Attribution mechanisms for ancillary service costs induced by variability in power delivery - DTU Orbit (19/03/2019)

**Attribution mechanisms for ancillary service costs induced by variability in power delivery**

The increased penetration of renewable energy sources in existing power systems has led to necessary developments in electricity market mechanisms. Most importantly, renewable energy generation is increasingly made accountable for deviations between scheduled and actual energy generation. However, there is no mechanism to enforce accountability for the additional costs induced by power fluctuations. These costs are socialized and eventually supported by electricity customers. We propose some metrics for assessing the contribution of all market participants to power regulation needs, as well as an attribution mechanism for fairly redistributing related power regulation costs. We discuss the effect of various metrics used by the attribution mechanisms, and we illustrate, in a game-theoretical framework, their consequences on the strategic behavior of market participants. We also illustrate, by using the case of Western Denmark, how these mechanisms may affect revenues and the various market participants.

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