

Implementation Experience of Wholesale Electricity Markets in the North American Context

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Abstract:

Subsequent to the National Energy Policy Act 1992, which paved the way for deregulation of electricity, Whole-sale Electricity Market Systems have been around in North America for about a couple of decades. Independent System Operators (ISOs)/Regional Transmission Operators (RTOs) operate these markets, with the prime objective of ensuring reliability of power supply, while administering market rules in a fair manner. It is basically a wedding of laws of Physics and Economics. While it can be said that the markets have performed fairly well in meeting their objectives with a few hiccups, of late, the challenges of ISOs/RTOs have grown enormously. The challenges can be broadly classified to come from the following sources:

- New actors on the energy landscape – renewables, Distributed Energy Resources (DERs), advances in grid technologies, fuel shifts
- Organization driven changes - fuelled internally through changes to footprints, desires to create new member services or other member-driven initiatives

A whole-sale electricity market system is a pretty complex system, consisting of several component systems such as Energy Management System, Market Management System, Settlements & Billing, being the prominent ones. The entry of renewables, DERs, advances in grid technologies necessitates several changes to these systems in terms of modelling and implementation of operational/market rules. The second category of challenges is driven internally by ISOs/RTOs, to meet the aspirations of their market participants to allow for new markets/services. Summarizing, though it may appear that whole-sale markets have fairly matured for the past two decades, the rate of change has not slowed down and the inertia of current implemented systems seems to slow down that change. To meet these challenges and to make the solutions flexible, easily deployable, secure, resilient, it is time to implement Next Generation Market Systems, taking advantage of current advances in Information Technology and GE has embarked on that path.