

Blockchain-Based Platform for Decentralized Renewable Energy Trading: A Regional Approach for Saudi Arabia, Qatar, and the UAE

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This research presents a blockchain-based platform aimed at decentralizing renewable energy trading across three pivotal Gulf nations: Qatar, the UAE, and Saudi Arabia. In these countries where the renewable energy portfolios increasingly takes off, the requirement of flexible, transparent and efficient energy trading systems has been greatly pressed in pursuit of national sustainability targets.

Through the use of blockchain technology, the proposed platform opens the door for the secure peer-to-peer energy transaction between energy producers of any size and energy consumers. It decentralizes so that there is no dependency on central grids, improves grid efficiency, and ensures the provision of power in real time.

This study focuses on how blockchain can specifically address the energy challenges of Saudi Arabia's Vision 2030, Qatar's National Vision 2030, and the UAE's Clean Energy Strategy 2050, all based on their regulatory frameworks and energy strategies. The platform could also boost cross border energy trading and help improve grid integration in Saudi Arabia. Blockchain can help manage smart energy systems in Qatari urban microgrids, which the country is set to benefit from. An enhanced dynamic, market driven renewable energy ecosystem could strengthen the UAE's focus on clean energy transitions.

In addition to exploring regional cooperation opportunities, this study also shows how blockchain based energy trading can catalyze this greater collaboration in the Gulf. In the end, the platform provides a way for these chief drivers of renewable energy development to attain energy independence, security, and sustainability.

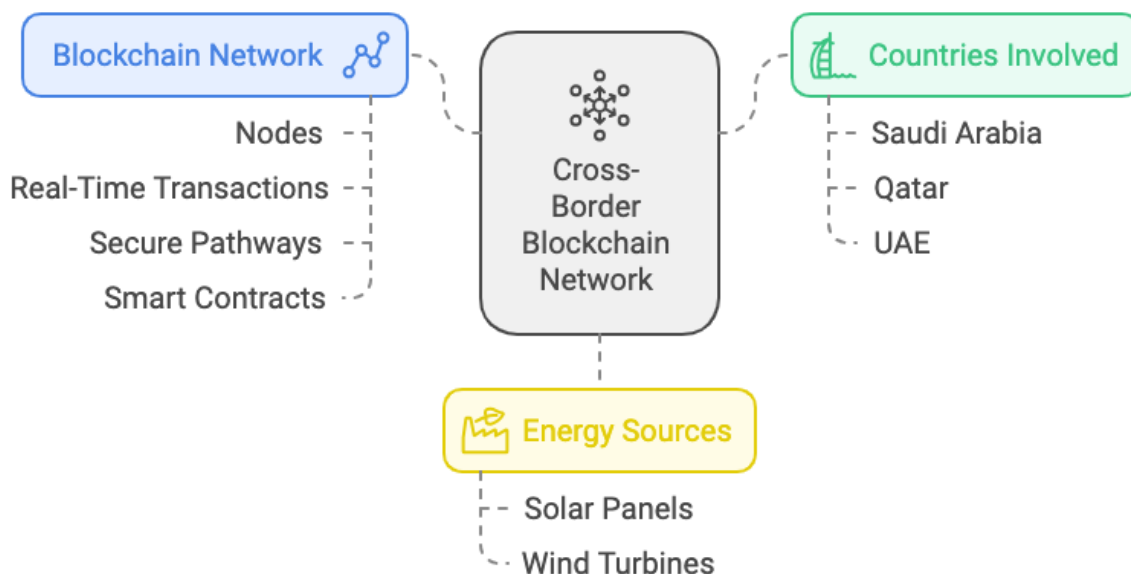


Fig 1. Blockchain network between GCC countries