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## **A Sketch of Unwanted Gaming Strategies in Flexibility Provision for the Energy System**

**Abstract.** Market-based procurement of system services is underway. Flexibility markets, however, are subject to a gaming risk. Different market participants can deteriorate the grid condition by their market behavior or physical actions, to generate flexibility demands and therefore potential profits, resulting in unreliable and unstable grid operation or economic inefficiencies. Such strategies are referred to as gaming. We investigate three gaming strategies regarding congestion management, reactive power management and balancing power provision. Further, we evaluate these strategies, and discuss solution techniques.

**Keywords:** Ancillary services, energy services, flexibility markets, inc-dec gaming, baseline scenarios.

### **1 Introduction**

In the framework of the digital transformation of the energy sector and increasing decentralized feed-in of renewable energies, the provision of system services to ensure power system reliability, adequacy and stability will be a significant challenge for the next decades. A trend of market-based procurement mechanisms is further reinforced by the Clean Energy Package of the European Union [1, 2]. However, flexibility markets lead to gaming potential in congestion management, reactive power management, and balancing reserve. Unit operators can act strategically to create problems in the power system and profit by providing the flexibility to solve the self-induced problem. As main contributions, we present three gaming variants, perform a comparison, point out pilot projects and legal aspects with regard to monitoring as a countermeasure. The execution of gaming strategies can result in economic inefficiencies and hazards to the critical infrastructure. Research demand arises