

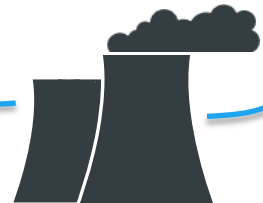
# Legal Questions surrounding the Blockchain & Bird & Bird

The 6th Vienna Forum on European Energy Law

Austrian Supreme Court of Justice

Vienna, 28 September 2018, 09.45 – 10.00

Dr. Matthias Lang





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# Overview

1. Background
2. Legal Questions

# 1. Background



# Background

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Article - March 2018

## What every utility CEO should know about blockchain

WIRED

Greens meet geeks

## Hope, hype and heresy as blockchains enter the energy business

*As yet, applications of the new technology have not lived up to expectations*

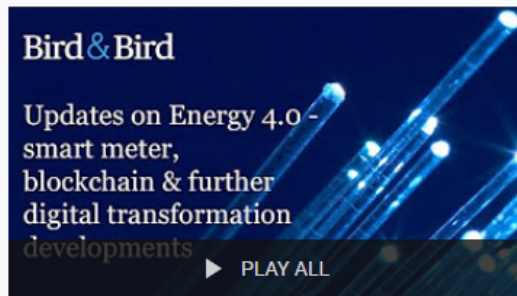


WIRED Energy

## Microgrids and the blockchain are powering our energy future

The era of large-scale power plants is (slowly) coming to an end. In its place is a new network of super-smart and super-clean energy systems

# Background



- 1 Bird & Bird Updates on Energy 4.0 - smart meter, blockchain & further digital transformation 8:19 Bird & Bird Deutschland
- 2 Bird & Bird Update Energie 4.0: Smart Meter, Blockchain & weitere digitale Transformation 8:16 Bird & Bird Deutschland
- 3 Bird & Bird Energie 4.0 - die digitalisierte Zukunft der Energieversorgung 9:46 Bird & Bird Deutschland
- 4 Bird & Bird Elektromobilität - Kernthemen aus regulatorischen, haftungs- und vertraglicher Sicht 12:43 Bird & Bird Deutschland
- 5 Bird & Bird Energie 4.0 - Die Digitalisierung der Energiewirtschaft - Neueste Themen, neueste Updates 8:29 Bird & Bird Deutschland



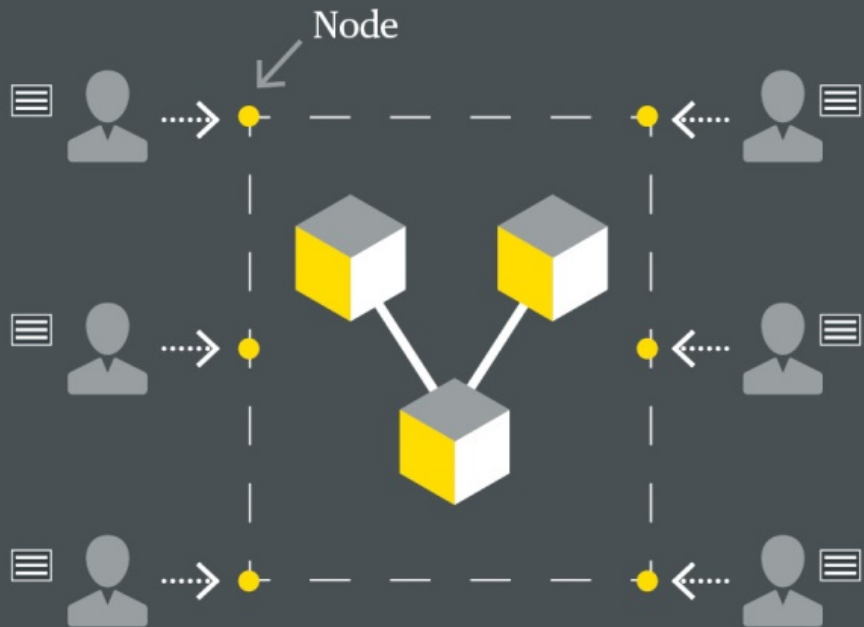
## Blockchain - An overview & the legal issues

Bird & Bird partner Jonny Emmanuel talks about blockchain: what is it, how does it work and what are some of the legal issues, based on his experience advising clients in this space.

# Background

## Nodes

1

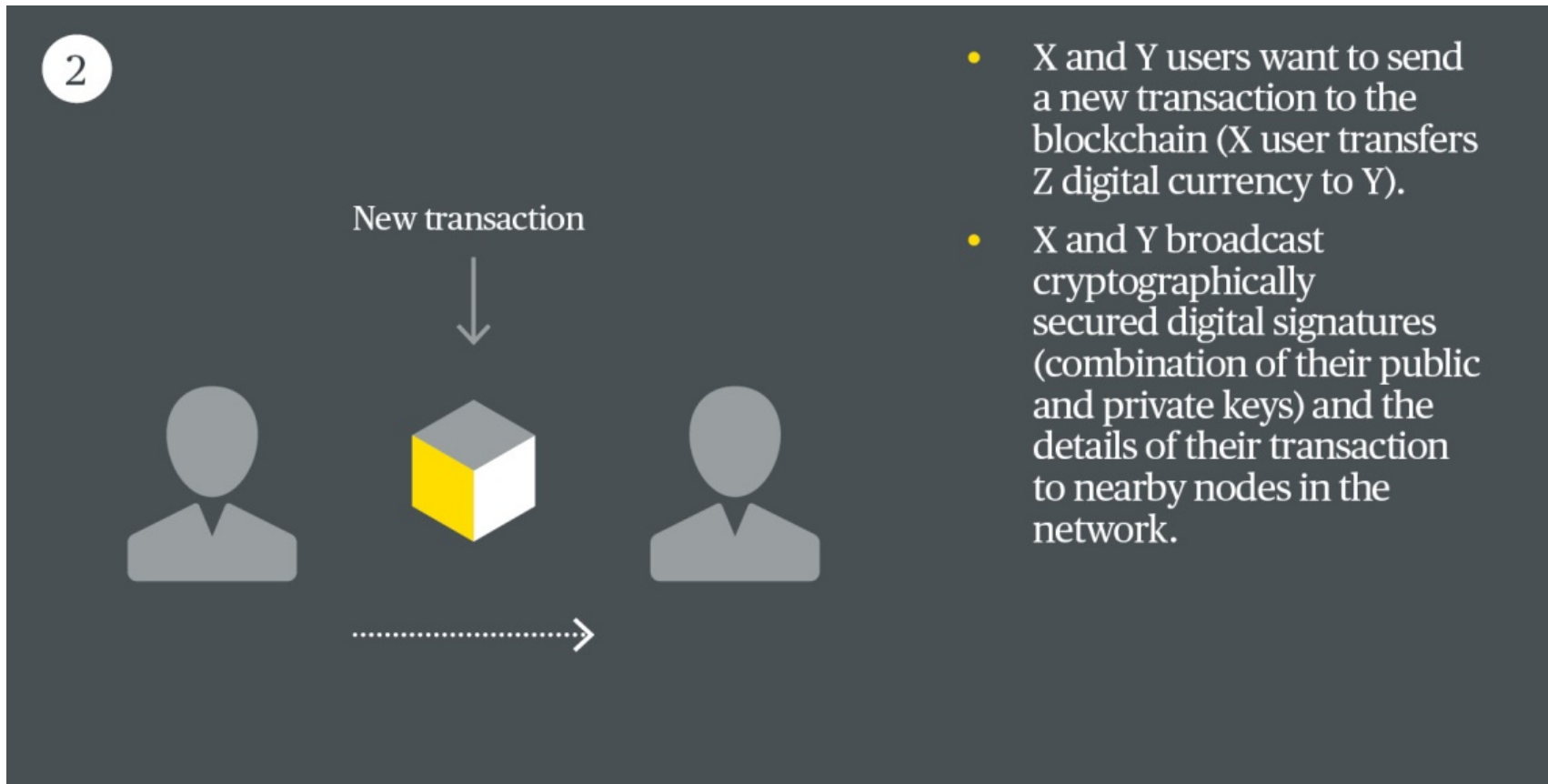


The diagram illustrates a blockchain network. It features six user icons arranged in a 3x2 grid. Each user icon is connected to a central yellow dot, which represents a node. Dashed lines connect these nodes in a grid pattern. In the center of the network, three 3D cubes represent blocks. Two blocks are positioned at the top, and one block is positioned below them, connected by solid lines, forming a simple chain structure. An arrow labeled 'Node' points to the top-left yellow dot.

- Blockchain software installed and running by user on a machine is called a node.
- Each node stores a copy of the database (list of transactions).
- Nodes used to set up accounts (used by users to participate in the blockchain: create and send new transactions).
- Private keys (a secret number generated for an account) are used to operate accounts.
- Public keys (a public number generated for an account) identify each account on the blockchain.

# Background

## New Transaction





# Background

## Validation

3

New transaction validated

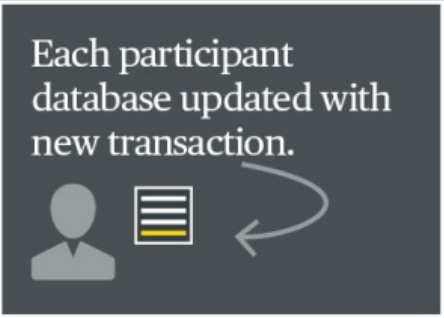
• Transactions are sent by accounts and validated in accordance with the consensus protocol (process embedded in the blockchain software used by nodes to reach agreement on whether a transaction can be validated).

• There are different consensus protocols used by different blockchain networks. “Proof of work” is used for the Bitcoin blockchain. Proof of work involves mining.

# Background

## Blockchain Record

4 Each participant database updated with new transaction.



The diagram shows a participant database update. A person icon is connected to a document icon with a curved arrow pointing to it. Below this, a network of four yellow and white cubes is shown. Three cubes are connected to a fourth cube that is surrounded by a circular pattern of dots and lines, representing a node in a blockchain network.

- Once a transaction is validated it is recorded on the blockchain.
- Assuming nodes follow the proof of work consensus protocol:
  - Nearby nodes invest compute power to solve a mathematical puzzle required to produce the next block within which the proposed transaction is recorded (this is mining)
  - When the first node solves the mathematical puzzle they win a fee and the pending transaction is recorded in a new block of data
  - That new block is double checked by other members of the network until a majority agrees it is correct and then its added to the blockchain and becomes part of the database

# Background

## Blockchain & Nutshell

- Blockchain is a database of all transactions across a peer-to-peer network
  - For details, see [Satoshi Nakamoto](#)
- Seen as the main technical innovation of Bitcoin and other cryptocurrencies
  - But not limited to cryptocurrencies
- There are different blockchain flavors
  - Public blockchain: open and anyone can participate, decentralised, typically has an incentivizing mechanism to encourage more participants to join, special security/consensus features (e.g. proof of work, proof of stake), needs substantial amount of (computational) power, Bitcoin best known public blockchain network, slower
  - Private blockchain: Requires invitation and validation by network starter or his rules, pre-approved participants, known identities, centralised, permissioned read and/or write, faster

# Background

## Blockchain & Business Model

- Missing basis for blockchain business models?
  - Technical: "It's never going to work"
  - Regulatory: "Our regulatory framework does not allow this"
  - Commercial: "It's impossible to make money with this"
- Lack of vision
  - Google: "Stupid idea to think that you can make money with a free internet search engine"
  - Amazon: "I have a great local bookstore – don't need an internet one"
  - Twitter: "You cannot say anything meaningful with 140 characters"
  - Apple: "I already have a great mobile phone"

# Background

## Blockchain & Physics

- Blockchain moves/stores data, not power
- Energy is physical, requires generation/production, storage, transformation, transportation and delivery
- "Energy supply is not a computer game, but the real world"
- Someone needs to make sure that the energy physically gets to where it is supposed to go. Really. Reliably. Lawfully. Always
- On the other hand
  - Renewables have led to vast increase in number of decentralised, intermittent producers, with ever increasing need to balance supply and demand, ever increasing data requirements to match supply and demand
  - Data ever increasingly relevant to supply power, really, reliably, lawfully, always
- Need to understand interdependence to understand and resolve legal issues

# Background

## Blockchain & Energy Digitalisation

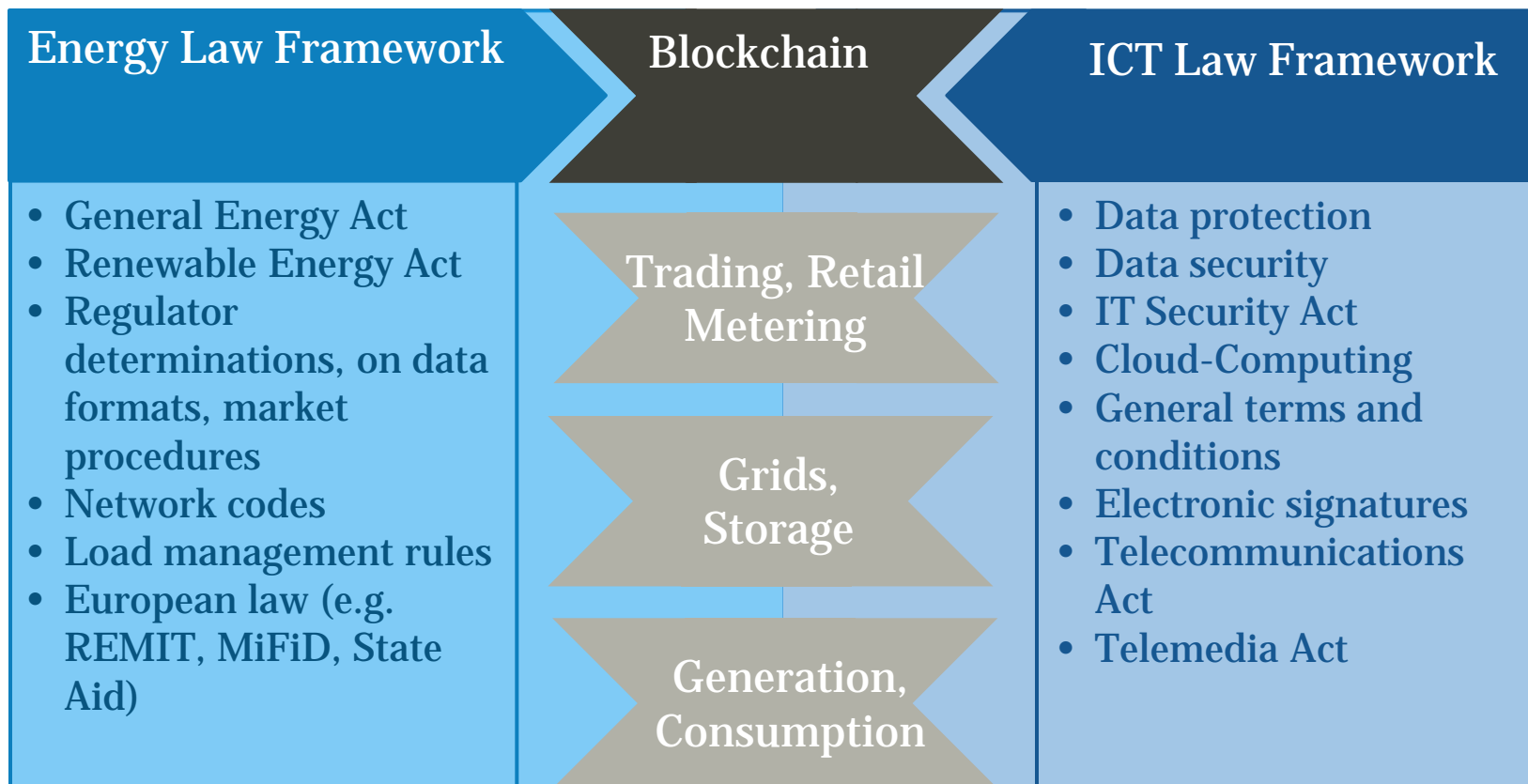
- Blockchain part of broader energy digitalisation challenge
- Modern technology meets existing energy law landscape not originally designed to address specific challenges and opportunities of digital world
- Digital, internet driven industries historically did not heat homes or produced the power to run the computers
- Tech & Comms legal framework not geared towards very long term investments in industrial assets, with different security of supply concepts
- Energy digitalisation means combining two previously separate, strongly regulated worlds with different rules
- Challenge: Ensuring that legal system work in such a way that secure, inexpensive, efficient and consumer and environmentally friendly energy will be available also in tomorrow's digital world



## 2. Legal Questions

# Background

## Two Worlds Collide (e.g. Germany)





# Legal Question

## Blockchain & Legal Issues

- Key Issue is to identify relevant issues for energy sector
- Examples of currently discussed issues
  - Energy law, including renewables law, grid law, competition law, market access
  - Commercial law, including smart contracts
  - Data protection law, including GDPR
  - Financial markets law, including REMIT, MiFID
  - Tax law
  - And more
- Harmonisation on international level, including EU?
- Getting blockchain platforms to work in practice

# Legal Question

## Blockchain & Renewables

- Idea: Promote buying, selling or trading of clean energy between individuals (peer-to-peer trading)
- 2016 initiative by Brooklyn Microgrid (BMG), with owners of PV systems selling their power in the neighbourhood using Ethereum blockchain
  - Communal energy network, with utility provider still maintaining and balancing the electrical grid, the actual energy is generated, stored, and traded locally by members of the community
- But: Potential tensions with national energy and renewables support regimes
  - Allocation of grid fees and renewables transfer payments to directly traded energy?
  - Regulatory requirements for energy suppliers?
  - Binding rules for energy supply agreements?

# Legal Question

## Blockchain & Commercial Law

- Smart contracts too smart for the law?
- The easy part: Smart contracts are computer protocols that embed the terms and conditions of a contract
- The attractive part: Many kinds of contractual clauses may be made partially or fully self-executing, self-enforcing, or both
- The difficult part: Things go wrong. Drafting a contract (and code) that takes into account all possible contingencies and states all their responses is not possible
  - How do you deal with unforeseen events that lead to unexpected behaviour of the smart contract or errors in the computer code?
  - How do you get all applicable legal rules into the code, from which country?
  - Consumer protection?
  - How do you explain it to a judge?

# Legal Question

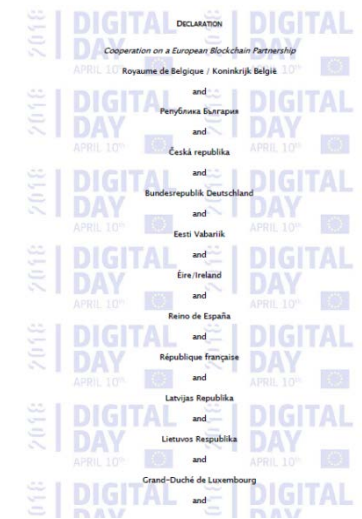
## Blockchain & GDPR

- GDPR harmonises EU data protection regulations, but conceptually predates blockchain
- Issue: blockchains are in principle growing, append-only databases, where data is added, not removed
- GDPR gives individuals right to have their data changed to ensure accuracy or erased
- In permissionless blockchain difficult to identify responsible "data controller"
- GDPR requirement of equivalent level of protection for transfer of data outside EU
- To be resolved. Privacy by design?

# Legal Question

## Blockchain & European Union

- It's just starting
- October 2017 European Council asked Commission to look into blockchain
- February 2018 Commission launches EU Blockchain Observatory and Forum
- 10 April 2018 Blockchain Partnership Declaration
  - Signed by 25 EU Member States: Austria, Belgium, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK, Greece, Romania, Denmark, Cyprus, plus Norway
  - Shall support the delivery of cross-border digital public services, with the highest standards of security and privacy



# Legal Question

## Blockchain & Simple Lawyers

- We are just starting to understand the legal implications
- Get your experts together from different areas
  - Energy lawyers
  - Commercial lawyers
  - Data protection lawyers
  - Banking lawyers
  - IP lawyers
  - Tax lawyers
  - Common sense lawyers...
- We'll surely find a solution to all the exciting new challenges

Thank you & Bird & Bird

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