CHULA **<u> NG</u> ACTNING**

AI-ASSISTED ENERGY BIDDING FOR RENEWABLE POWER SOURCES

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Machine Intelligence and Knowledge Discovery La Chulalongkorn Universi

THE 4D REVOLUTION

DECARBONISATION

Transformation of energy system and emergence of alternative retailers

DIGITALISATION

Technical solutionns required to service this mass scale development

DECENTRALISATION

Increasing demand for freedom of choice and birth of Local Energy Communities



DEMOCRATISATION

Entry of smaller market players, who want access to a level playing field Digitalisation

Decentralisation

Democratisation

AI-ASSISTED ENERGY BIDDING FOR RENEWABLE POWER SQURCES

Decarbonization

AIMS AND OBJECTIVES



To propose a machine learning algorithm called "deep reinforcement learning" for hourly day-ahead and intraday energy bidding in order to maximize the profit (lower the costs).



 To investigate 2 proposed models supporting both market scales: wholesale and retail energy markets. For the Nord Pool scenario, MB-A3C provides the lowest average costs per day with 15% and 34% reduction in Denmark and Sweden, respectively.





□ Average cost per day Denmark (DKK) ■ Average cost per day Sweden (EUR)

For the Ausgrid scenario, MB-A3C3 is the winner showing the most significant energy bill reduction for 15% (on 300 prosumers) compared with the energy trading directly from grids. This is because we can sell energy at higher prices and buy it at cheaper prices.



