



Dynamic Remuneration of Electricity Consumers Flexibility

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Full paper: <https://doi.org/10.1016/j.egy.2022.04.056>

Summary

This paper proposes a decision support model to define electricity consumers' remuneration structures when providing consumption flexibility, optimized for different load regimes. The proposed model addresses the remuneration of consumers when participating in demand response programs, benefiting, or penalizing those who adjust their consumption when needed. The model defines dynamic remuneration values with different natures for the aggregator (e.g., flexibility aggregator or curtailment service provider) and for the consumer. The preferences and perspective of both are considered, by incorporating variables that represent the energy price, the energy production, and the flexibility of consumers. The validation is performed using real data from the Iberian market, and results enable to conclude that the proposed model adapts the remuneration values in a way that it is increased according to the consumers' elastic, while being reduced when the generation is higher. Consequently, the model boosts the active consumer participation when flexibility is required, while reaching a solution that represents an acceptable tradeoff between the aggregators and the consumers.

Highlights

- The proposed model considers the perspective's of both consumers' and aggregators, by fairly balancing the remuneration values
- The model finds groups with a common aggregator, according to their similar characteristics (clustering approach)
- The remuneration is adaptive to the consumers' flexibility, considering the market prices, the energy production and the will of these to participate in the programs



The TradeRES project will develop and test innovative electricity market designs that can meet society's needs of a (near) 100% renewable power system. The market design will be tested in a sophisticated simulation environment in which real-world characteristics such as actors' limited foresight into the future and risk aversion are included.



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Start date
1 February 2020

End date
31 January 2024

Overall budget: € 3 988 713,75



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 864276