# Simplified Market Mechanisms for Non-Convex Markets: Evidence from Italian Electricity Market

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**Abstract**

We study the incentives for inefficient behavior by suppliers created by a simplified day-ahead electricity market design currently in place throughout Europe that ignores non-convexities in generation unit and transmission network operation. We show that suppliers systematically alter their offers into the day-ahead market to increase the profits they earn from the energy they ultimately produce in real-time based on the likelihood they are called to operate in a pay-as bid re-dispatch process. The cost of these re-dispatch actions averaged approximately 15% of the total cost of energy consumption valued at the day-ahead price and are likely to increase as the amount of intermittent renewable capacity grows. A counterfactual market design that accounts for many of these non-convexities where suppliers submit offer prices that are 140 percent of their marginal costs during peak hours of day yields similar average wholesale energy costs to consumers to the existing simplified market design.

**Keywords:** Zonal electricity markets, Strategic offer behavior, Re-dispatch market power

**JEL Codes:** L1, L9, Q4

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