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Managing electric flexibility from Distributed Energy Resources: a review of incentives for market design

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Abstract-

In many electric systems worldwide the penetration of Distributed Energy Resources (DER) at the distribution levels is increasing. This penetration brings in different challenges for electricity system management; however if the flexibility of those DER is well managed opportunities arise for coordination. At high voltage levels under responsibility of the system operator, trading mechanisms like contracts for ancillary services and balancing markets provide opportunities for economic efficient supply of system flexibility services. In a situation with smart metering and real-time management of distribution networks, similar arrangements could be enabled for medium- and low-voltage levels. This paper presents a review and classification of existing DER as flexibility providers and a breakdown of trading platforms for DER flexibility in electricity markets.

Index Terms- Demand side management; Power markets; Demand response; DR; Demand flexibility; Distributed Generation; DG

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