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Short bio:

Stein-Erik Fleten received the Ph.D. degree in operations research from the Norwegian University of Science and Technology, Trondheim, Norway, in 2000.

He is currently Professor at the Norwegian University of Science and Technology, Trondheim, Norway. His areas of interest include electricity markets, hydro scheduling under uncertainty, hedging and risk management in electricity utilities, real options, and bidding in short-term electricity auctions. His main scientific fields are stochastic programming, finance and energy economics, with applications for electricity companies. He has been doing research on the liberalized electricity market since the 1990s. He has been a visiting scholar in University of British Columbia, University College London and University of Michigan. Fleten has extensive experience in participation and leadership of applied research projects, both nationally and internationally, within the electricity area.

Keynote title:

Offering of storage-backed power into short-term electricity markets

Abstract:

Operators of storage-backed power generators need to schedule their purchases and sales in wholesale electricity markets. The main European market for physical electricity is the day-ahead market. Examples of storage-backed power include pumped hydro, reservoir hydropower, and battery energy systems. This talk will view the bidding problem of such producers as an application of stochastic programming.

There is uncertainty in both spot market prices and, for reservoir hydro, inflow to the reservoirs. The presence of storage also means that the short-term problem of determining bids for the next 12-36 hours may also be a part of a long-term problem in which the question is whether to release water now or store it for the future. On the other hand, one can participate in ancillary services markets that typically happen closer to real time. This multi-scale challenge is usually addressed by using several tools in a chain. A major research question is whether coordination of bidding across these markets pays off. The talk will discuss construction of market price scenarios and explain the development of stochastic mixed-

integer linear programming models that takes in both production and physical trading aspects. The cases are illustrated with data from Norwegian electricity generators and the Nordic power market at Nord Pool.