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Regulating Power Distribution in Energy Networks

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Abstract

We present a resource allocation mechanism for regulating a free energy market, in which the infrastructure is managed by a central authority while several competing energy providers distribute power to customers. Our mechanism enforces an incentive-compatible pricing scheme for the usage of the shared resources that is robust against the unknown incentives of the energy providers and assures convergence to a fair and socially optimal (utilitarian) solution. In case of disruptions, our mechanism can be used as an online recovery scheme causing the system to re-converge to its optimum very fast.