

What Duality Theory Tells Us About Giving Market Operators the Authority to Dispatch Energy Storage

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There is a debate about which entity should have the authority to dispatch energy storage that participates in restructured wholesale electricity markets. Some stakeholders raise concerns that market operators' independence can be threatened if they make operational decisions for energy storage. The rationale that underlies this concern is that operating energy storage can affect the balance of the system and price formation. We demonstrate that having market operators make operational decisions for energy storage does not change the fundamental nature of the optimal-power-flow problem. Using duality theory, we show that if market operators co-optimize the operation of energy storage with that of generators and transmission, the optimal-power-flow problem yields short-run dispatch support and incentive compatibility and long-run efficiency. These findings are analogous to those for having market operators co-optimize transmission use with generator dispatch. Our work suggests that concerns around giving market operators the authority to dispatch energy storage are misplaced.

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