

Fair Peer-to-Peer Energy Trading Considering Uncertainty

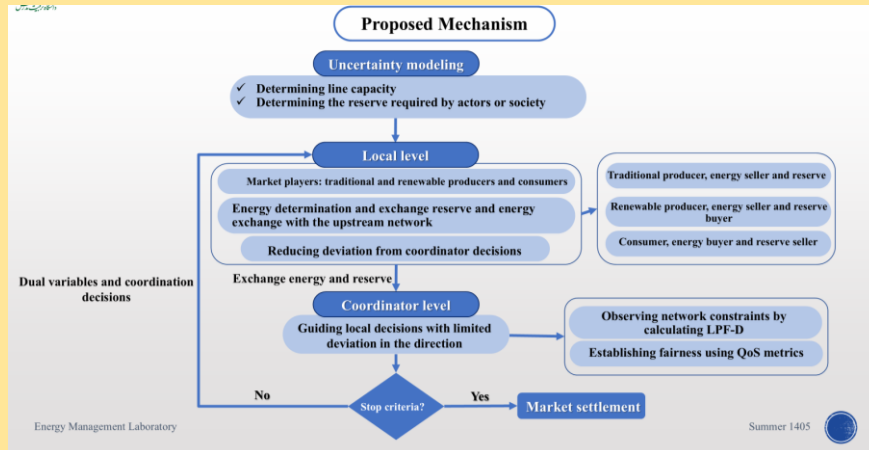
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Methods

In this study, local energy markets with decentralized settlement are simulated considering the uncertainty of renewable generation and power grid constraints. Then, using a regulatory approach in these markets, fairness indicators are improved.



Outcomes

- More realistic estimation of operating conditions by simultaneously modeling generation uncertainty and transmission capacity
- Determination of required reserves based on real characteristics and not just standard models
- Establishing a proper balance between operational security and economic efficiency using chance constraints
- Separating local decision-making of actors from the global coordination process without disclosing private information
- Similar performance to chance constraints approach
- Suitable for expansion and scalability
- Reducing opportunistic behaviors by using fairness indicators while maintaining economic efficiency
- Ability to be implemented in both P2P and hybrid mechanisms
- More flexibility of the hybrid mechanism due to the presence of an energy community management layer

