

Henrik Madsen

Professor, Head of Centre

Technical University of Denmark

Department of Applied Mathematics and Computer Science

Forecasting for the Green Transition

The green transition implies that the power system will undergo a fundamental change from a system where the power production follows demand to a system where the demand follows the renewable power production. This implies that energy forecasting will play a central role in the green transition.

Today energy load forecasting is a rather easy task, but in the future demand response methodologies will become widely used and consequently demand and prices will become more volatile and less predictable. This talk will demonstrate that by taking account of auto- and cross-covariances when reconciling forecasts, the accuracy can be significantly improved.

In this talk also state-of-the-art methodologies for renewable energy forecasting will be described. In particular we will focus on methods for multivariate probabilistic forecasting of load and renewable power generation. It will be argued that tools for integrated forecasting across domains (wind, solar, load, prices, ...) will become essential, and replace more silo-oriented and independent tools for individual areas like wind power. It will be demonstrated that full multivariate probabilistic forecasts will become essential to obtain reliability and profitability in the operation of future low-carbon energy systems.