CIRRELT

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Séminaire conjoint CIRRELT-HEC Joint Seminar

Département de la gestion des opérations et de la logistique

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Modeling and solving a stochastic generation and transmission expansion planning problem faced by the French Transmission System Operator

Abstract: In this talk, we discuss how a regulatory constraint limiting a measure of unserved demand can be incorporated into a strategic version of the stochastic generation and transmission expansion planning problem faced by the French Transmission System Operator RTE. We show that a direct inclusion of the constraint into the extensive form of the two-stage stochastic problem leads to a formulation that violates the time-consistency principle. To obtain a valid model, we use bilevel programming and introduce a formulation in which the leader and follower have the same objective function. To solve this formulation, we propose a matheuristic that embeds a Benders decomposition algorithm in a binary search on the total investment cost. We performed computational experiments studying the practical difficulty of the problem and validating the solution method. Our experiments show that solving the single-level reformulation obtained using the KKT complementary conditions is intractable in practice, even for small-size instances, and that a simple heuristic procedure is not sufficient to compute feasible solutions.

Aurélien Froger is an associate professor at the Université de Bordeaux. He is also member of the Institut de Mathématiques de Bordeaux and of the EDGE Research Team.

Mardi / Tuesday

30 avril 2024, 10 h 30

April 30, 2024, 10:30

HEC, Édifice Sainte-Catherine

Salle / Room BUDAPEST

1er étage, section verte

1st Floor , Green section

Ouvert à tous / Open to all

Responsable / Organizer

Jorge Mendoza

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