



# Bird & Bird & Digitalisation maturity across the energy value chain

ACES Digital Transformation of Energy 2019

Enterprise digital platforms - enabling system level solutions and business models

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2. Blockchain & Smart Contracts - influencing digitalisation in the energy value chain
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# 1. Energy law and Digitalisation – a classification



# 1. Law and Digitalisation – a classification

## *Legal digitalisation maturity?*

- Digitalisation is a key instrument in the future energy transition
- Along the energy value chain digitalisation has been used for a long time for backend solutions – energy digitalisation is more about future frontend business models
- Future digital business models need a secure legal framework to be able to develop
- **But:** Digitalisation in the energy sector is still in the legal developing phase
  - Therefore a secure legal framework is still developing
  - Digitalisation across the energy value chain is still maturing

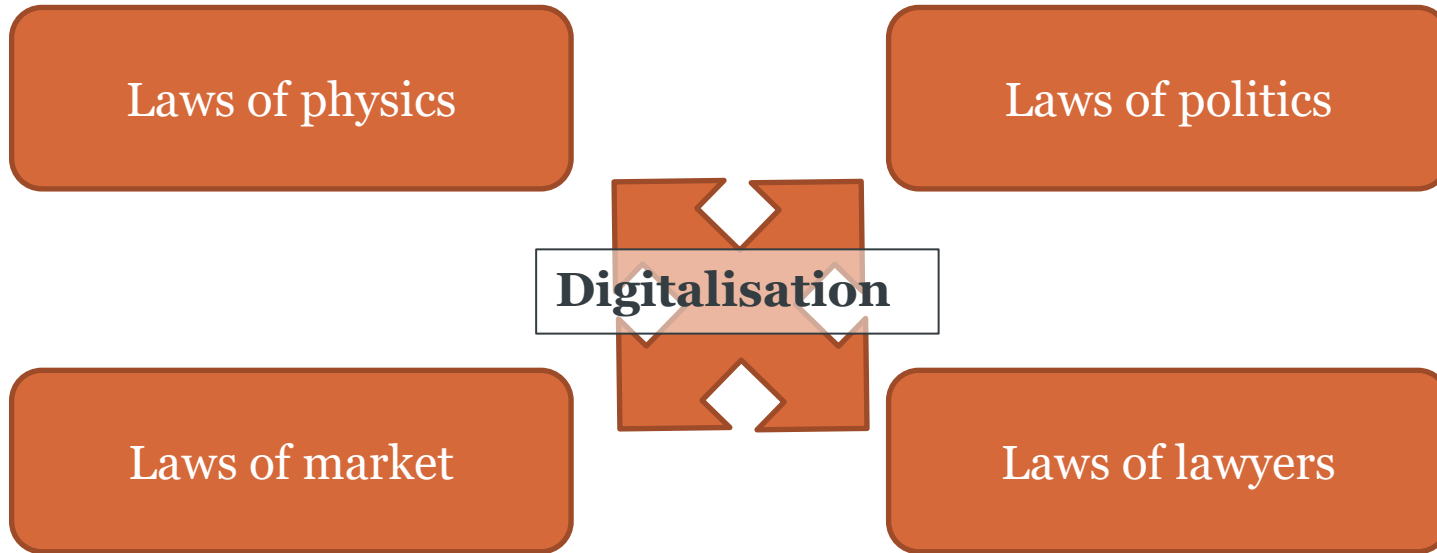
Different approaches to utilise digitalisation in the energy sector:

→ Implementing new technologies: Blockchain

→ Setting up a digital framework:  
Clean Energy for all Europeans package

# 1. Law and Digitalisation

*Different fields of laws*





## 2. Blockchain & Smart Contracts - influencing digitalisation in the energy value chain

# Smart Contracts - influencing digitalisation in the energy value chain

## *Smart Contracts in a nutshell*

- Promises in digital form, performed by the parties within protocols
- Highly compatible with Blockchain technology
  - Ethereum combines Blockchain and Smart Contracts
  - Platform with programming language
  - Suitable for any transaction that can be defined mathematically



source: <https://www.ethereum.org/>

# Smart Contracts - influencing digitalisation in the energy value chain

## *Smart Contracts in a nutshell*

- Example for a promise, performed by the parties within protocols:



- The vending machine

Smart contracts are mature digital applications, which are able to fulfill digital promises  
**But:** little use cases and no possibility to adapt to deviations from the protocols



## 2. Blockchain & digitalisation of the energy value chain

### *Blockchain in a nutshell*

Blockchain is a distributed, decentralized ledger

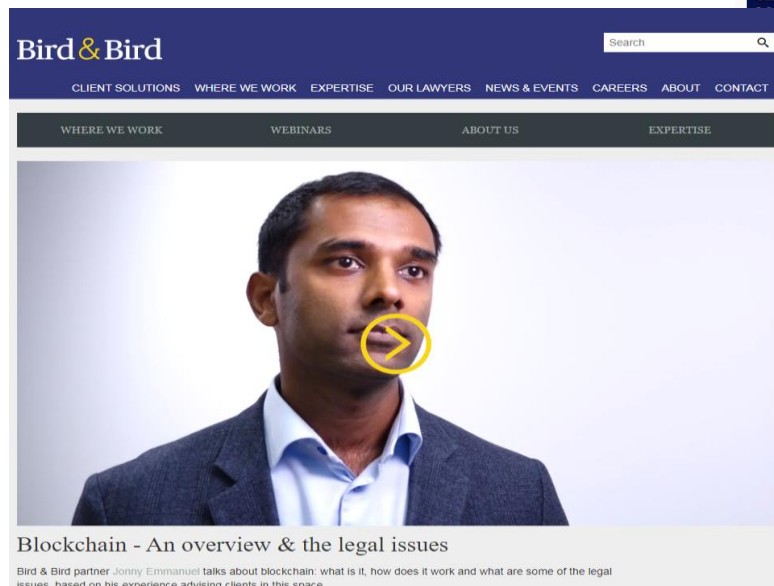
- Growing list of records ("blocks") that are linked using cryptography
- Once recorded, data in any given block cannot be altered retroactively without alteration of all subsequent blocks
- Peer-to-peer transfers of value
- Conceptually, no need for an intermediary

Seen as the main technical innovation of Bitcoin and other cryptocurrencies

- But not limited to cryptocurrencies

## 2. Blockchain & digitalisation of the energy value chain

### *Blockchain in a nutshell*



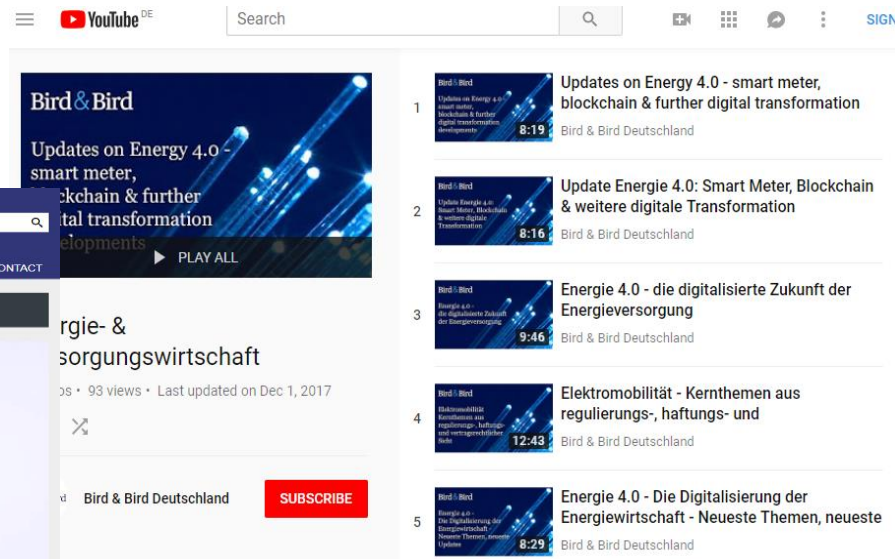
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**Blockchain - An overview & the legal issues**

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.



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## 2. Blockchain & digitalisation of the energy value chain

### *Blockchain & Physics*

- Blockchain moves/stores data, not power or molecules
- 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

## 2. Blockchain & digitalisation of the energy value chain

### *Blockchain & Physics*

- 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, which occur in many different legal areas such as:
  - Contract law
  - Data protection law
  - European law
  - Consumer protection law
  - Financial market regulation

## 2. Legal issues of Blockchain

### *Contract Law*

- The attractive part: automatic performance and enforcement of legal obligations
  - *"no room to bring an action for breach when breach is impossible"*
- 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

Coders will have to cooperate with lawyers to ensure legally sound design of the contract & reasonably bulletproof contract code

## 2. Legal issues of Blockchain

### *Data Protection Law*

- EU General Data Protection Regulation (GDPR), in force since 2018, especially protects 'personal data'
  - Any information relating to an identified or identifiable natural person
  - Even pseudonymized information, e.g. IP addresses
    - ➔ Blockchain: transactional data linked to a person & pseudonymized public key can be personal data
- Rights of data subjects (example):
  - Right to rectification of inaccurate personal data (Art. 16) and right to erasure of personal data (Art. 17)
    - ➔ Blockchain is an immutable, append-only ledger...

# 3. Clean Energy for all Europeans – Digitalisation in European Law

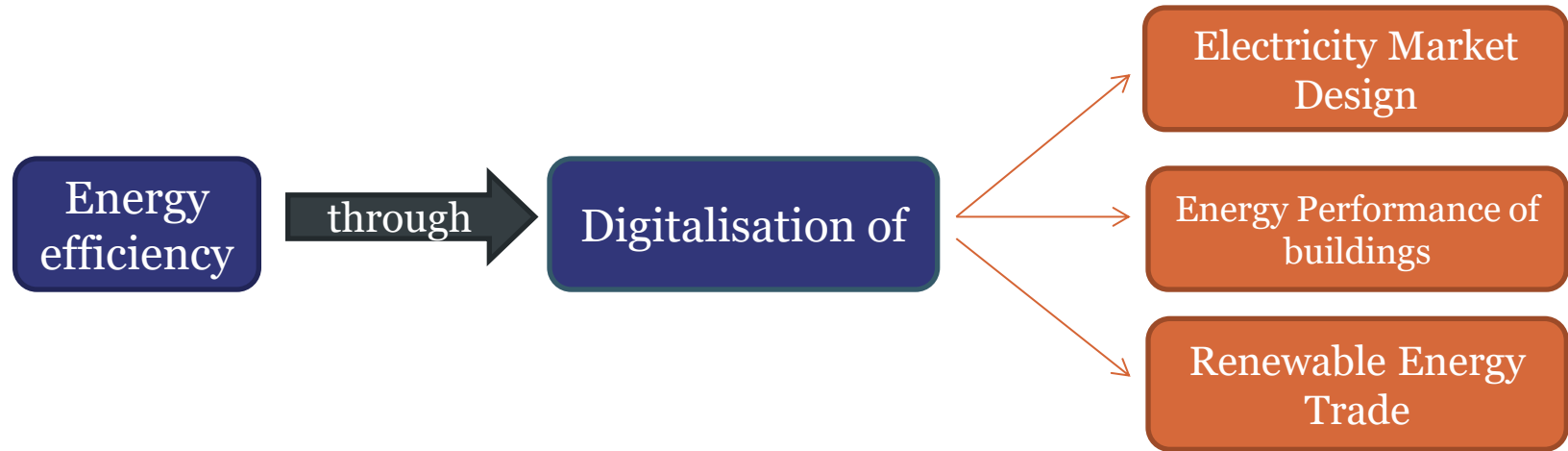


### 3. Clean Energy for all Europeans Package

#### *Main topics affected by digitalisation*

The 'Winter Package' consists of a package of legislative measures to facilitate the transition to a clean energy economy.

Digitalisation is not at the core of the Clean Energy Package. The revised legal framework reinforces the cooperation of all market participants in order to generate more energy efficiency, often indirectly furthering digitalisation.





# 3. Clean Energy for all Europeans Package

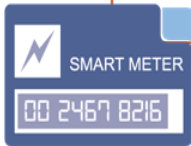
## *Electricity Market Design & Digitalisation*

Electricity Directive (EU) 2019/944 and Electricity Regulation (EU) 2019/943 update the existing electricity market rules based on Directive 2009/72/EC.

Member States have until 31 December 2020 to transpose the Electricity Directive into national law.

Energy digitalisation part of the new rules in form of:

Smart Meter



Data Management



Smart Grid



### 3. Clean Energy for all Europeans – Digitalisation in European Law

#### *Electricity Market Design & Smart Meters*

- Benefits for consumers
  - Electricity Directive gives consumers a right to request a smart meter (after and a dynamic electricity pricing contract to be able to profit from the digitalisation of the energy system
  - new electricity market rules allow consumers to directly participate in the market through the use of smart meters
  - Smart meters enable consumers to participate in demand response programs, react to market price signals to adjust their consumption and benefit from lower electricity bills

## 3. Clean Energy for all Europeans – Digitalisation in European Law

### *Electricity Market Design & Smart Meters*

#### Member States

- required to rollout smart meters, subject to a positive cost-benefit-analysis
- At least 80 per cent of final customers shall be equipped with smart meters within seven years of a positive cost-benefit-analysis or by 2024, where Member States have already begun a smart meter rollout before entry into force of the Electricity Directive

#### Functionality

- Smart meters have to satisfy minimum functional and technical standards being able to provide information on
  - actual electricity consumption
  - actual time of use
  - historical consumption

# 4. Conclusion



# Conclusion

- Key areas of energy digitalisation have become legally mature
- Digitalisation across the energy value chain starts to integrate innovative technologies like blockchain and continuous to amend the legal energy framework
- Technologies like blockchain play an increasing role in the energy industry – industry players, computer people and lawyers will need to make them work
- The European Clean Energy Package takes an important step towards utilising digital solutions for the clean energy transition and building a more flexible electricity system, but is only an early step towards a more comprehensive, mature and digital legal framework



# Thank you & Bird & Bird

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