

Restructuring revisited part 1: competition in electricity distribution systems

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Abstract-

This paper addresses the implications of the emergence of distributed energy resources (DERs) for competition in the electricity distribution systems. The regulations on industry structures in place today were designed in an era characterized by centralized resources and relatively price inelastic demand. In light of the decentralization of the power sector, regulators and policy makers must carefully reconsider how industry structure at the distribution level affects competition, market development, and cost efficiency. We analyze the economic characteristics of distribution network owners and operators, DER owners, and aggregators and retailers. We translate the foundational theories in industrial organization and the lessons learned during the previous wave of power system restructuring to the modern context to provide insight into three questions. First, should distribution system operations be separated from distribution network ownership in order to ensure the neutrality of the DSO role? Second, should DNOs be allowed to own and operate DERs, or should DER ownership be left exclusively to competitive actors? Third, does the emergence of DERs necessitate a reconsideration of the role of competition in the provision of aggregation services such as retailing? This paper is the first part of a two-part series on competition and coordination in rapidly evolving electricity distribution systems.

Index Terms- Competition, Coordination, Restructuring, Vertical integration, Distributed energy resources, Distribution, Transmission, System operation, Networks, Retailing, Aggregation

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