Thursday, Oct. 25th
Scaife Hall Auditorium
Room 125 at 4:30 p.m.
Refreshments at 4:00 p.m.

Boris Defourny, Ph.D.
Associate Professional Specialist
Department of Operations Research and Financial Engineering
Princeton University

Dr. Boris Defourny is an Associate Professional Specialist at Princeton University, in the Department of Operations Research and Financial Engineering. He received his PhD in December 2010 from the University of Liege, in Belgium. His main research interests lie at the interface of stochastic optimization and machine learning, and more broadly in approximation methods that lead to robust solutions while being computationally efficient. He is also actively participating to several collaborative research projects as a scientific advisor, all related to current challenges and debated questions in energy systems and energy markets, such as demand response or large-scale wind integration.

New computational techniques for the stochastic unit commitment problem

The growth of intermittent generation in the energy mix poses new challenges to unit commitment, in large part because energy from wind may remain highly uncertain at the time where ignition decisions for steam plants must be implemented. Recently, there has been a growing interest in stochastic optimization models for unit commitment, but at this stage it is not clear how these intractable models can be exploited by large system operators.

In this seminar, I will talk about ongoing work on a simulator we are building for evaluating unit commitment strategies in a way that complies with the dynamics of the information available to the system operator when decisions are optimized.

Then I will discuss approaches that we have identified as the most promising for improving, in a computationally practical way, the robustness of unit commitment decisions in face of high-dimensional uncertainty. I will first present an efficient technique for determining a single planning scenario that can significantly reduce the value of the stochastic solution (VSS) of the stochastic MIP model. I will also discuss the idea of optimizing several reserves for hedging against wind uncertainty, by accurately solving auxiliary stochastic programs posed on aggregated models.