Renewable Energy and its Impact on Power Markets

Abstract:
The widespread introduction of renewable energy production is transforming electricity markets all around the globe. The changes are often hard to anticipate for market participants and the resulting uncertainty about future market conditions, policy regimes, technologies, and prices makes participation in these markets risky. In this article, we focus on changes induced by the growing capacities of wind power and photovoltaic electricity production. We highlight some aspects of power markets that are currently changing fundamentally due to increased capacities in these technologies. In particular, we discuss technological development, predictability and stochastic modeling of wind and solar output, policy issues pertaining to subsidies for renewable energies, and effects on the electricity prices on spot markets. We illustrate our findings using data from Germany and the Californian electricity market.