy use sectors industry, buildings and transportation are modularly included, with the option of endogenous optimization or exogenous definition of transformation pathways. The power-to-X module allows for the coupled analysis of the power, heating and transportation sectors.

DIMENSION computes the total system costs (capital stock, generation, transformation and distribution), timely evolution of energy flows and prices, capacities of the European electricity market, generation mix and CO₂-emissions of heat and electricity provision by sectors, energy imports and ptx as well as many more key parameters for decision making.

DIMENSION is in use in several consultancy as well as research projects. The quality of the model is further assessed, improved and compared to challenger models in research experiments.

Purpose of the model

Possible applications

Price forecasts

DIMENSION provides forecasts for the day-ahead, intraday, and the balancing energy markets as well as network tariffs, EEG levy and other price components.

Asset valuation

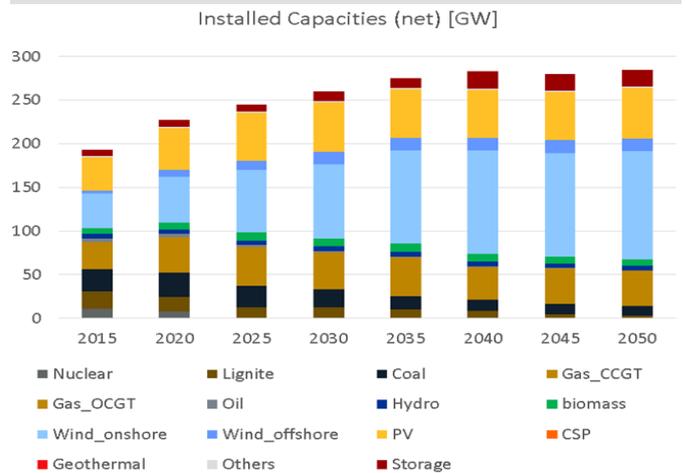
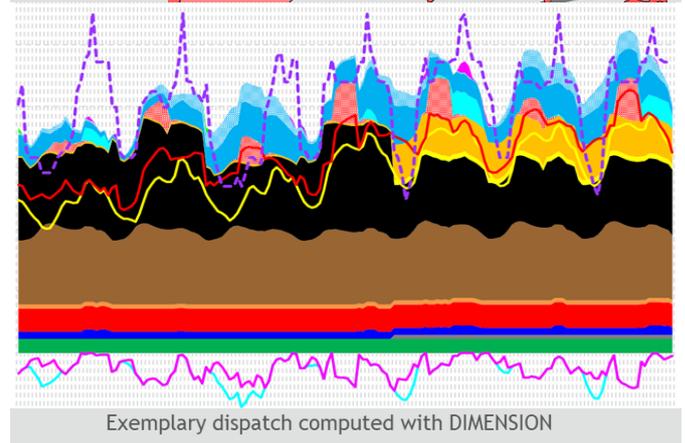
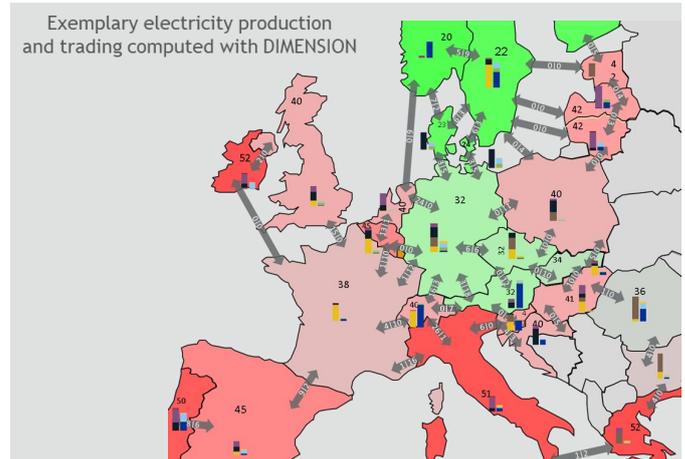
DIMENSION acts as an asset valuation and decision support tool regarding investment decisions for assets such as power plants and storage systems.

Strategies for grid analysis and regulation

DIMENSION allows the calculation of bidding zone configurations and their impact on power markets. Additionally, various congestion management mechanisms, redispatch, zonal pricing as well as nodal pricing can be analyzed.

Middle- to long-term scenario analysis

DIMENSION enables the analysis of the variation in political framework (CO₂ trading, support mechanisms for renewables and combined heat and power, coal exit) for middle- and long-term scenarios. An exemplary sector integration study performed with DIMENSION is the dena-Leitstudie integrierte Energiewende.



Exemplary capacity expansion computed with DIMENSION