Session MC86 - Towards Fully Integrated Energy Systems: From Long-term Planning to Short-term Operations

Add to Itinerary

3 - Benders Decomposition With Adaptive Oracles For Large Scale Optimization

October 21, 2019, 2:10 PM - 2:30 PM | S- Ravenna C

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Abstract

We propose an algorithm to solve large stochastic investment planning problems for power system expansion, where subproblems differ in right-hand side and cost coefficients. Similar problems are often tackled using cutting-plane algorithms, which may slow down severely when solving subproblems is computationally expensive. We propose two adaptive oracles that yield inexact information much faster than solving the subproblem. The first oracle generates inexact but valid cutting planes, and the second oracle gives a valid upper bound of the true optimal objective. These adaptive oracles are embedded within a Benders algorithm to substantially reduce the effort to obtain a ε-optimal solution.