Digitalization of utilities

Conference presentation

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pwc

Several key trends are reshaping the energy world and opening the way for new business models

Decarbonization

The **Paris Climate Agreement** limit the global temperature rise to **2 degrees Celsius**

32%
RE share

A clear plan is needed to achieve sustainability goals.

Decentralization

From a centralized energy system to **distributed generation and energy storage.**

25
Mio.
E-cars

The growing decentralization strains grids.

Digitization

From the IoT metering device to the energy-saving app: **digitalization is changing consumer behavior**.

7 Mio.
Smart devices

Smart devices cope with complex energy systems.

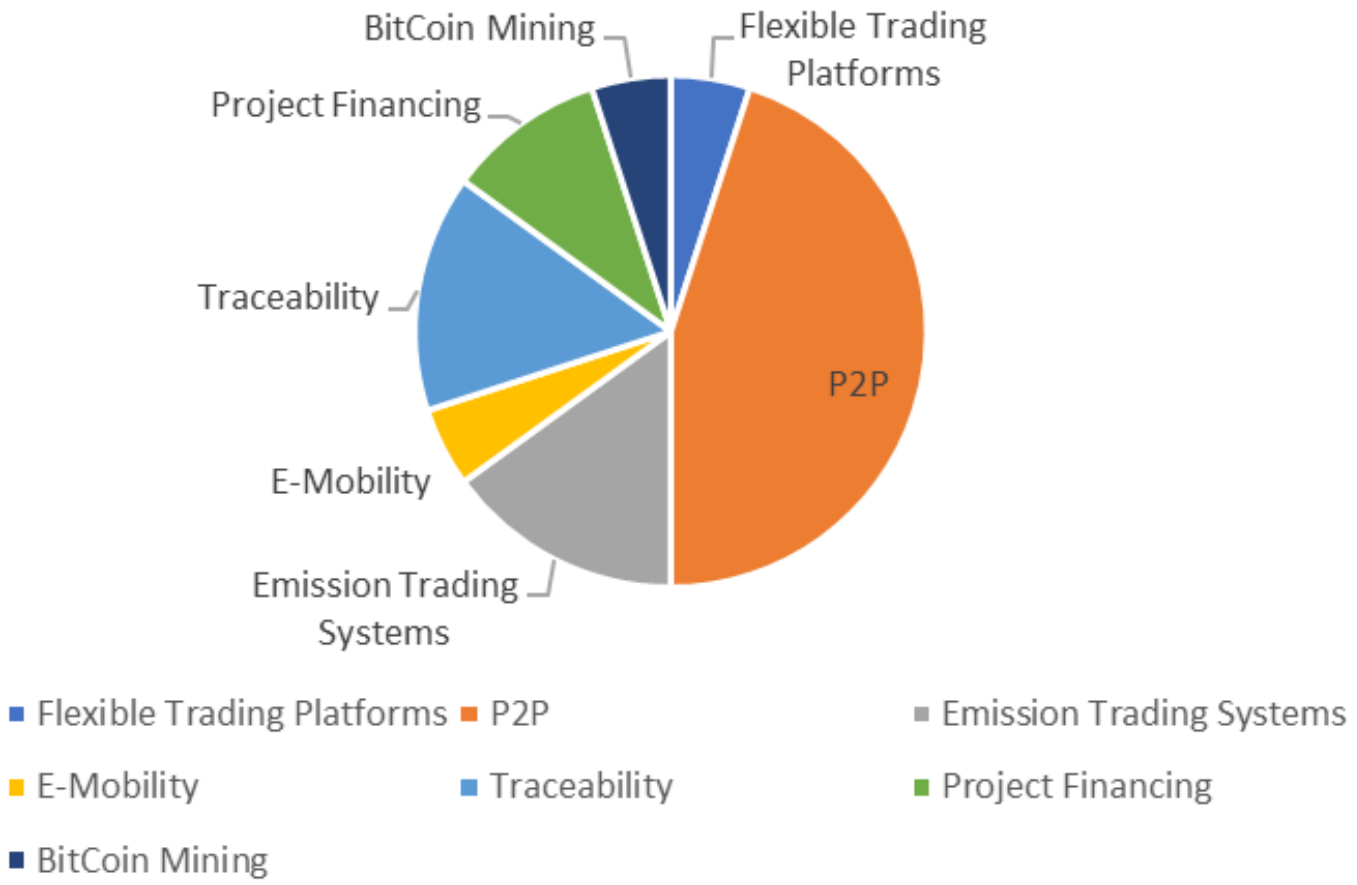
Democratization

Vehicle-to-grid, electric cars, home batteries, smart meters, solar PV panels bring to **the prosumer era.**

10,7
Mio.
Private RE assets

Enabling people to trade electricity locally.

Key insights - 7 Types of Blockchain-enabled Use Cases

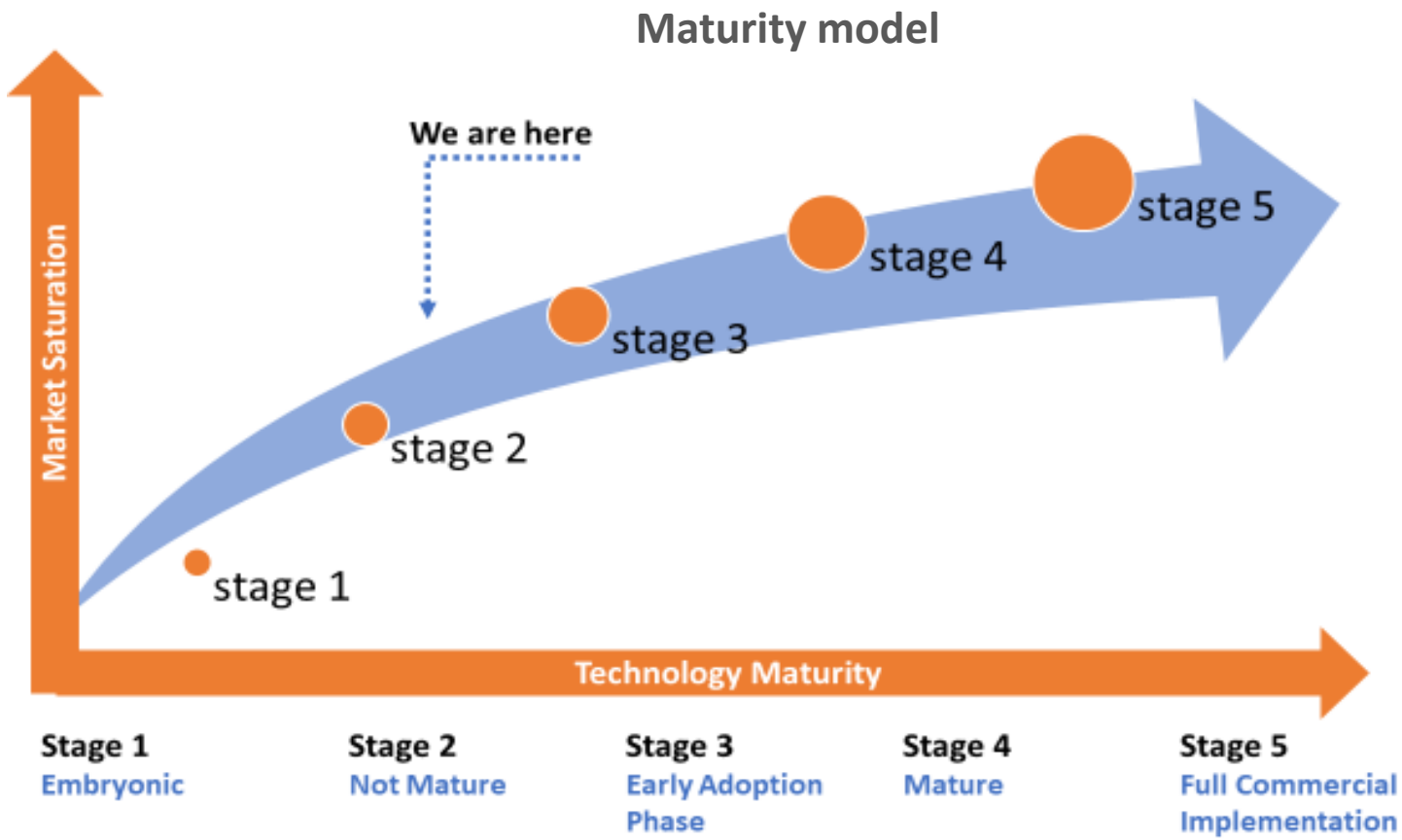


- Although **P2P** is one of the **most regulated** use case, numerous incumbents and startups work on related business models

- **Emission trading systems including CO2 and green energy certificate** is one of the most relevant application

Key insights - How Mature are Blockchain Enabled Use Cases

Blockchain Technology in the energy sector continues to be in its infancy



- Blockchain has to overcome network **efficiency challenges**
- **Regulatory boundaries** slow down innovation and thus Blockchain-based business models
- Blockchain use cases have to **solve business and customer needs**

For a German utility company we developed a business model and a prototype for a regional P2P energy trading platform

Prosumers – owner of renewable energy asset

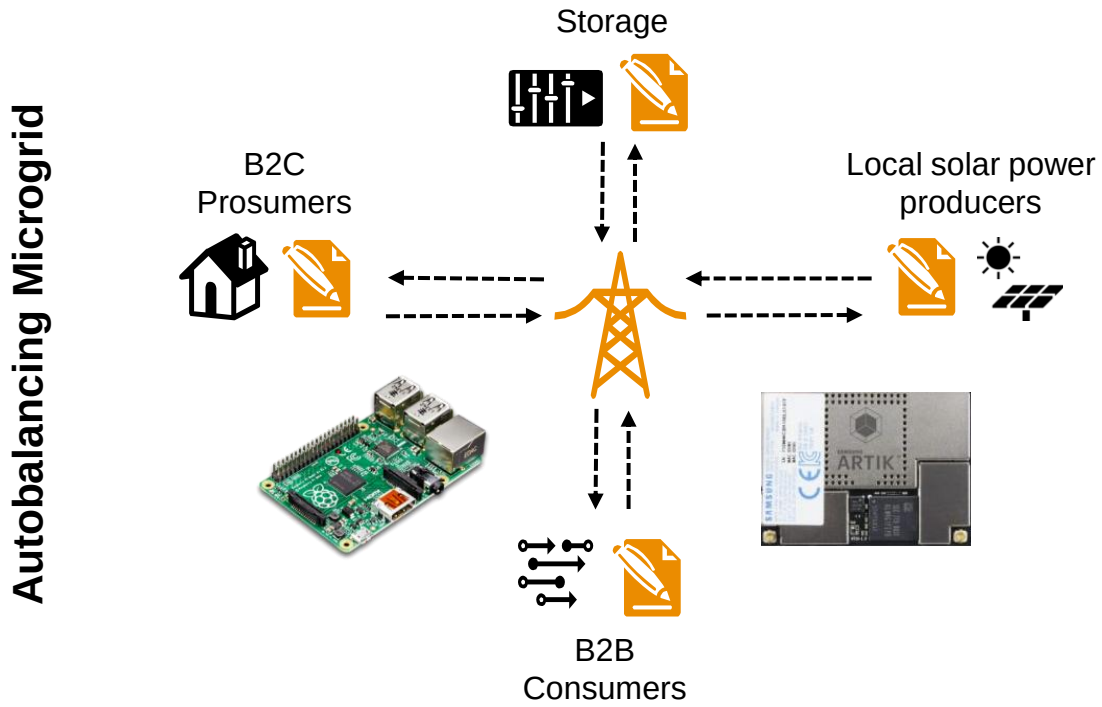
Regional utility and platform operator

Consumers – environmentally conscious customers

- The utility company offers and operates a **Blockchain-based "marketplace"** for owners of renewable energy systems and for regionally-oriented consumers
- The utility company **allows settlement by supply (kWh fed) and demand (kWh consumed**)

For a German utility company, we developed a self-balancing microgrid based on Blockchain technology

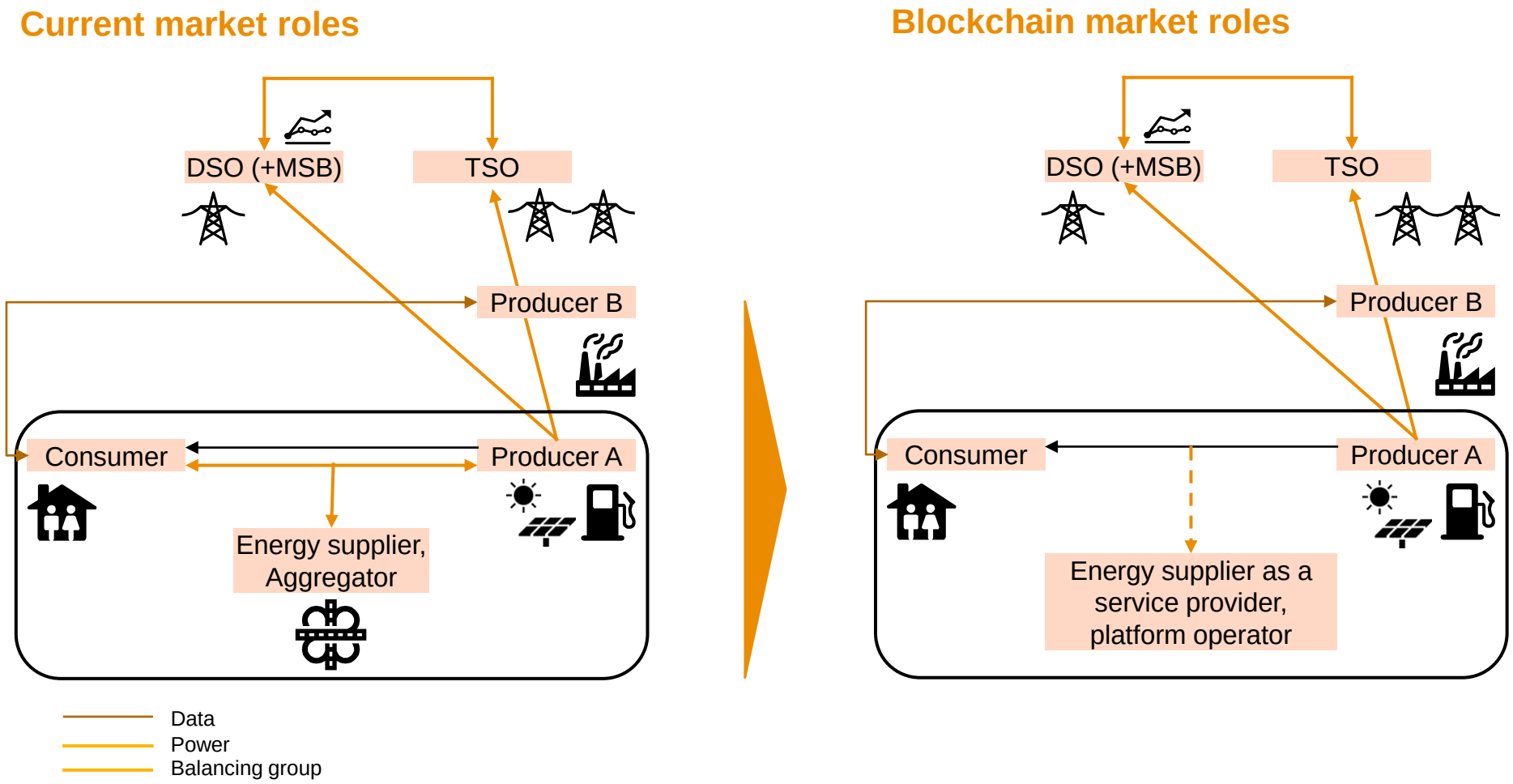
Smart contracts manage flows



The **microgrid** is a selected number of users that are connected virtually with IoT metering devices that send consumption and production data to the Blockchain. All users remain **connected to the DSO.**

The **smart contract** is fed with **real-time consumption and production data** from the microgrid. This information allows the smart contract to **match supply and demand** and to determine the **market clearing prices.**

The massive diffusion of Blockchain will be a significant challenge for the incumbent utility companies



*Recent study by the german federal ministry of education and Research

Catharina Geiselhart
catharina.geiselhart@pwc.com