WHITE PAPER

CAN BLOCKCHAIN DISRUPT ENERGY AND COMMODITY TRADING?

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Introduction

As Roy Amara the American Scientist once said - "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run", Blockchain is the new technology trigger that every other industry is pursuing to eliminate transactional inefficiencies. Energy and Commodity trading sector is looking at using blockchain to reduce operational risks and costs, bring in efficiencies in back office processes by eliminating intermediaries.

Major Energy producers, consumers, trading firms and Banks such as BP, Shell, Statoil, Mercuria, Koch, ING are running pilots to develop Blockchain based trading solutions. Consortiums like the Energy Web foundation, Enerchain has been formed to accelerate adoption of Blockchain technology in energy trading. This paper aims to analyze the impact Blockchain technology has on the Commodity and Energy Trading landscape and look at possible use cases in this space.

Current Inefficiencies in Energy and Commodity Trading

Energy and commodity trading involves cumbersome processes and multiple intermediaries at various points of the lifecycle which makes it inefficient, error prone and expensive. Multiple applications are used for processes such as Confirmations, Reconciliation, Trade Finance, Settlement, Operations and Delivery especially for Physical and OTC trading which slows down the exchange of information between parties. Transaction costs and collateral requirements are quite high in the industry due to counterparty risk involved. Below is the list of indicative inefficiencies in the energy and commodities trading space.

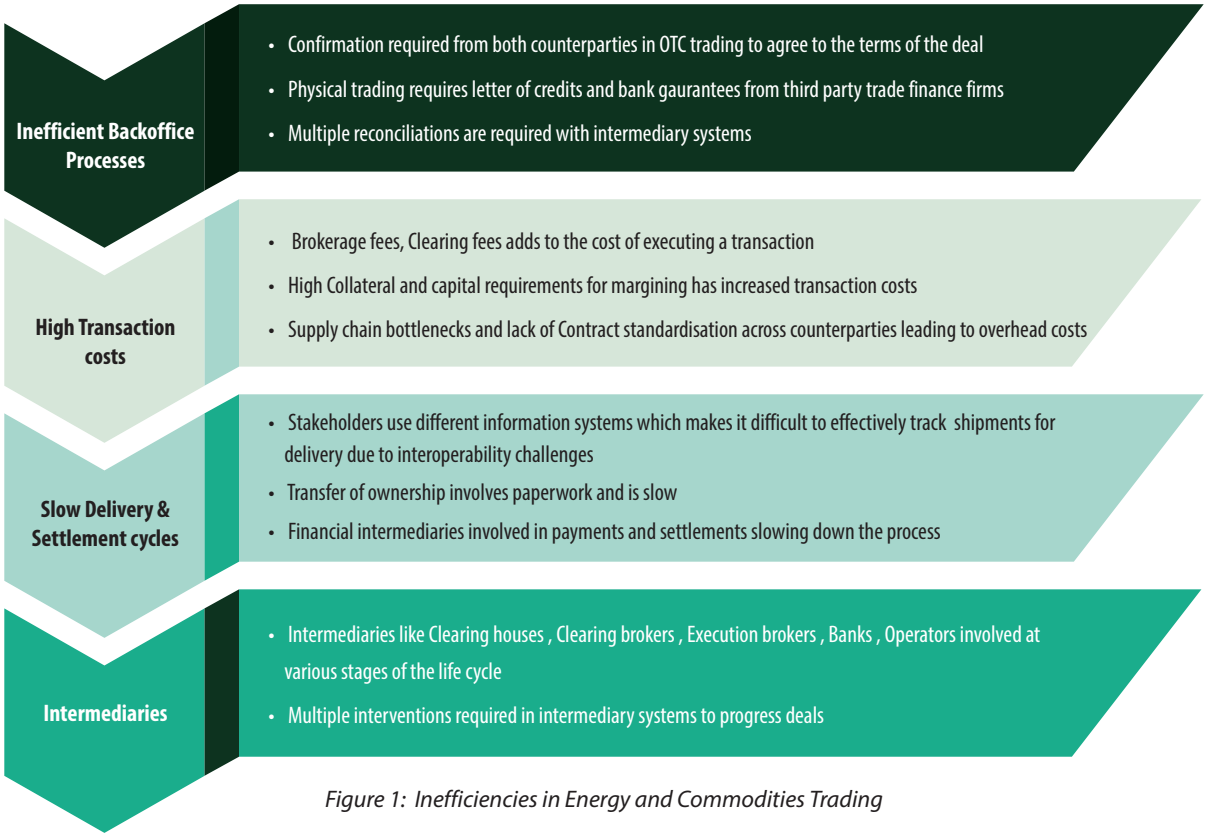

Figure 1: Inefficiencies in Energy and Commodities Trading

How Blockchain can help?

- If all the stakeholders to an OTC transaction are available in the same interoperable network and have access to the same verified transaction at real time, this eliminates the need for intermediaries and processes currently required to execute various deal lifecycle events.

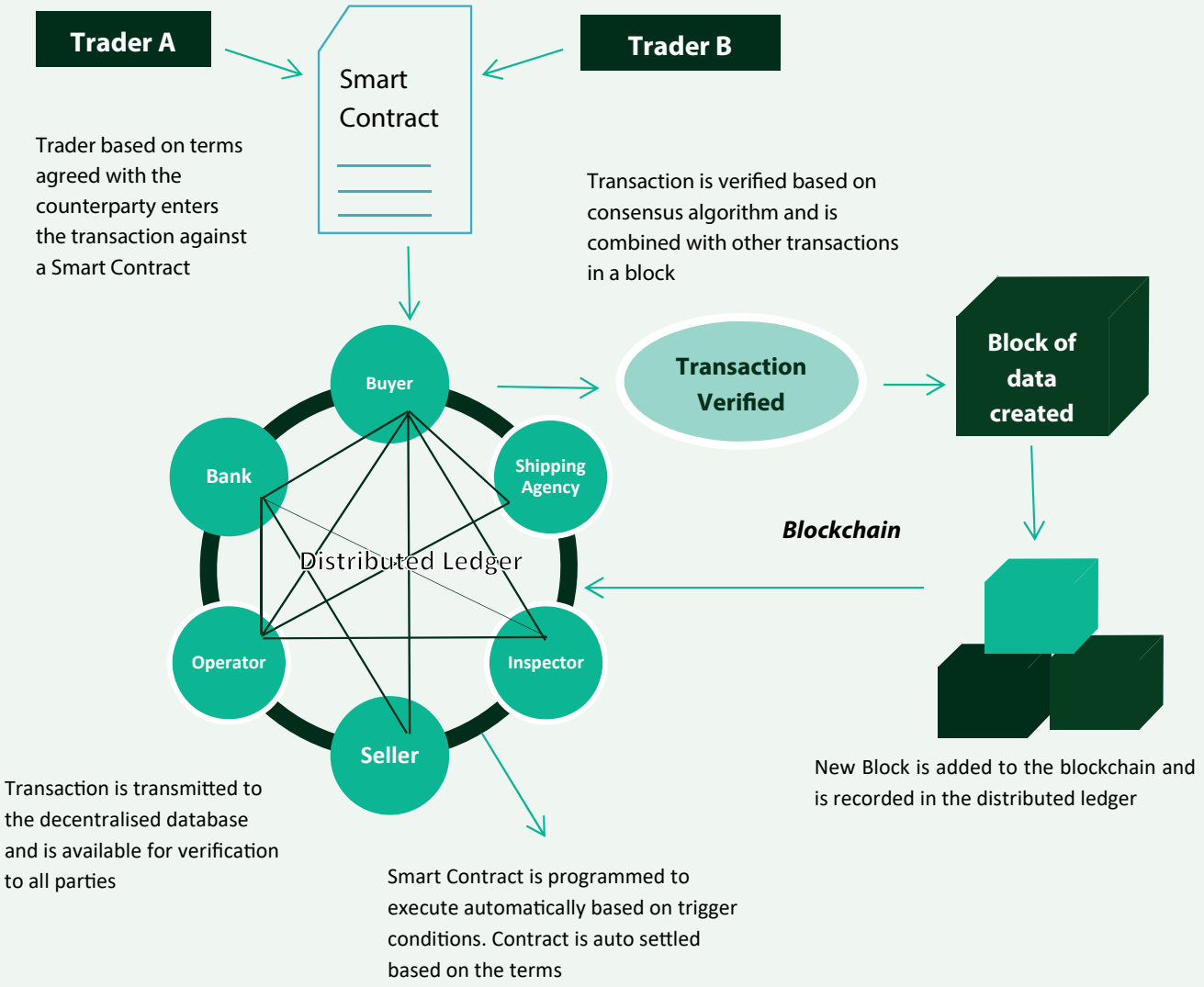

Figure 2: High Level Blockchain based trading workflow

- Faster exchange of information enabled by the distributed ledger technology can reduce the settlement timescale significantly leading to faster movement of commodities reducing counterparty risk.
- Reduction in settlement cycle will lead to low capital and margin requirements in order for the counterparties to enter into a deal thereby increasing the market liquidity.
- Improved trade finance availability as Banks are on boarded on to the same distributed ecosystem which enables banks to verify the firm's credit worthiness. Digitisation of commodity assets will enable the recipients to transfer assets as collateral against payment.
- Traceability of commodities across the supply chain can be improved.
- Intermediary costs such as Broker, Clearing and Settlement fees will no longer be applicable bringing down the cost per transaction
- Digitisation of commodity assets will enable the recipients to transfer assets as collateral against recipients

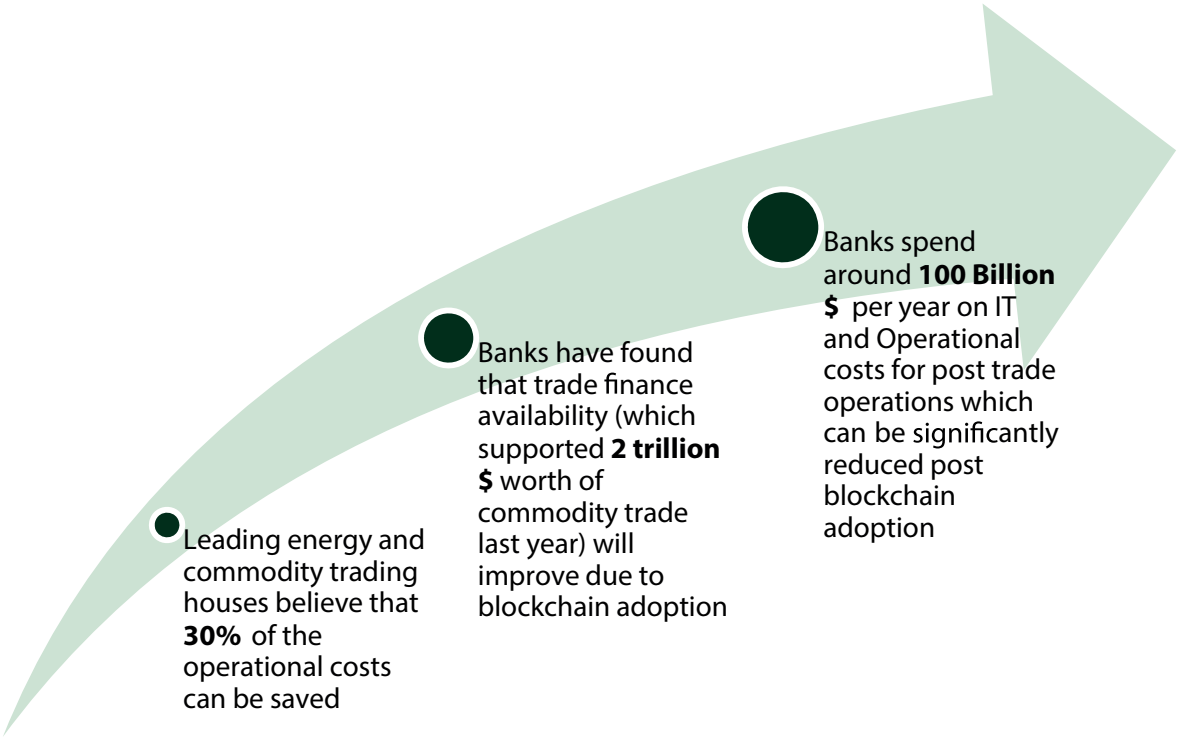

Figure 3: Key Benefits

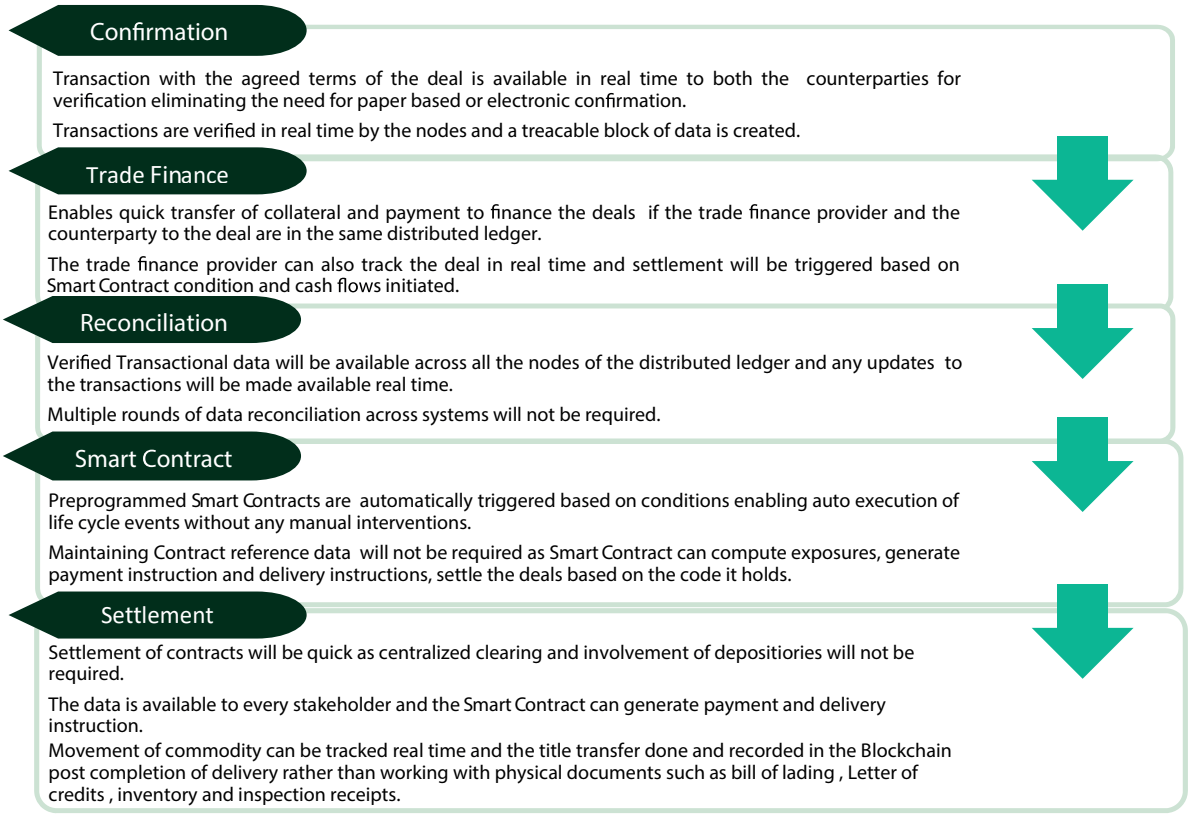

Figure 4: Key Industry Use Cases

Key Industry Initiatives

Market participants and key industry leaders are running pilots and forming consortiums to trial and accelerate the adoption of Blockchain in energy and commodity trading. Some of the key initiatives are listed below –

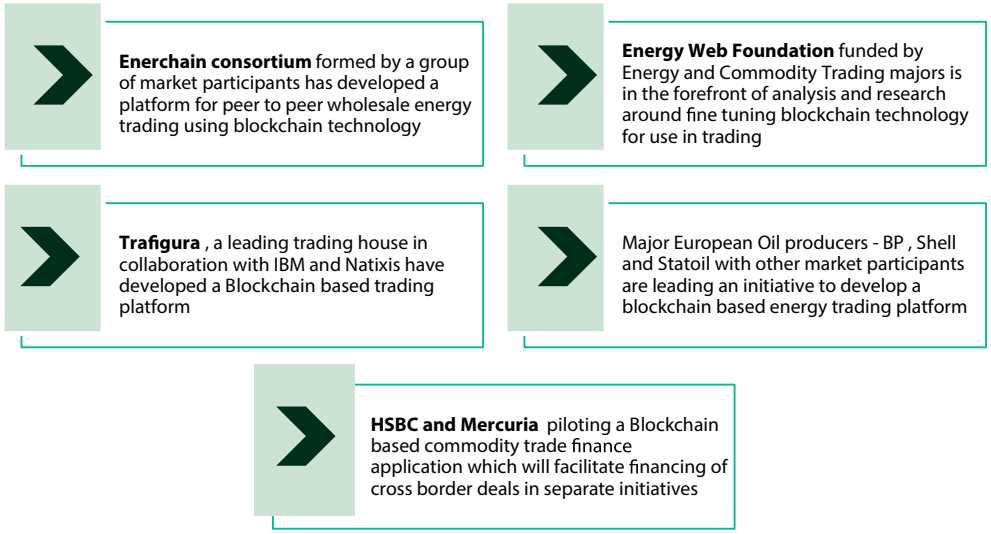

Figure 5: Key Initiatives

Challenges in Adoption of Blockchain

Blockchain technology is yet to be rolled out at an industrial scale which will require addressing some of the technical, legal and regulatory challenges before its adoption picks further pace.

- ***Scalability*** of the technology is a concern. Bitcoin platform powered by a public Blockchain can process just a few transactions per second. Fintech firms are trying to solve the scalability issue which is critical for trading firms to adopt the technology
- ***Performance*** is hindered due to the complexity of the consensus algorithm required for verification of the peer to peer transactions. Alternate algorithms such as Proof of Stake are being developed to fasten the verification and increase throughput.
- ***Anonymity*** of the transactional data is a concern as all the market participants in the distributed network will hold a localized copy of the data. Cryptography is yet to evolve to selectively reveal data to some of the nodes. Private permissioned distributed ledger technology administered by a central operator with customized set of rules which is currently evolving should address some of these issues
- ***Legal framework*** customized for this technology and a distributed system needs to be formulated as the market participants involve in peer to peer trading without a central authority.
- ***Regulatory and Compliance*** requirements around trading, mandatory clearing and reporting has to evolve based on the technology advancement. In its current form, market participants using Blockchain will not be able to comply with the regulation

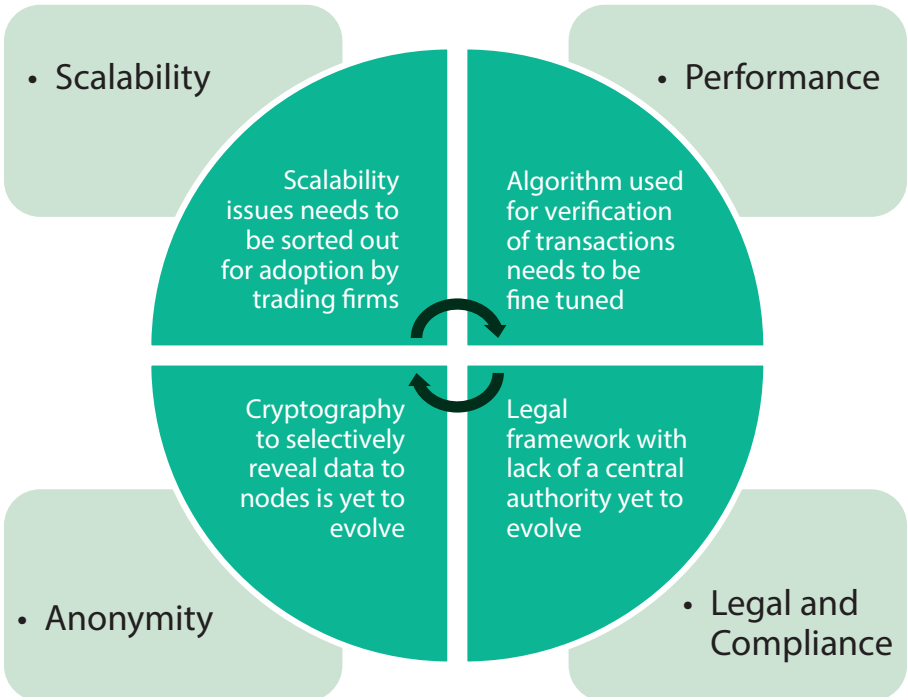

Figure 6: Challenges in Blockchain adoption

Conclusion

Market participants are not expected to adopt the technology across their transaction pipe. Blockchain based pilots will be run on specific functionalities such as Confirmation, Smart Contracts, Trade finance , Settlement to verify feasibility and potential savings. In the short term, firms will look to streamline operational processes using Blockchain and in the long term the Blockchain technology is expected to disrupt entire market structure removing Clearing, Settlement and Financial intermediaries making it a peer to peer trading network.

Market participants are relying on Fintech firms and consortiums formed by major industry players to solve various technical limitations for an industry scale roll out of Blockchain based applications. Overcoming legal and regulatory hurdles and technical advancements enabled by fintech firms and consortiums are key to the rate at which firms adopt blockchain technology.

About the author

Prasanna Sekar - Senior Consultant, FSDCG- Capital Markets Practice

Prasanna Sekar has over 11 years of experience in IT and Domain Consulting with expertise in Energy Trading, Derivatives Clearing and Settlement, Regulatory Reporting and Treasury Management. Prasanna has worked with major European clients in Energy Trading , Regulatory reporting and Clearing implementation projects and has developed solution accelerators in the area of Regulatory reporting. He holds a Bachelor of Engineering degree. He can be reached at prasanna.sekar01@infosys.com and over Linkedin at https://in.linkedin.com/in/prasanna-sekar-03045099

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