

Multi-horizon Stochastic Planning on the European Power System

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An optimal planning of the energy transition is crucial to assess the right long-term investments. One important issue is considering the uncertainty about the future regarding multiple key parameters. In capacity expansion planning, managing long-term uncertainty together with short-term uncertainty has been a computational challenge. By using a multi-horizon approach, the model performs well for a suitable scenario size. The current capacity expansion model for the European power system considers several sources of long-term uncertainty: country electricity demand, fuel prices and CO₂ prices. The model outcomes show more sensitivity regarding long-term uncertainty than to short-term renewables energy generation. The stochastic solution shows that the decarbonization goals are achievable by expanding even more the low-carbon technologies and transmission capacities than in the deterministic solution.