

Business model innovation of Blockchain-based energy trading platforms – work in progress

ESMT BERLIN

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Key observations and research questions – beyond the Blockchain hype

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Observations

- Underlying business models of Blockchainbased energy trading and clearing platforms are **not yet clearly defined**
- Reality diverges from the founders' vision of implementing energy-related Blockchain applications – very few live sites
- More pragmatic perspective on the actual capabilities and weaknesses of the technology
- Two types of platforms emerging:
 - Consortia such as VAKT or the Energy Web Foundation, which include startups, utilities and multinationals, banks, sometimes even NGOs
 - Individual companies pursue and provide integrated solutions for specific markets (Blockchain-as-a-service)

Research questions

- In which fields do executives see the greatest potential and hurdles for implementing Blockchain solutions in the energy sector?
 - ⇒Quantitative global survey among professionals in jobs related to the energy sector
- How do business models in energy applications and platforms differ between single providers and consortia?
 - ⇒Qualitative interviews with providers from the energy sector, and non-energy firms, in particular finance/ fintech

Research output (beyond IAEE)

 Integrated in a research project called ETIBLOGG (Energy Trading vla Blockchain-Technology in the LOcal Green Grid), funded by the German Federal Ministry of Economic Affairs and Energy





Quantitative analysis: Follow-up of joint dena/ESMT study in 2016

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Blockchain in the energy transition. A survey among decision-makers in the German energy industry, with A. Kuhlmann and P. Richard. Dena/ESMT publications (2016)





In 2019, less than 25 percent of respondents have implemented Blockchain in their businesses work in progress

HAS YOUR COMPANY OR ORGANIZATION ALREADY TAKEN STEPS TO IMPLEMENT BLOCKCHAIN-BASED SOLUTIONS?



YES, WE HAVE ALREADY IMPLEMENTED A BLOCKCHAIN-BASED SOLUTION. YES, WE HAVE A PLAN FOR IMPLEMENTATION.

NO, WE HAVE NOTHING PLANNED OR IMPLEMENTED YET.

Source: Own survey (2019), n=72 respondents



The potential of Blockchain is evenly distributed between platforms/ marketplaces and process optimization – with further dissemination expected work in progress





Yet, compared to 2016, a higher number of respondents consider Blockchain a game changer, but skepticism in Australia and the USA *work in progress*

HOW HIGH DO YOU ESTIMATE THE POTENTIAL OF BLOCKCHAIN IN THE ENERGY SECTOR?





Regulation, market acceptance and efficiency/ maturity are perceived as the greatest hurdles for Blockchain in the energy sector *work in progress*





Qualitative interviews with key decision-makers in energy-related, financial and multi-sector Blockchain applications to shed light on the business models pursued *work in progress*





Value propositions range from Blockchain-as-a-Service for individual companies up to platform provision work in progress

Platforms

"The solutions are categorized in three dimensions. The first dimension is **join**. The second is **coordinate**, and the third is **build**: software as a service, like subscription, you have cloud services, and you have consulting application services." "We **develop software** for the decentralized network (platform), facilitate meetings, and produce or develop customized software for some of our affiliates, like IT services, or license payments. It's very similar to **Linux Red Hat business model**, on the one side Linux made an open source software, on the other side Red Hat made money with services. So you can consider our organization as a mixture between Linux and Red Hat in one."

"BaaS: Our value proposition is to speed up the development so that companies do not need to take care of application management services or running Blockchain."

"Integration of Blockchain data: Merging data of internal processes with Blockchain data, eg. to send an invoice." "[We] act as a doorman, or an identity operator"

"That is just a **communication channel**. You can compare that with a chat service for example, with the Yahoo Messenger – before it was decommissioned, is been used as a **tool to offer and accept offers between traders**."

Apps

Single providers

Setup of organization

Consortia



Blockchain is used as communication channel, as transparent access to critical data for all market participants and to reduce organizational cost *work in progress*

Platforms

"It's not just 20% technical optimization, it is **90% cost reduction**, because this organizational cost disappears. Instead, the nodes need to be hosted in the cloud, which compared to 5 million - is maybe in the range of 5-10,000 Euro." "In my view, first are the typical value propositions that are addressed and delivered by Blockchain technology; first transparency, second trust; third, speed or acceleration concerning processes; and fourth, a wallet, the security dimension. Therefore trust, security, speed, acceleration."

> "You would model Blockchains in a way that utilities are able to **pass it to their own internal processors**, and then you merge the data with Blockchain data to get a real customer, to maybe send an invoice."

"Our affiliates tend to **use the Blockchain as little as possible**, because it costs money to use the Blockchain. So, usually it's being used for coordination purposes, for access rights, for value transactions, for a recording of provenance, and so forth. But as little as possible. Generally, **coordination of rights or of ownership of assets**."

Apps

Single providers

Setup of organization

Consortia

Source: Own survey (2019)



Major hurdles in energy-related Blockchain applications range from technology, market acceptance, regulation, calculation, privacy up to integration of tokenization to ECR system

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⁻latforms

" One is a **technical pain point** ...If it is a high frequent market, Blockchain won't work for the execution because **we always** have a delay."

Focus of solution

execution because we always have a delay." ... "And the second pain point has absolutely nothing to do with the technology. ...there have been brokers who attempted to establish a new platform and they all failed in dragging liquidity from the existing platforms.." ...

"If you have this multilateral trading facility (MTF), which simply said is like an exchange, you have a bunch of **regulatory requirements to fulfill** and that is a very complex situation." "We use Hyperledger Fabric, only because we truly believe that it is the only really enterprise-ready technology, it's really important to have technology that is **capable to run these high performance numbers**."

"A challenge is **high volume calculation**, which Blockchain is not made for. Blockchain is for some ethical events but not for disaggregation or analytical processing based on an energy data management data." "We have a bigger problem on the **privacy issue**. Whereas we developed a couple of features around privacy, but of course, it's easier in a private chain."

"Pretty much all over the world you need a physical piece of paper to accompany a good. So that is where regulation is behind, but it's also **not necessarily a Blockchain** problem."

Apps

Single providers

Setup of organization

Consortia



Financing models mirror classical IT-pricing up to tokenization

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Platforms

"Instead of having this foundation approach, we first start this as a service. Market participants will **pay a fee of €500 per month**, including 500 transactions per month. If it goes beyond 500 transactions per month, it will be charged on the basis of additional transactions." "It's a heterogeneous approach with services offerings coming out of different areas within our company, like consulting, architectural services, software as a service cloud, and so on, as the solutions are very different."

"The challenge is to **book tokens in the financial systems** and up-date from the financial regulation to the latest market price of the token."

"We expect in the future that utilities don't want to hold tokens. This is not a business model. This is something that banks can do better." "We charge through a **licensing fee** for the enterprise version, but the platform is **open source** and free for anyone to use. The way we charge is through enterprise licenses."

"Besides fundraising, cash flow. It will be combination of cash flow based business models, which is as I said before, the **Red Hat business model** and a mixture of **token economics**."

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Single providers

Setup of organization

Consortia



Key insights of quantitative and qualitative field research

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Potential and timing

• Blockchain apps and platforms to become commercially deployed in 1-4 years in the energy sector ⇒Pilot projects and first applications already on the market

Business models

- Business model convergence between platforms and apps
 - ⇒Platform providers offer app services (Red Hat/ Linux model)
 - ⇒Blockchain-as-a-Service providers create platforms with key stakeholders and clients

Potentials and hurdles

- Potential of Blockchain is evenly distributed between platforms/ marketplaces and process optimization
- Regulation, market acceptance and efficiency/ maturity are perceived as the greatest hurdles
- Blockchain-as-a-Service solution from single over consortia to platform applications most advanced with no regulatory and market hurdles seen
- Blockchain platforms with tokenization with many regulatory and market hurdles

Comparison with other industries

• Finance sector more advanced than energy in terms of implementation

⇒May be related to the physical/ technical/ regulatory context of energy as a public infrastructure service



Upcoming book to analyze governance and business models on a global scale

Decentralised Energy a Global Game Changer

Christoph Burger + Antony Froggatt Catherine Mitchell + Jens Weinmann

Contents

- 1. Introduction: The rise of decentralized renewable energy generation
- Regulatory and policy incentives establishing governance of decentralized energy systems
 Country analysis: Australia, China, Denmark, Germany, India, Italy, California and New York Decentralised Energy: a Global Game Changer, Ubiquity Press (forthcoming)
- Business models beyond subsidies which core competencies are needed?
 Case analysis: Envio Systems, Timo Leukefeld, Entelios, SOLshare, Mobisol, Solarkiosk, Power Ledger
- 4. The three phases of the energy transformation top-down and bottom-up
- 5. Global game changer leading the future

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