BTO WORKSHOP ON OPEN MARKETPLACES TO SPUR INNOVATIVE ENERGY SERVICES

22 October 2018, ENTSO-E Offices

The workshop has been jointly organised between DG CONNECT and DG ENER in cooperation with the alliance AIOTI (aioti.eu). It was hosted by ENTSO-E – the association of EU electricity transmission operators in Brussels. It gathered around 70 participants, the majority of industry and related associations. This workshop built on the previous workshop on this theme of 21 March 2018, and it was also the occasion to successfully relaunch the Working Group of the alliance AIOTI on IOT and Energy (WG12).

In the energy sector, digitisation helps to tap into the flexibility potential offered by demand response to help to keep the grid stable by balancing electricity production from variable sources like wind and solar. Digitalisation does not only support flexibility, but also new business and finance models in itself to provide more solar and wind (the Solarcoin is a point in case). At the micro level, connecting objects through the Internet of Things (IoT) makes every electric device a contributor to the energy system by bundling distributed energy resources into larger ecosystems. The workshop tackled opportunities for blockchain as a facilitator of the energy transition, from smart energy services based on IoT for connected appliances, smart mobility, to P2P energy trading and smart utilities.

The workshop had four parts:

1. Digital Technology Enablers

2. Market Trends and Showcases

3. Grid Innovation

4. Community-driven investments and innovations

The main messages are summarised as follows:

- **Platforms & Markets: there will not be one market platform so the development of an open architecture for IoT/blockchain service solutions is necessary.** In the opening of the workshop, Laurent Schmitt as Secretary General of ENTSO-E called for open, vibrant marketplaces that scale across Europe. He also said that the Smart Grid Architecture Model is the bible to exchange information for network operators, but it does not describe the exchange of information with the 'grid-edge'. There cannot be one marketplace, so the European energy sector should allow several marketplaces to flourish but avoid fragmentation, that are interoperable so that markets/actors can send each other incentives and respond in real-time. Bringing a multitude of IoT connected objects' flexibility to the grid requires new ways of working. Digital trusted contracts could replace current paper contracts, for example, to digitalise permissions to use an asset, and identify the flexibility service that the asset can provide: this would make access to the flexibility market much easier (Actility). The chair of AIOTI, Kees van der Klauw, called for open architectures and open standards as a means for a bold innovation strategy. Natalie Samovich, the chair of the working group on Smart Energy at AIOTI emphasised IoT as a significant cross-sector technology enabling smart grids – which is at

the core of evolving multisided energy marketplaces. Companies, especially from the energy sector, cannot do alone to master the transformation of the energy grid and bring new services to consumers: energy is an enabler but also a domain in itself, and he asked if energy can take the lead in applying IoT and blockchain. The special role of start-ups and SMEs in the IoT ecosystem has been emphasised during the day.

- **Hackathons provide an innovative approach** to develop use cases. Europe is leading on investments in DLT/blockchain technologies with centres in Berlin and Paris, and most of the business is driven by small companies and start-ups. The KIC InnoEnergy support to start-ups helps to drive entrepreneurship and test new technologies, especially hackathons are essential to reach out to innovators and developer communities.

- **Blockchain needs orchestration with IoT and AI**. However, blockchain technologies are at a very early stage of development lacking proof of maturity and scale. Successful deployments and future developments necessitate, DLT/blockchains need to be developed, tested and applied in combination with IoT and AI. SME's and start-ups are developing and testing the blockchain/DLT technologies, but the big companies' involvement is necessary, in particular, their willingness to share data and ensure interoperability: ownership or access to data is not enough: brokers are needed to extract value from the data;

- **From the proof of concept to the next step – proof of business: what is needed?** The energy sector calls for innovation through DLT/Blockchain technology. It has been commonly agreed that blockchains are instrumental for P2P marketplaces and dynamic energy trading for future market design. Start-ups bring grass-roots innovation. 4 start/ups (BovLabs, IOTA, Enervalis, SolarCoin) were present which confirmed that most of the innovation still is at a proof of concept stage. None of big equity (>10 million Euro) blockchain marketplaces investments are in the energy sector, so what is needed to make this happen?

- **Different types of blockchain and DLT solutions are being applied in the energy sector**: public and private, open and closed. TenneT trials with DLT developed by IBM, Energinet and Elering use DLT to set-up a cross-border data hub using Sovrin, whereas ELIA and Centrica test the blockchain solution of the Energy Web Foundation. Besides, IOTA developed a public blockchain without fees that makes fee-less micro-transactions possible: they question the need for a contract when each transaction is minimal. This technology can, therefore, disrupt the existing business models based on contracts.

- **Avoid mushrooming of blockchains?** The majority of business models for small companies rely on partnering with corporates (e.g. transmission operators, mobility operators like SNCF, DSOs, Electric vehicle e charging) to test, validate and smart services and trading solutions based on individual blockchain implementations, which by itself serve individual needs and are not necessarily developed with a scale-up in mind. Interoperability of DLT/blockchain solutions is critical, which requires related standards that need to be discussed.

- **The drivers for blockchains in the energy sector are grid services and peer-2-peer trading.** The main drivers behind investments in blockchain are:
  - cost savings (for grid operators to cope with the increasing number of de-centralised assets. Energinet, for example, asked the question if the 96 million Euro market for ancillary services can be opened for IoT devices. Eaton mentioned the e-mobility as a key driver, and Enervalis considers that dynamic pricing alone is not a sufficient element for business-case for flexibility services, i.e. grid flexibility needs to be included);

- o enhanced traceability (guarantee of origin of generation from RES has been highlighted several times, but also the identification of an object and the service it can provide through a digital trusted contract);
- o increased transparency and trust (Communities could be a driver for new applications and services, projects mentioned were o.a. Brixton Energy, Buurzame stroom in Gent, StromDAO, GroenLeven);
- **b2b, b2c, b2public sectors:** The creation of novel business models beyond B2B and engaging with different communities is of utmost importance for fast adoption and up-scaling of innovative energy solutions. In the future, it won't be one operator bringing innovation to the market but the value creation will be shared between multiple stakeholders ranging from supermarkets, building and facility managers, municipalities, aggregators, car manufacturers, related utilities**.**
- **Grid operators: why blockchain and not another cloud technology?** Several of grid operators identified blockchains as a means to reduce transaction costs. A distributed ledger is instrumental to identify and manage an increasing number of assets (consumer, storing, producing energy). It seems that the preferred partners are large companies like Fujitsu, IBM, SAP etc. where blockchain is supported with flexible economic models, e.g. XaaS. To scale-up these developments and include more stakeholders, a smooth transition infrastructure is needed to move seamlessly from cloud to blockchain solutions. Also, ENTSOe stated that blockchain is not yet an option for power system operations and real-time applications due to the latency and response time, but it enables unleashing the potential of flexibility. Others consider blockchain is suitable to apply (near) real-time in (micro-)local energy markets (EEX, eDream);
- **Digital economy: competitiveness** Participants mentioned innovation projects on flexible grid management in the U.S. (Brooklyn microgrid, or California startup LEAP in California's Distributed Energy Auction) by which American players like Tesla, Uber explore disruptive grid innovation. European industry may experience fierce competition from non-European digital platform providers if Europe does not accelerate the adoption of innovative (digital) solutions in the energy sector. On the other hand, the European Parliament's resolution of 3 October 2018 on DLT and blockchain was considered a very important and positive statement.[1]
- **Platform Governance is key for Data Security and Trust**: Solutions for the future: much more data, many more actors – more transparency/trust. Concerns were raised, especially by (the Danish and Estonian) grid operators, on how to implement open data and shared data space.
- **Allowing for experiments in deregulated sandboxes is needed:** Developing and testing innovative marketplaces in deregulated 'spaces' is a pre-condition to realise the potential of open marketplaces. Participants called, for example, for a 'sandbox' regulatory model beyond piloting / proof of concept to explore services and scaling of new business models. The regulatory framework needs to allow different markets/platforms to co-exist (Atos). The merging of sectors, business models and b2b and b2c also requires that the rules for (energy) supply licenses must be revisited (Centrica).
- **'Energy for Citizens'**: blockchain applications require consumer trust and consent. GDPR was not considered a show-stopper but compliance with the GDPR is very important. It addressed community-driven innovation models which have been explained through shared energy models

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[1] European Parliament resolution of 3 October 2018 on distributed ledger technologies and blockchains: building trust with disintermediation: http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P8-TA-2018-

for socially disadvantaged consumers, distributed energy for electric mobility, construction, buildings and smart cities. Consumers are at the centre of the 'CleanEnergy package', but in terms of digital enablers the concepts and pilots so far lack a systemic approach across sectorial players and legacy systems, i.e. interoperability and standards needed to enable energy optimisation across different sectors. Cross-fertilization, however, is of paramount importance for spurring open marketplaces for new services and investments in renewables.

- Digitalisation is also opening up new business models for energy production and use.
- **Next actions**: A follow up workshop in Q1 2019 – after the selection of the pilot on Interoperable Homes and Grids – is planned, based on a paper that will analyse and gather views of stakeholders on the key topics that were raised at the workshop, namely:
  a. Regulatory questions:
     i. GDPR? Security?
     ii. What are the issues that require sandboxing? BRP. Roles in the electricity market.
  b. Scale-up through projects & commercially
     i. Interoperability of platforms
     ii. Blockchain speed of data handling
     iii. Quick steps/actions in the next 2 years?
  c. Competitiveness:
     i. Platform governance;
     ii. Involve SME's;
  d. What's not covered? What are the issues that are coming?

These topics are to be discussed and confirmed in the follow-up work that will be open for inputs from all stakeholders.

Annex – overview of series of workshops on digitalisation and energy

In summary confirming and reinforcing previous findings of the first seminar organised by the European Commission and blockchain and energy, on 21 March 2018 that presented a broad overview of possible and practical (test) applications of blockchain in energy. It is part of a series of workshops under the focus area Digitising and Transforming European Industry[2]:

- High-Level Meeting Interoperability to create the Internet of Energy, 11 May 2017 in Brussels

- Seminar IOT AND BLOCKCHAIN TECHNOLOGIES FOR HOME AND ENERGY SERVICES, on 21 March 2018 in Brussels

- Workshop on Platform Convergence for Smart Home Services for Health and Energy, on 13 April 2018 in Brussels

- Workshop on Digital Business-to-business platforms for smart factories and energy, Open Workshop on 15-16 Oct. 2018 in Brussels

- Data Marketplaces Workshop: Big IoT Workshop by Siemens/Bosch on 06 Nov 2018 in Berlin

OPEN MARKETPLACES TO SPUR INNOVATIVE ENERGY SERVICES

22TH OCTOBER 2018

ENTSO-E Offices, Avenue de Cortenbergh 100 1000 Brussels

28 speakers

Topics of the workshop:

- Technology Enablers for open energy marketplaces
- Community-driven Application and Services
- Blockchains adding flexibility to Grids

#digitalmarketplaces #energycommunity #DLT
#blockchain #P2Penergy #energytransformation
#digitalisation #energyservices #interoperability

European Commission

AIOTI

Open Marketplaces to spur innovative Energy Services
jointly organised between DG ENER and DG CONNECT and the Alliance AIOTI

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[2] Focus Area Digitisation: 500 Mill € are going to be co-invested between DG ENER, AGRI, RTD and CONNECT (/A2, E4, G1, H3, H5, D3) on platforms and pilots in sectors like farming, energy, manufacturing and health