# ICFNDS'21 Submission 28

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| Submission 28 | |
|---|---|
| Title | Effect of Variability of Orders in an Auction-based Local Energy Market |
| Paper: | 📂 (Nov 17, 10:40 GMT) |
| Author keywords | Power network<br>Local energy market<br>Utility maximisation<br>Auction-based market<br>Market equilibrium |
| EasyChair keyphrases | local energy market (158), auction based lem (142), energy trading (110), community pool (110), equilibrium price (100), local energy (86), auction based local energy (80), minimum offer price (79), maximum bid price (79), net zero carbon (79), auction based market (79), market mechanism algorithm (63), high asking price (63), peer energy (60), social welfare (60), equilibrium point (60), submitted bid (60), supply quantity (60), unitary benefit (60), energy market (50), demanded quantity (50), double auction (50), low price (50), offer offer offer (47), bid bid bid (47), market clearing (40), market mechanism (40), network constraint (40), peer electricity (40), smart grid (40) |
| Abstract | To achieve a community pool towards net-zero carbon, this study explores the variability of submitted bids and offers in an auction-based local energy market (LEM). As these variables are correlated with the economic and environmental benefit of the market participants, equilibrium is desired. Specifically, we performed a comparative study of a variety of submitted prices and demanded/supplied quantities in an auction-based LEM. The results show that the unitary benefit derived by prosumers increases when there is equal or a balance of quantity and price offerings in the market. However, a high asking price and an excessive amount of energy supply in the market requiring grid balancing resulted in higher cost, which is not a desirable scenario. Thus, to achieve equilibrium and community-pool towards net-zero carbon, a LEM with balanced bids and offers is desirable to attract more active participation. |
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## Reviews

| Review 1 | |
|---|---|
| *Overall evaluation* | **1**: (weak accept)<br>This work explores the variability of submitted bids and offers in an auction-based market to determine their impacts on the benefit derived by the participating prosumers. This paper also presented a comparative study of different prices, quantities, bids, and offers in the auction-based local energy market.<br><br>Could you please define the equilibrium price and clarify how social welfare can be optimised? |

The reference [12], which is a previous work of the main author, has been cited as a reference for many sections of this paper. The authors are advised to add a paragraph in the introduction section to clarify the differences between this work and the previous work of the main author.

The market mechanism algorithm (Algorithm 1) should be explained within the text.

The results show that "the unitary benefit derived by prosumers correlate with a balance of quantity and price offerings in the market". The authors are advised to elaborate and have more discussion on this output.

| **Review 2** |
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| *Overall evaluation* | **2**: (accept)<br>The paper studies how to achieve equilibrium and community pool towards net-zero carbon. It is not clear what equilibrium is. Also, the scenario of high cost and excessive supply is unlikely in real-life. What is the new contribution compared to [15]? I believe this is a simple optimization problem that has been overly complicated.<br><br>The paper needs thorough proofreading to address the many grammatical issues. Check reference [15], authors missing! |