Séminaire conjoint CIRRELT et CRI2GS

CIRRELT

CRI²GS
Centre sur l'intelligence² en
gestion de systèmes complexes

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Solving the Hydrogen Infrastructure Planning Problem Under Uncertainty

Abstract:

Hydrogen is considered a solution to decarbonize the transportation sector, an important step to meet the requirements of the Paris agreement. Even though hydrogen demand is expected to increase over the next years, the exact demand level over time remains a main source of uncertainty. We study the problem of where and when to locate hydrogen production plants, which have to be established before customer demand is known. We formulate our problem as a two-stage stochastic multi-period facility location and capacity expansion problem. The first-stage decisions are related to the opening of new facilities including modular capacities and a specific short-term cost function for each capacity level. In the second stage, decisions regarding capacity expansion and demand allocation are taken. Given the complexity of the formulation, we solve the problem using a Lagrangian decomposition heuristic. Our method is capable of finding solutions of sufficiently high quality within a few hours even for instances too large for commercial solver. We apply our model to a case from Norway and design the corresponding hydrogen infrastructure for the transportation sector.

MERCREDI / WEDNESDAY

16 novembre / November 16th, 2022

11h00

Salle / Room R-M180
Pavillon des sciences de la gestion
ESG-UQAM

Ouvert à tous / Open to all

Organisateur / Organizer

Sanjay Dominik Jena

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