

From distribution networks to smart distribution systems: rethinking the regulation of European electricity DSOs

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Abstract— Distributed energy resources allow for new business models that have the potential to substantially change today's power system functioning paradigm. In particular, these changes pose challenges for distribution system operators (DSOs) and their regulation alike. This article sheds light on missing aspects in current regulation, recognizing DSOs as regulated monopolies, but also as key players along the supply chain. We provide insights on how regulation should be adjusted so that DSOs are incentivized to facilitate the market entry of welfare-enhancing technologies in a timely fashion, and to manage the distribution system efficiently in the presence of distributed energy resources.

Index Terms— Electricity distribution; Smart grid; Regulation; Distribution system operator

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