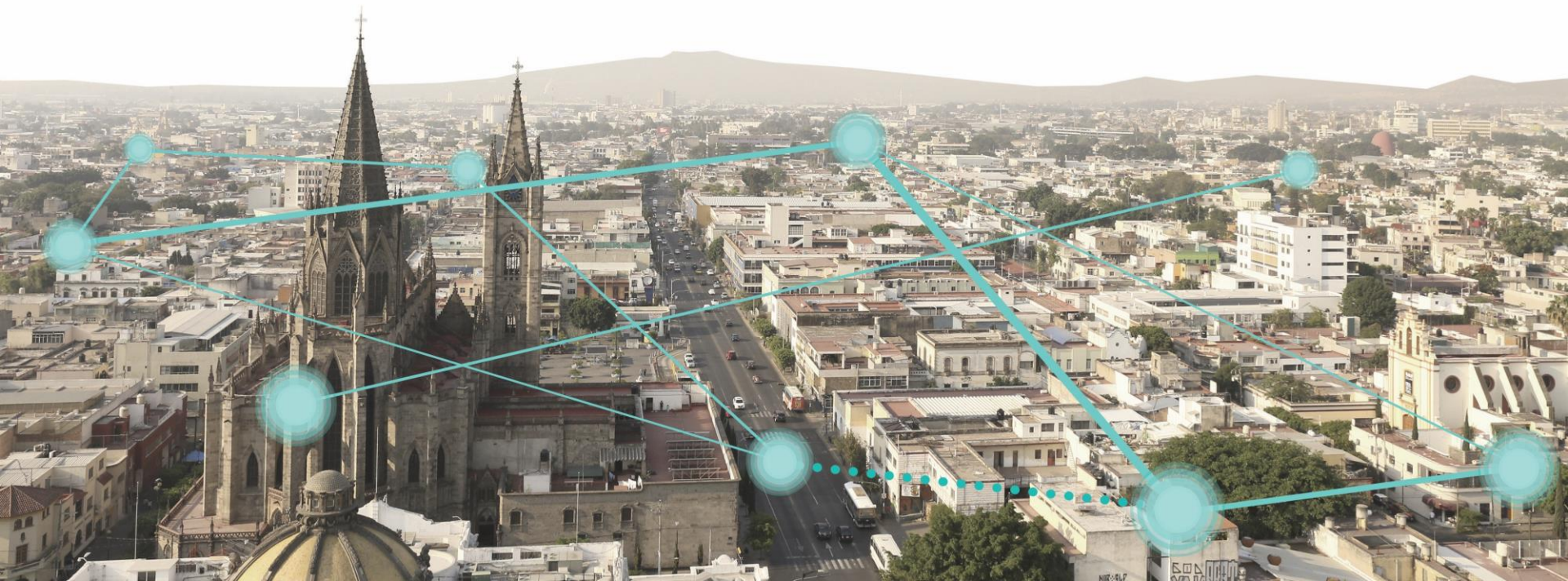




Blockchain as a game changer in the energy sector?

Viktor Peter | Blockchain Governance Expert | GIZ Blockchain Lab



Causes of digitization in the energy industry



Drivers of Digitisation: Improved IT

Improved IT



Di

Improved IT: Moore's Law





Drivers of Digitisation: Data

Improved IT

Data

Massive data growth

 **BEN Energy**

PLATFORM

PRODUKTE

KUNDEN

NUTZEN

CASES

KONTAKT



KUNDENVERHALTEN VORHERSAGEN
MIT PREDICTIVE ANALYTICS

omankmenta.com



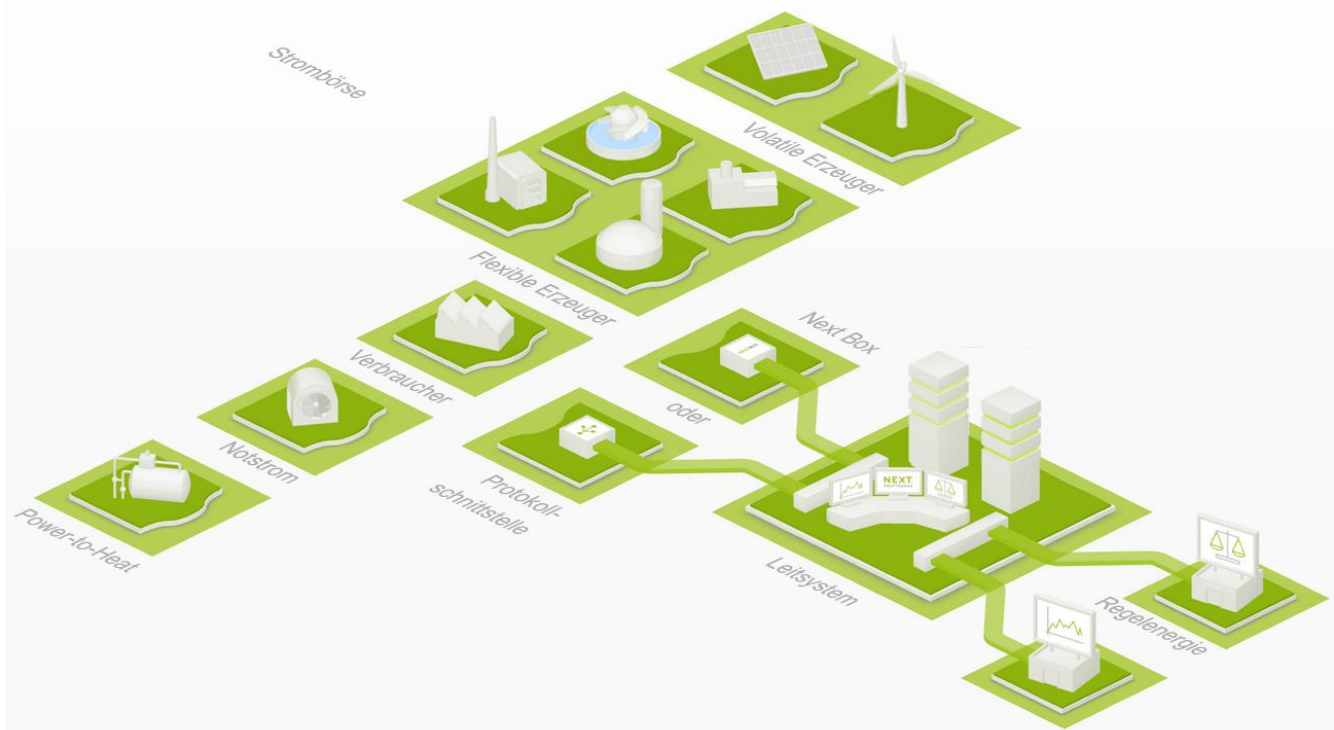
Drivers of Digitisation: Interconnectedness

Improved IT

Digitisation

Interconnectedness

Interconnectedness





Drivers of Digitisation: Price Erosion

Improved IT

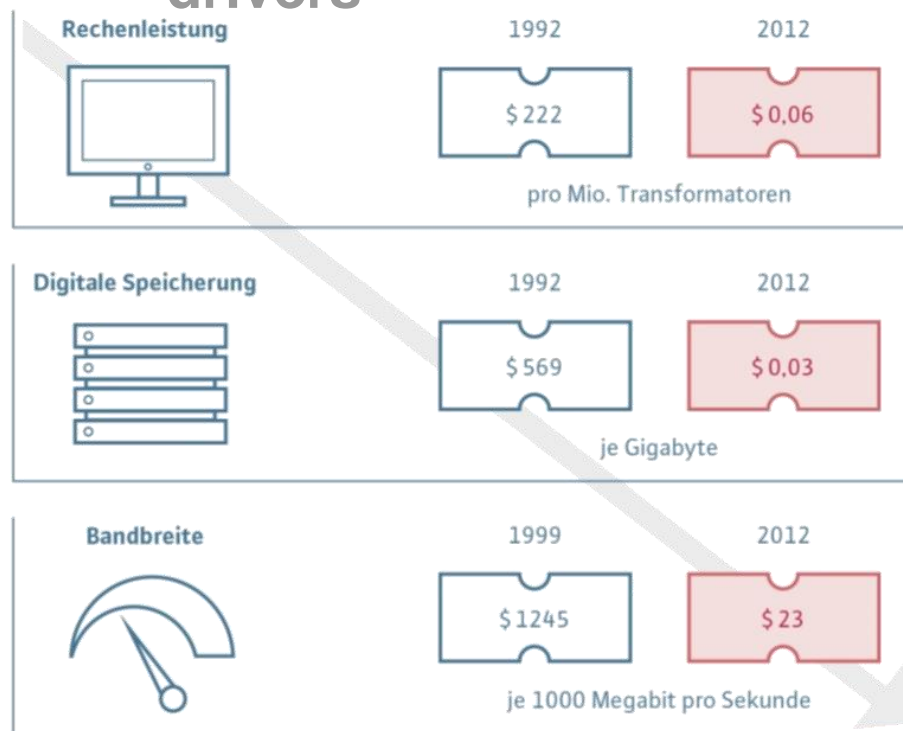
Data

Digitisation

Interconnectedness

Platforms

Massive price erosion of the drivers



* Hagel III, John et al. (2013): From exponential technologies to exponential innovation. Deloitte University Press.
Verfügbar unter: dupress.com/articles/from-exponential-technologies-to-exponential-innovation/ (adaptierte Darstellung)



Drivers of Digitisation: Platforms

Improved IT

Data

Digitisation

Interconnectedness

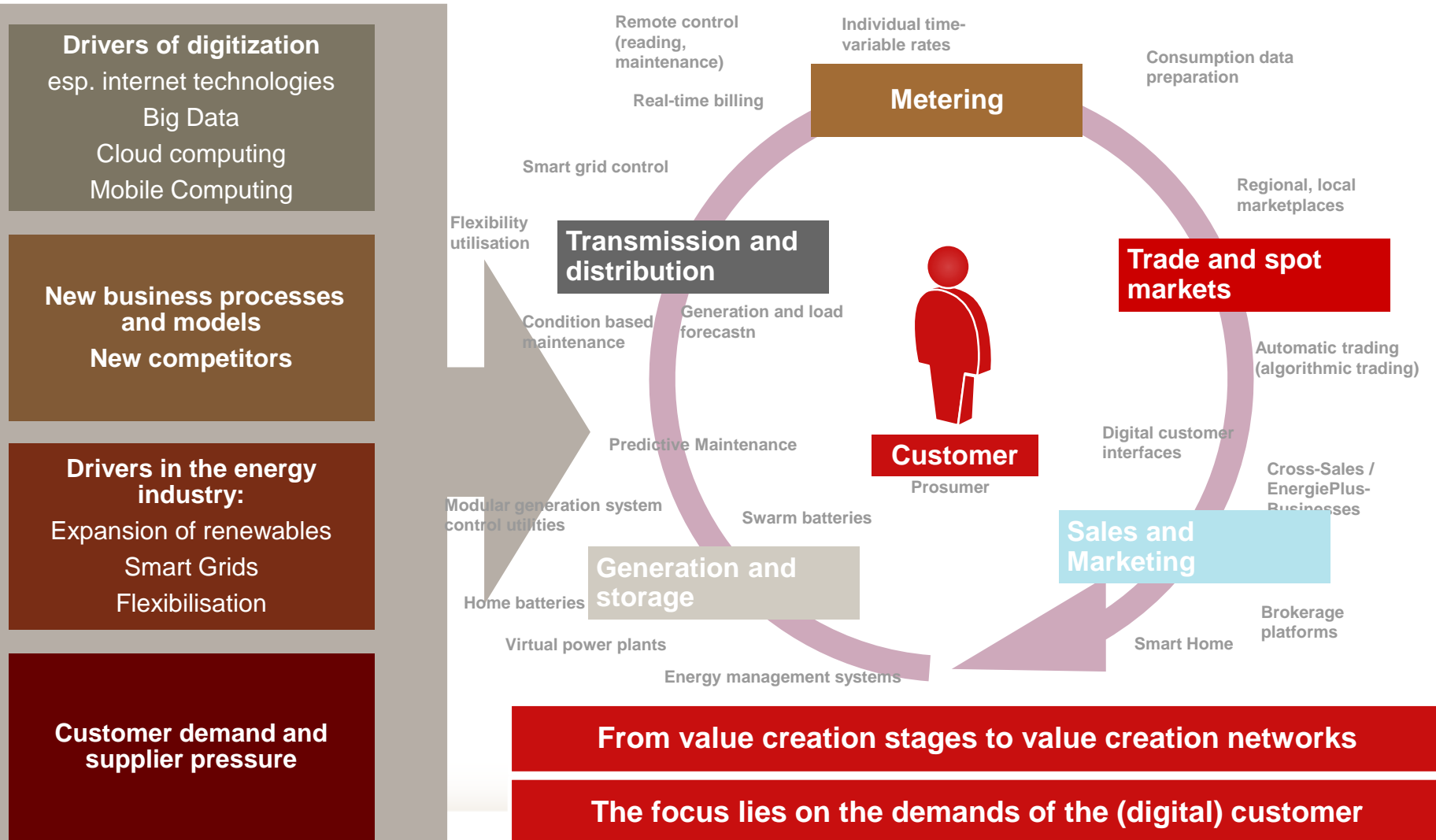
Platforms

Platforms





The characteristics of the digital Transformation and new business models





Cooperation Cooperation among different industries

- enercity and Daimler
 - Joint operation of a stationary battery storage device
 - Car battery storage for smart electric → "Living Storage" (Daimler)
 - Interconnection of more than 3,000 batteries, participation in the primary control energy market (enercity)
- **Combining specific industry knowledge for new business models**



enercity
positive energie



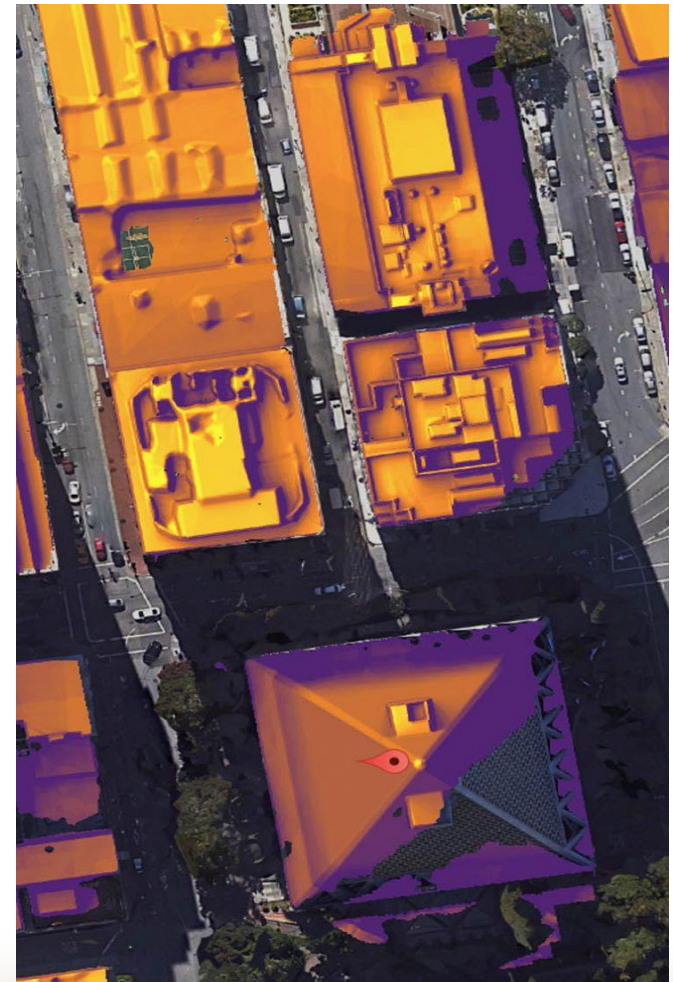
DAIMLER



Cooperation

Cooperation among different industries

- Eon and google: SunRoof
 - Joint operation of an IT-company and a utility/grid operator
 - Google provides data about house roofs based on Google Earth, Maps und Machine-Learning- Technologie
 - Eon provides data on accessibility of the house as well as grid data and gives users the possibility to finance their proposed solution
- **Combining specific industry knowledge for new business models**





Cooperation Cooperation with start-ups

- 500 energy-related start-ups in Germany
- 2/3 of all start-ups offer (rather) B2B-solutions [GER]
- They expand the industry as a whole
- Solutions often digital- or data-based
- **Cooperation as an important tool for both sides**





3. Cooperation

Cooperation with start-ups



Energy suppliers	Startups
<ul style="list-style-type: none">• Limited capacity for innovation• Large customer base and access• Local anchorage and networks• Brand!	<ul style="list-style-type: none">• New ideas and business models• No customers• No local networks• No brand

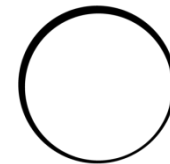
Source: ENERGIELOFT

Use cases in the German energy sector

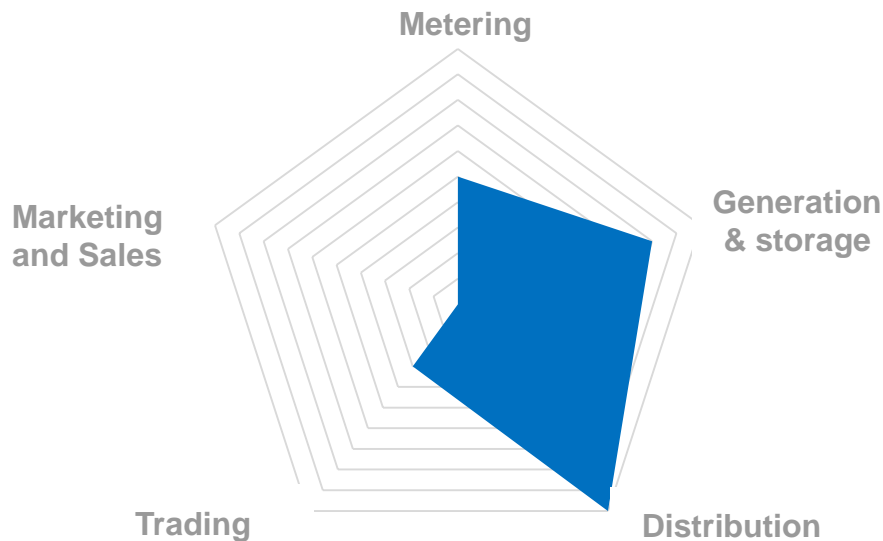




Redispatch and system stability



sonnen



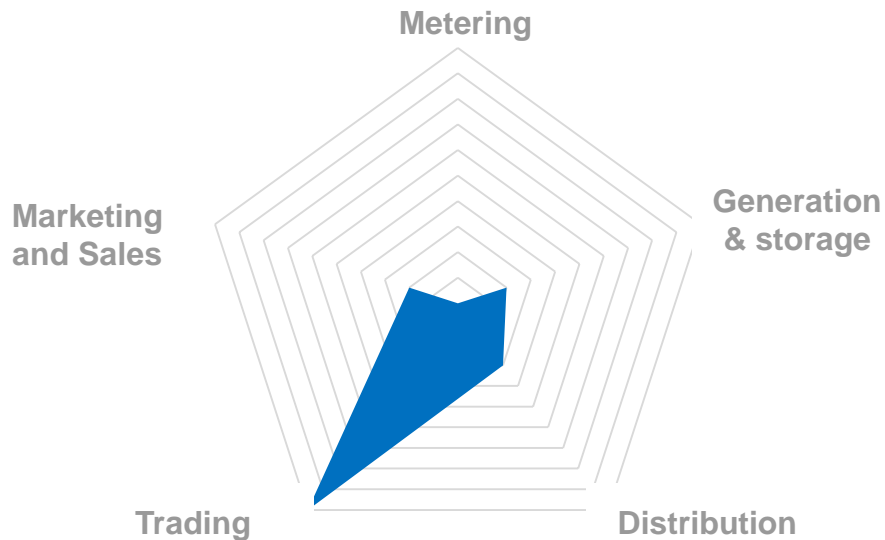
Blockchain: IBM Hyperledger Fabric

Goal	Advantages
<ul style="list-style-type: none">- Reduction of costs which stabilize the electricity grids (e.g. Redispatch, back up pr , turning off wind turbines,...)- Stabilizing the electricity grid	SECURITY AND RESILIENCE <ul style="list-style-type: none">- Blockchain as a „stability-tool“- connection, operation and transparency of the decentralised battery storages- Integration of decentralised electric flexibilities



Electricity wholesale

ener
chain



Blockchain: Tendermint

Goal

- Building and operation of a platform for energy trading without a central intermediary

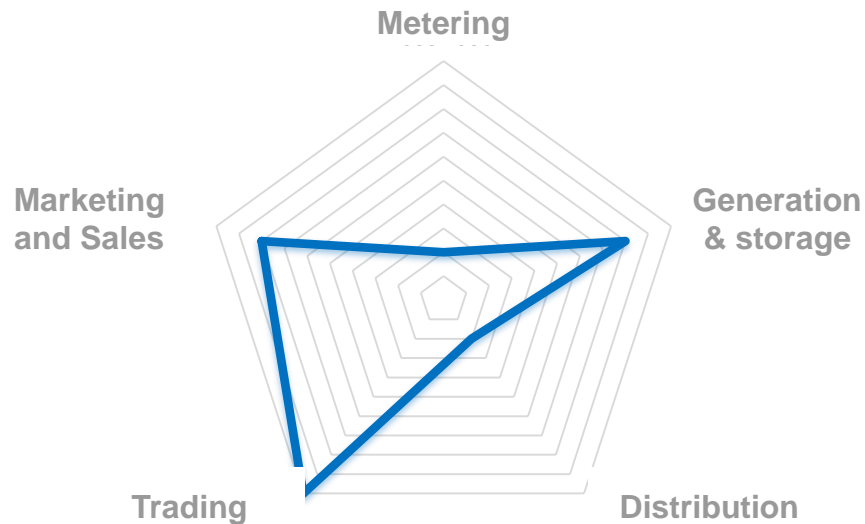
Advantages

DISINTERMEDIATION

- Trade data (offer, demand, price, volume, availability, etc. are put into blockchain based system
→ transparency, security, efficiency
- Trusted Transactions without a middleman



Peer-to-Peer Energy Trading



Blockchain: Ethereum/ IBM Hyperledger Fabric

Goal

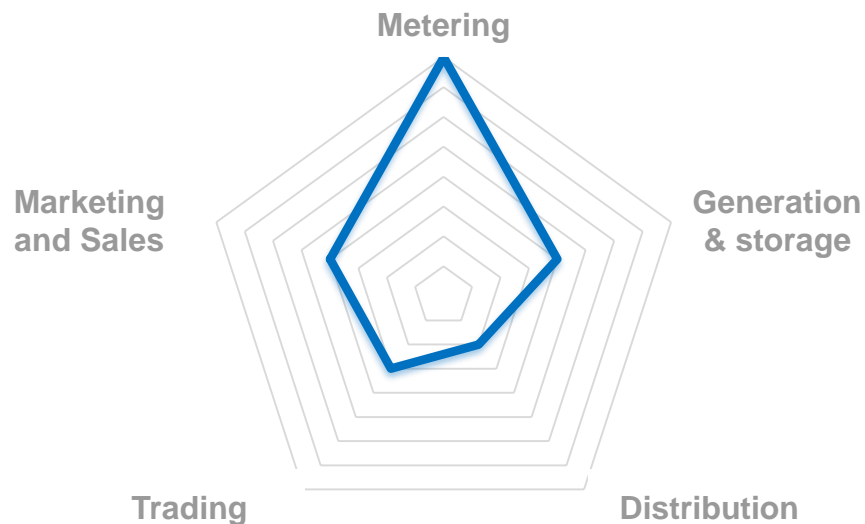
- Development and operation of an utility for the automatic direct connection of electricity generators and electricity consumers without intermediaries on the platform

Advantages

- **Direct transactions between consumer and producer**
- Trading data (supply, demand, price, quantities, purchase, etc.) are recorded on the blockchain
- Transparency, security, efficiency



Certification of renewable energy



Blockchain: Ethereum-clone (federated)

Goal

- Providing documentation and certification of renewable electricity generation

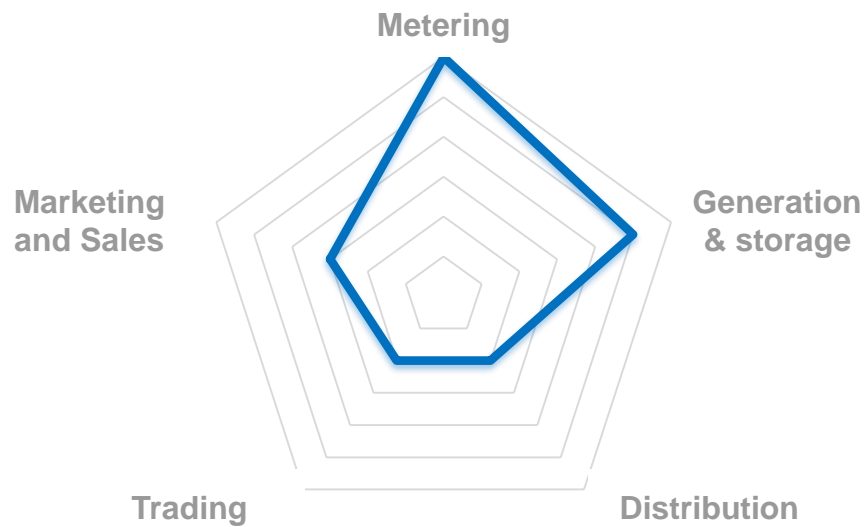
Advantages

- **Green electricity tariffs (based on blockchain documentation)**
- Blockchain as a ledger providing information if a utility is actually able to provide the amount of renewable electricity as stated
- Transparency about the feed-in to the grid



EV Charging payments

SHARE & CHARGE



Blockchain: Start: Ethereum | Now: EWF

Goal	Advantages
<ul style="list-style-type: none">- Providing documentation of charging of EV's and automate payments- Long-run: Car that pays for itself by feeding into the grid at price peaks	<ul style="list-style-type: none">- Automated, documented and secure payments based on blockchain- No roaming charges- Blockchain as a ledger providing information and allowing for real-time payments-

Potentials for the Mexican Energy Sector?





Potentials for blockchains in the Mexican Energy Sector

- **Green Energy Certification**
 - Blockchain as a provider of valid information
 - Allows new electricity products (green tariffs)
 - Incentivizes investments in RE
- **Peer2Peer-Trading in Distribution Grids**
 - Incentivizes investments in RE
 - Utilities can provide RE and maintenance
 - Revenue stream for grid operator maintained
 - Fostering local economies



Thank you!

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