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Hesse prepares for 100% renewable energy by 2050



The Hessian Ministry of Economy, Energy, Transport and Housing* wanted to create a sustainable, climate neutral and economically sensible energy future. To accomplish this, the Ministry turned to BearingPoint and Fraunhofer IEE to provide a viable plan for the transformation.

* Hessisches Ministerium für Wirtschaft, Energie, Verkehr und Landesentwicklung“ (HMWEVL)

The Hessian Ministry of Economy, Energy, Transport and Housing is headquartered in Wiesbaden, Germany, focusing on the federal state's wellbeing with a sustainable, ecological approach to development.

Making the energy transition for a sustainable future

The state of Hesse wants to meet the demand for electricity and renewable energy sources by 2050. This would imply transitioning from the region's share of 500 power generation units to over 2 million, using methods from wind turbines to solar roofs. Integrating such a large number of renewable energy sources requires a huge transformation of the state's electrical infrastructure.

Using innovation to plan the transformation

BearingPoint, together with Fraunhofer IEE, contributed to the planning of the energy future and estimated the efforts required for transformation of the grid.

They used innovative ways to generate scenarios automatically and plan the grid to cover the transformation at an unprecedented scale and depth. This generated ca. 3,780,000 grid plans and over 4.5 billion load-flow computations from approximately 920 real distribution grids.

There were 150 probabilistic distributions modeled for each scenario, including wind, photovoltaics, electric batteries, e-vehicle charging stations, and heat pumps. The team used a complementary approach, where conventional network expansion methods were combined with new strategies and equipment. Using this method, they identified the means to transform the electricity infrastructure in a cost-efficient manner.

Acquiring the clear route for the future strategy

The Hessian Ministry of Economy, Energy, Transport and Housing is now updating the energy transition strategy for a clean, carbon-free energy future. They have a clear forecast of the grid extension demands and costs, and a clear perspective on the potential improvements.

The recommendations provided by BearingPoint and Fraunhofer IEE indicated how the grids can be reinforced and extended with optimal costs. These have already been adopted by many grid providers in Hesse and throughout the country. Additionally, the Ministry now has a detailed foundation for its energy policy that allows it to complete its energy strategy.

Contact

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