Demand response with stochastic renewables and inertial thermal loads

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Abstract

We consider the problem of employing demand response to utilize stochastic renewables in supporting inertial thermal loads. We address the twin problems of how to support the requirements of the loads, while minimizing the need for costly spinning reserves. We address several issues including thermal desynchronization of the loads, load aggregation, privacy considerations, and information architecture. On the theoretical side we identify several issues related to convexity/concavity of certain optimal control problems involved, and simplified thermostatic control policies. [Joint work with Gaurav Sharma and Le Xie].