



E-CONTROL



# **Blockchain**

## *Energy markets in chains?*

Dr. Clemens Wagner-Bruschek

Vienna, 13 June 2017

# Disclaimer

---



E-CONTROL

This presentation has been prepared for the seminar “Governance of Emerging Technologies” at the University of Natural Resources and Life Sciences (BOKU) in Vienna.

Any opinions expressed reflect the view of the author and do not necessarily coincide with those of E-Control or any of the other involved institutions.

The presentation or parts thereof may not be used or distributed outside the scope of the above mentioned seminar without prior permission.

Vienna, 13 June 2017



*Next steps?*

*Blockchain in energy markets*

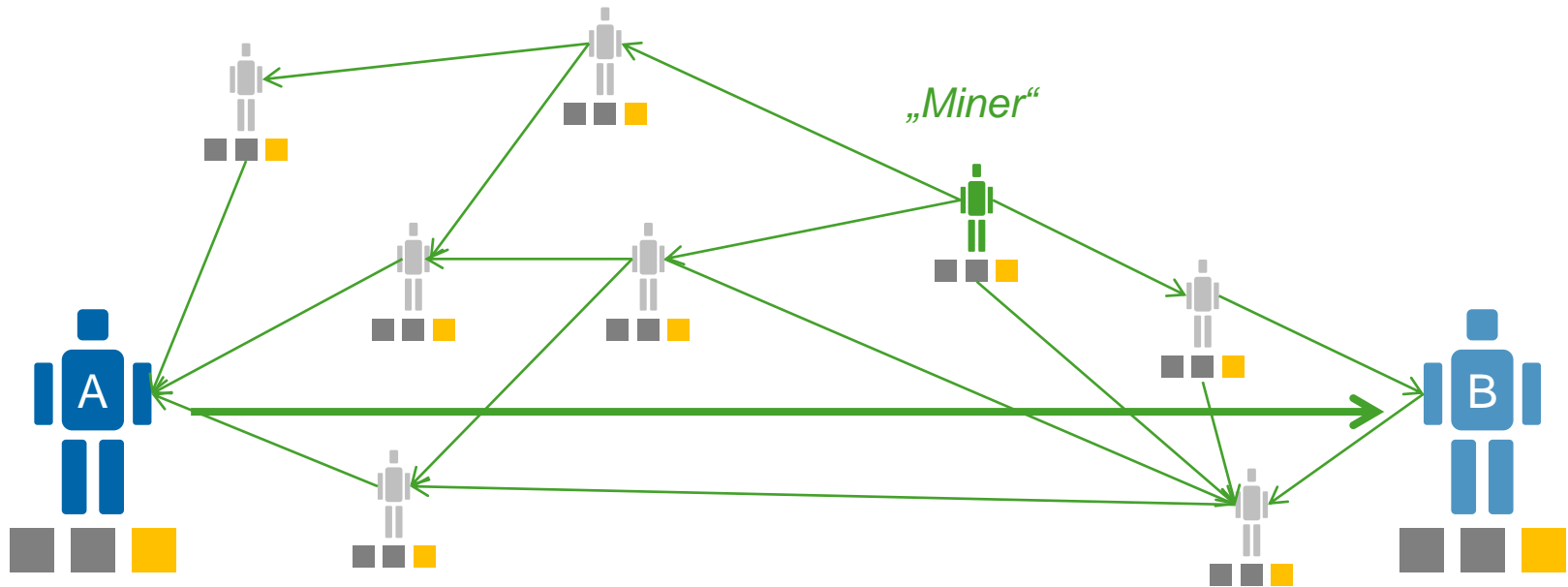
*Blockchain – a short review*



# Blockchain as a communication protocol



E-CONTROL



**MINIMUM REQUIREMENTS  
ON BLOCKCHAIN TO  
COMMUNICATE  
„TRANSACTIONS“:**

(A1) Proof of origin

→ *Digital signature*

(A2) Proof of funds

→ *Distributed Ledger*

(A3) Proof of usage

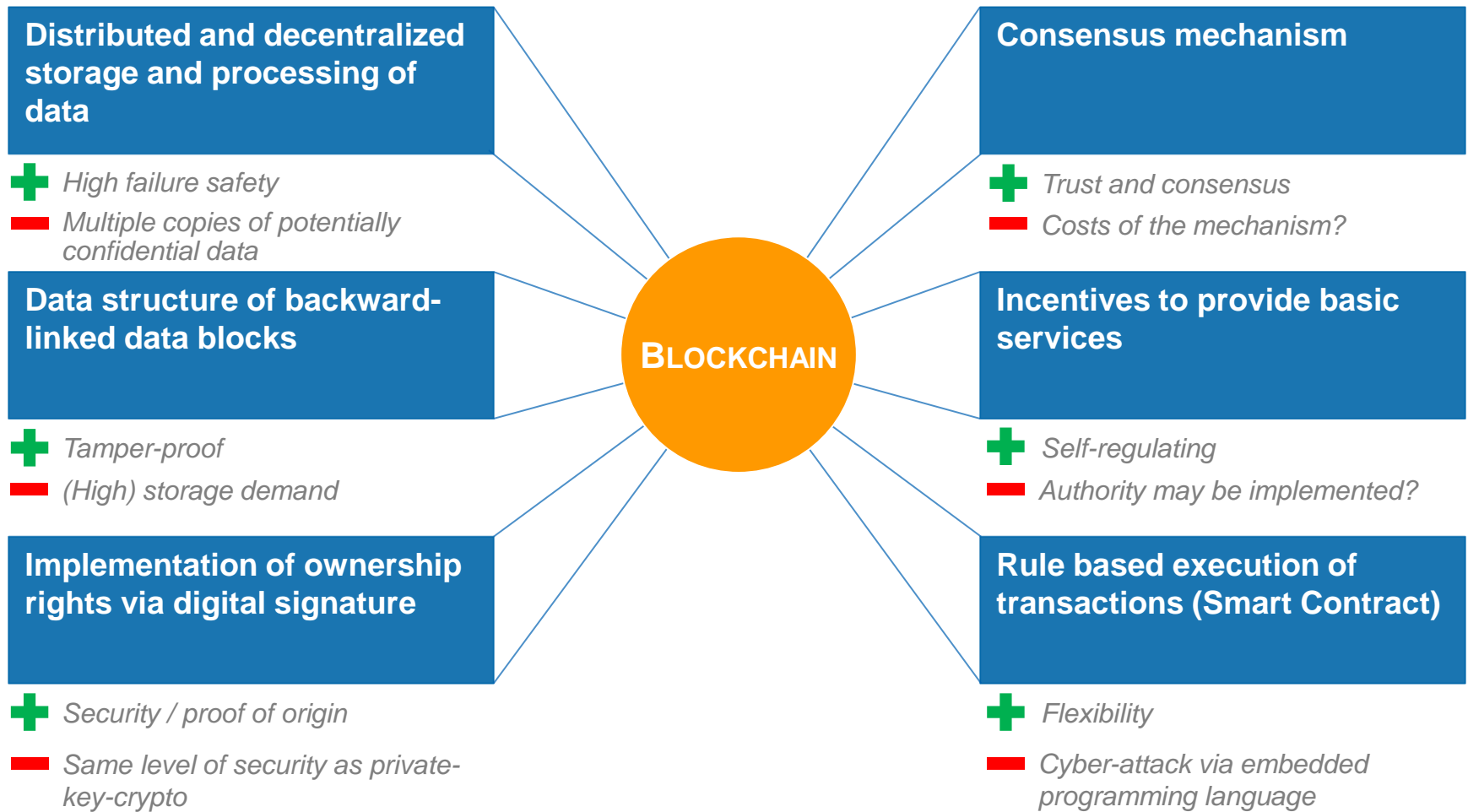
→ *Distributed verification*



# Key components of the blockchain technology



E-CONTROL





# (Potential) Applications of the blockchain technology



E-CONTROL

## FINANCE

- Crypto currencies
- Payment transactions
- Digital securities trading
- FX

## ENERGY TRADING

- Peer-to-peer trading
- Trading platforms
- Record keeping

## SMART GRIDS & IOT

- Handling of decentralized processes
- Management of Smart Home und Smart Grid

## PUBLIC SECTOR

- Digital identity
- Electronic certificates
- Electronic health record
- Land registration

**APPLICATIONS OF  
BLOCKCHAINS**  
(by generalizing “transactions”)

## DATA EXCHANGE

- Schedule management and matching
- Storage and reporting of metering values

## ASSET MANAGEMENT

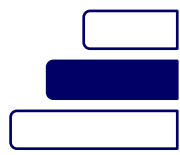
- Proof of ownership
- Management of asset data
- Etc.

## DECENTRALIZED AUTONOMOUS ORGANISATION (DAO)

- Semi-automated democratic investments
- (Vision: fully autonomous systems)

## REGULATORY COMPLIANCE

- REMIT/MiFIR/EMIR/... reporting
- Compliance with market rules
- Etc.



# Two categories of blockchain applications



E-CONTROL


## 1. Blockchain simplifies existing processes (i.e. reduces cost, etc.)

- “Blockchain as an IT-tool“
- No/low “disruption”
- Lower regulatory/legal barriers (?)
- Cost/benefit analysis required
- Faster implementation to be expected
- Examples comprise e.g.:
  - Reporting via blockchain
  - Supplier switching management
  - Etc.

## BLOCKCHAIN APPLICATIONS

## 2. Blockchain triggers new business models

- Blockchain as a „zeitgeisty concept“
- High regulatory/legal barriers (?)
- Slower implementation to be expected
- Examples comprise e.g.:
  - Peer-to-peer trading
  - Mobile charging
  - Etc.



# Next steps (as an energy regulator)

---

- Stay informed about developments in the field of blockchain technology
- Monitor developments
  - within energy markets (especially in faster developing markets); and
  - outside of energy markets (especially financial markets)
- Invite market participants / institutions to discuss
  - regulatory barriers; and
  - legal challenges.



## CONTACT



+ 43 1 24 7 24 714



Clemens.Wagner-Bruschek@e-control.at



[www.e-control.at](http://www.e-control.at)



# E-CONTROL

PROFITIEREN. WO IMMER SIE ENERGIE BRAUCHEN.