

A Smart Contract Project: Peer-to-Peer Energy Trading with Price Forecasting in Microgrid

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Abstract : Smart contracts, which can be applied in many different areas, from financial applications to the internet of things, come to the fore with their security, low cost, and self-executing features. In this paper, it is focused on peer-to-peer (P2P) energy trading and the implementation of the smart contract on the Ethereum blockchain. It is assumed a microgrid consists of consumers and prosumers that can produce solar and wind energy. The proposed architecture is a system where the prosumer makes the purchase or sale request in the smart contract and the maximum price obtained through the distribution system operator (DSO) by forecasting. It is aimed to forecast the hourly maximum unit price of energy by using deep learning instead of a fixed pricing. In this way, it will make the system more reliable as there will be more dynamic and accurate pricing. For this purpose, Istanbul's energy generation, energy consumption and market clearing price data were used. The consistency of the available data and forecasting results is observed and discussed with graphs.

Keywords : energy trading smart contract, deep learning, microgrid, forecasting, Ethereum, peer to peer

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