Economic Impacts of Advanced Weather Forecasting on Energy System Operations

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We analyze the impacts of adopting advanced weather forecasting systems at different levels of the decision-making hierarchy of the power grid. Using case studies, we show that state-of-the-art numerical weather prediction (NWP) models can provide high-precision forecasts and uncertainty information that can significantly enhance the performance of planning, scheduling, energy management, and feedback control systems. In addition, we assess the forecasting capabilities of the Weather Research and Forecast (WRF) model in several application domains.