

Blockchain applications in energy trading

“Firms are dealing with greater requirements for reporting, transparency, and dissemination of data. Costs have gone up and revenues have gone down. This technology really gets to the core of all those issues.”

Blythe Masters – CEO, Digital Asset Holdings

Picture a trade floor five years in the future. The robotic trader managing one of the gas desks is about to execute a physical natural gas trade with an industrial customer. One of the robot's trading algorithms scans available market interest and optimises its search for the best deal to meet the customer's volume and tenor requirements for a given period. Once the robot's proposed deal terms are approved by the customer, the trade is executed and recorded on the blockchain. The deal terms are automatically confirmed and nomination information is recorded on the blockchain and available to the pipeline shipping the gas. As gas flows throughout the month, physical settlement occurs daily with payment initiated immediately. All activity added to the blockchain is readily available to the seller, buyer, pipeline and bank. Physical title of the gas is also conveyed directly via the blockchain.

This example, possible using technologies available today, demonstrates one of the real powers of the blockchain. The elimination of inefficient, error prone and costly back office processes such as confirmations, actualisation of volumes and numerous forms of reconciliation. If all parties to a transaction had access to the same verified transaction record, available through a distributed database, the impact on the speed and costs of transacting would be immense. In addition, credit risk could be reduced to almost zero, through faster settlement times and lower collateral requirements. Blockchain technology has the potential to transform the entire deal life cycle minimising human intervention from trade execution to payment.

Smart contracts

Smart contracts are one application of blockchain technology that will impact all commodity market participants in the not too distant future. Smart contracts are effectively programmes which are loaded into, and sit alongside traditional transactions within a blockchain, that can automatically execute pre-definable code when called (for example, automatically executing the terms of a contract when trigger events occur). Think of a digital confirmation containing embedded IF.. THEN statements that could automatically be executed if certain price or volume conditions are met. The impact on transacting cost will be significant. The important thing about smart contracts is they reside in a decentralised system accessible to anyone, that doesn't require any intermediary party.

But blockchain technologies will not simply make the current markets more efficient. They have the potential to radically disrupt and open up the energy markets in ways people have not yet even considered. Boundaries between asset classes will blur as cash, energy products and other commodities, from industrial components to apples could all become digital assets trading inter-operably. If more value can be derived by not restricting activity to a single asset class, then that is where the market will go. Blockchain will provide the platform.

The value of the blockchain

There is good reason why the blockchain is of such high interest to so many financial market participants. The blockchain promises a transactional platform that is highly secure, low cost, fast, with lower incidents of error, and the possibility of reducing capital requirements. It essentially allows companies to automate more while processing greater volumes of data cheaper with fewer people at lower cost and risk. This is hard to ignore.

How the blockchain could help

For energy market participants, the value derived through the application of blockchain applications is compelling. Initially, it is unlikely that an entire market, commodity or deal life cycle will become blockchain enabled all at once. We will likely see pilot programmes with a select group of market participants centered on specific functional applications such as payments or smart contracts. Additional potential benefits include:

- Increases speed of exchange, which minimises transacting backlog and overall costs
- Improves availability and reliability of data
- Improves auditability as records are verified in near real-time
- Can be used to convey title of physical commodity seamlessly between market participants

What are the current bottlenecks or issues?

Transacting in energy commodities is currently inefficient. Intermediaries and complex processes impact the speed of exchanging critical data. Issues that blockchain enabled applications could address include:

- Removal or reduction of frictional costs (e.g. broker fees) that make existing transactions slower and more expensive
- Facilitates regulatory reporting requirements (i.e. EMIR, MiFID II)
- Increases efficiency by standardising data formats across multiple organisations enabling inter-operability and ensures process integrity
- Reduces risk of fraud, error and invalid transactions
- Reduces credit risk and transacting capital requirements

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Implications

There are many ways the blockchain will impact commodity market participants that we did not begin to touch on. Intermediaries such as brokers, exchanges, price reporting agencies and clearing houses entire business models could be disrupted by widespread adoption of blockchain based applications. The cost and nature of fee based transacting will be impacted. The role of regulators and ability for market participants to meet compliance obligations will need to be examined in careful detail, and in some cases regulation may ultimately evolve in alignment with new ways of working. The issue of anonymity and payments will need to be addressed, as will the ultimate link between the digital conveyance of value over the blockchain and the actual conveyance of value through an acceptable means of payment (i.e. currency).

If certain regulatory hurdles can be overcome (and this will be no small task), access to markets will open up significantly. Marketplaces will consolidate, and accessibility will explode, significantly compressing margins at the transactional level. Trading activity may increasingly involve direct transactions with members of the public, or public ‘consortiums’. Further still, the role of the trader itself may be disintermediated as end users transact (organisations and/or individuals, and again likely in groups) directly with suppliers. What is the role of an energy trader in a world where a smart home hub can connect to a global energy market and continuously balance your home’s energy use in real time by sourcing electricity or natural gas at market rates from a source supplier?

The examples above are by no means exhaustive, but they provide some hint of the potential disruptive power of widespread adoption of blockchain technologies.

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