## **Optimizing storage siting, sizing and technology portfolios in transmission-constrained networks**

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Abstract— In this paper we propose a DC OPF framework for storage portfolio optimization in transmission constrained power networks. In particular, this model is designed to investigate two problems: (i) optimizing storage operation and allocation over a network given a fixed technology portfolio and (ii) optimizing the storage portfolio (i.e., the size, technology and network allocation of these resources). We demonstrate this framework using case studies based on the IEEE 14 bus test system with four different storage technologies. Our results show that although certain technologies are generally classified as being suitable for either power or energy services, many technologies can add value to the system by performing both fast-time scale regulation (power) and load-shifting (energy) services. These results suggest that limiting the type of service that a certain technology is compensated for may result in inefficiencies at the system level and undervaluation of storage.

Index Terms— Energy storage; Electric power grid; Linear programming; Optimal power flow; Optimization

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