

Equity in Demand Response: Designing Balanced Incentives for Power Grid Efficiency

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Abstract

Demand response programs are designed to shift electricity usage from peak to off-peak periods, typically through pricing strategies or financial incentives, to better align supply and demand. In this study, we explore equitable incentivization policies within these programs by accounting for the diverse characteristics of various demographic groups. We model the trade-offs between efficiency and equity in these policies and propose mechanisms that maintain efficiency while promoting social equity across different customer profiles. The findings are expected to offer utility companies actionable insights for refining their demand response strategies, fostering a more sustainable and fair energy management system.

Keywords

Equity, Response, Balanced Incentives, Power Grid Efficiency