



# Decrypting Blockchain

Use case in Energy Trading

**Shalin Singh, Assistant Vice-President, Kreate Energy**

If we glance around us, almost everything we see needs energy to function. The fact is that we live in a heavily energy dependent world and reliable energy is critical to our daily lives and our socio-economic system. As living standards improve around the globe and an ever growing number of consumers reap the benefits of economic advancement, the implication of this progress is that the demand for energy grows by leaps and bounds. There are a number of reasons that have made energy pivotal today. The uses of energy range from lighting to space heating, from food to metallurgical industries and from stationary uses to commercial flights.

The immense demand for energy has resulted in the development of the energy trading industry that has made rapid progress in the past years. The chief factors pertaining to this industry are demand and supply. There are numerous energy suppliers and consumers to sell or buy every type of energy product today. These “products” can be traded physically like other commodities in the market such as corn and gold. In the most comprehensible terms, energy trading is the buying, selling and moving of energy in bulk from where it is in excess to where it is needed.

Today, many places around the world suffer from the unavailability of adequate energy supply. Not all countries can produce enough energy within their nation’s boundary, which is why energy trading is vital. Logistics and defined supply chains are necessary in this day and age. The energy sector has gone from being plain vanilla to multi-flavoured, meaning there are so many players in the market that are inducing positive competition by satisfy-



ing specific customer needs.

Energy trading creates a system whereby consumers can take advantage of other users who produce more energy than they use. Those with excess energy can simply sell the excess to others for monetary gain as opposed to storing it, diminishing it, or exporting it to the power grid.

Conventionally, energy is intermediary centric. Sellers, lenders, buyers and borrowers transact through an intermediary as the transaction needs to be verified by a central reconciling authority. Traders need to draft contracts and directly communicate with one another. After necessary arrangements are made, all the required transactions involve the public macro grid.

Much like laser, another technology called “blockchain” has emerged in recent times and is disrupting the tech

world today. The scope of this technology at this moment is unfathomable. With the implementation of blockchain in the energy sector, traders will be able to place bids for energy and execute purchases through smart contracts, without the need for a central authority. Smart contracts are, intrinsically, transactions conducted only after definite conditions are met. Moreover, payments can be real-time as opposed to on credit, and reconciliation can be almost instant.

## What is Blockchain?

Blockchain is a distributed, decentralised, public ledger. The term blockchain is much easier to understand than one may think. At its most fundamental level, blockchain is literally a chain of blocks, but not in the traditional sense of the word. When we say the words “block” and “chain” in this context, we are talking about digital information (the “block”) stored in a public database (the

With the implementation of blockchain in the energy sector, traders will be able to place bids for energy and execute purchases through smart contracts, without the need for a central authority.

“chain”). These blocks store data about transactions, time, date and currency amount, using a unique digital signature, sort of like a username.

Blockchain energy trading will permit users to buy energy from specific sources. By enabling blockchain-based peer-to-peer commerce, sellers will be able to earn revenue on their excess energy and buyers will be able to procure transparently-sourced, reliable energy. The hope is that by cutting out the intermediary, prices will drop and more people will be incentivised to install different types of renewable energy generators.

Blockchain energy trading works on smart contracts. The use of smart contracts will quash the need to centrally clear transactions. Both participants of the smart contract will have pre-trade transparency. Therefore, both the transaction and the settlement will happen in real time and instantaneously. This is known as smart grid management. Furthermore, various processes can be expunged from the complex mesh of financial energy trade, thereby simplifying the settlements.

The energy sector has been a top-down business with utilities supplying power to end users. But with the proliferation of renewable energy generators, easily available at affordable prices, this grid is transforming quickly into a two-way street. This is a game changer as the end user is now putting excess power back on the lines and getting paid for it. The



future is moving towards distributed energy.

#### Advantages for energy traders

Potential solutions from the technology include:

- Tracing and tracking energy production and utilisation, thereby enabling differential pricing for renewables.
- Automated network balancing with pre-agreed smart contracts to allow zero-trust peer-to-peer energy exchange.
- Verifiable identification of customers and operational technologies to minimise non-technical losses and enable speedy settlement.
- Energy trading via the distributed ledger to remove the need for centralised settlement, which is expensive.

The ability to trade energy will substantially increase the power of consumers, as well as grid efficiency and flexibility.

#### Making blockchain a reality

While blockchain solutions are appealing for energy companies, major hurdles remain. These are:

- **Regulation:** This unavoidably follows technology invention but, in most cases, hinders the blockchain architecture.
- **Scalability:** Transactions remain cumbersome, slow and do not fit many of the high volume scenarios.
- **Security:** Even though the distributed ledger is safe, the applications that are being used remain untested and immature.
- **Standardisation:** There are numerous applications under blockchain technology. And until one of them pulls ahead clearly, investments in the technology will be held back.

Blockchain can serve as a backbone technology for energy markets based on different sellers and buyers, and peer-to-peer transactions. This new, evolving energy system, which gives consumers more choice and control over their energy utilisation and costs, can take advantage of the disruptive blockchain technology. ■

