INSTITUTE
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POLITICS AND
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Blockchain infrastructure for a smarter energy sector.

A primer on liability.

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Outline

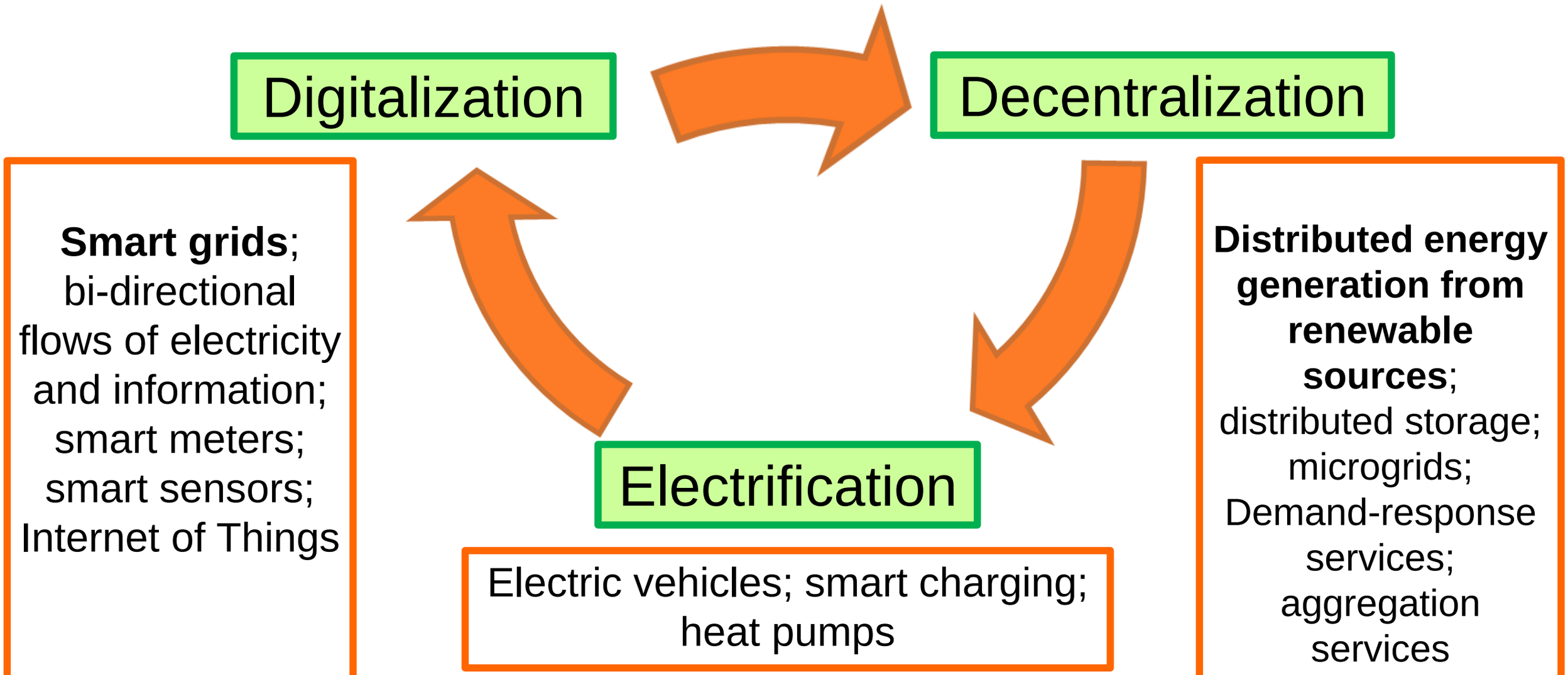
1. Context: technological transformation of the energy sector

2. Blockchain and smart contracts: the case of energy sector

3. Mapping liability in blockchain-running smart grids (*permissionless* vs. *permissioned*)

4. Final remarks

Context: technological transformation of the energy sector



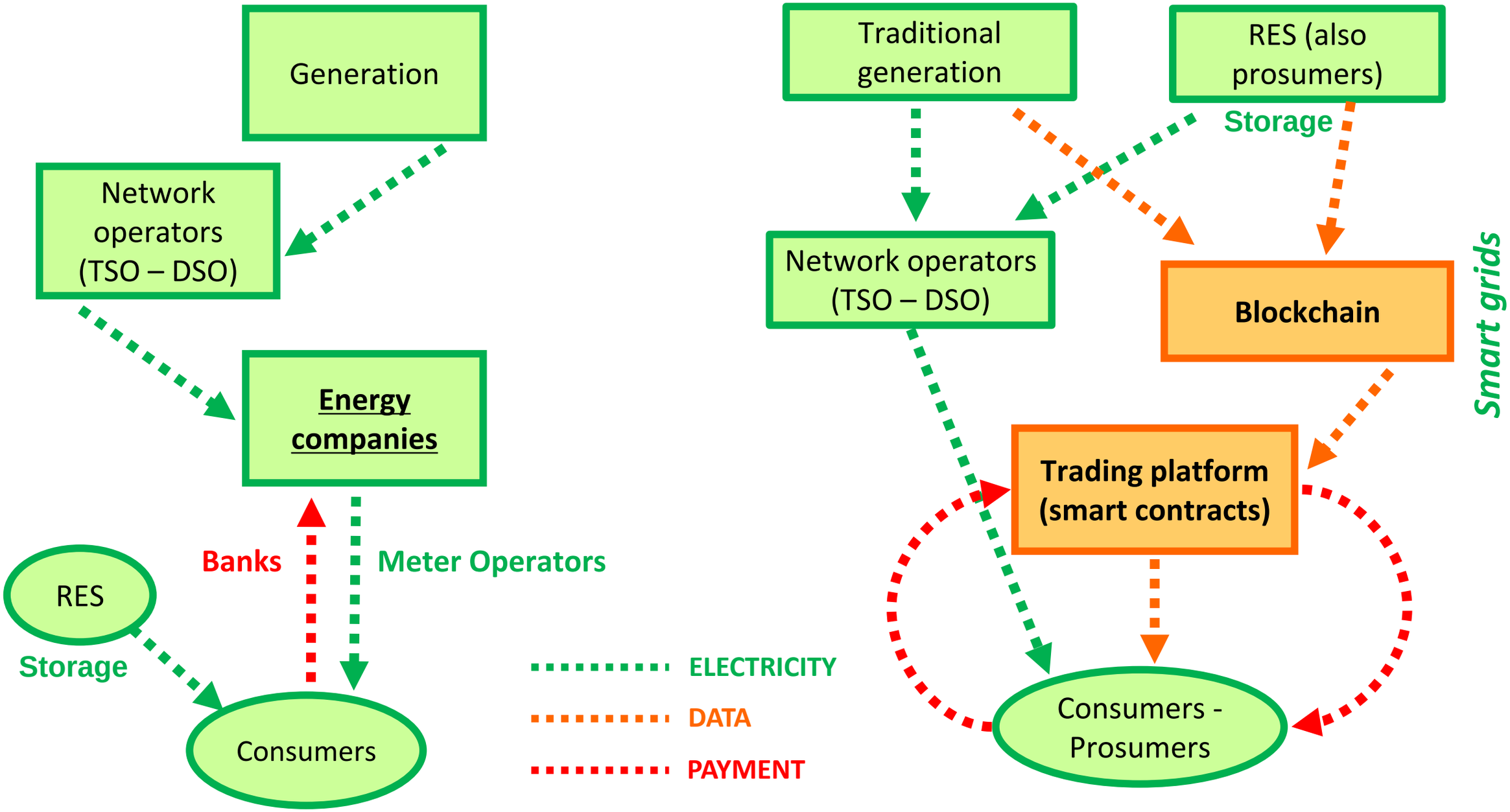
Context: technological transformation of the energy sector
Blockchain in energy transactions

- Blockchain intends to remove of third-party intermediation.
- Blockchain weakens the energy suppliers: **blockchain participants manage themselves energy transactions**.
- Liable subject to consumers difficult to identify where no intermediation exists.

How to allocate liabilities in case of dysfunctions of the digital system?

Goal(s): high level of consumer/prosumer protection
Art. 16(1) let. c, Directive 2019 on common rules for the internal market for electricity entering into force on January 2021: "*Member States shall provide an enabling regulatory framework for citizen energy communities ensuring that: […]* ***members or shareholders of a citizen energy community do not lose their rights and obligations as household customers or active customers***".

Blockchain and smart contracts
The case of energy sector



Mapping liability in blockchain smart grids (1)
Permissionless blockchain

How to qualify in legal terms interactions among nodes in the platform?

- Multilateral and open '*distributed ledger contract*'?
- Distributed form of (contractual) liability could be an effective solution for compensatory protection (*ex post* guarantee).
- ***Impermeability*** issues: how to intervene into self-enforcing smart contracts (*ex ante* guarantee).
- Is a radical decentralization in energy supply legally feasible/opportune?

Mapping liability in blockchain smart grids (2)
Permissioned blockchain

- Milder form of decentralization.

- Element of centralization (qualified nodes) allows to manage liability in case of dysfunctions.

- Distributed ledger contract including preselected subjects able to intervene in case of malfunctions, queries, complaints, or mistakes in smart contracts performance.

This solution puts **vulnerabilities back in the system**, but it ensures a **higher degree of legal enforcement**
(Annex I to Directive 2009/72/EC - Art. 10 Directive 2019 on common rules for the internal market for electricity entering into force on January 2021: key role of suppliers in order to ensure consumer protection).

Roles of market actors in an energy blockchain environment

	Traditional energy supply chain	Digital energy supply chain with blockchain
Production	Few industrial energy producers	Local production / prosumers add to power plants
Transmission	Transmission companies	Transmission companies (unchanged)
Distribution	Distribution companies	Distribution companies (unchanged)
Supply	**Energy companies**	**Blockchain systems supporting smart contracts**
Consumers	Passive role	Active role in managing consumption and emerging prosumerism

Final Remarks

- *Permissionless* systems: radical decentralization affects consumer protection: not a feasible solution for energy market.

- *Permissioned* systems: qualified nodes as parties of a *distributed ledger contract* and responsible to manage smart contracts (**reintroducing a form of authority**). Could ensure a trustworthy and legally compliant solution (in the light of Annex I to Directive 2009/72/EC – Art. 10 Directive 2019 on common rules for the internal market for electricity entering into force on January 2021).

- A possible practical solution: energy suppliers as qualified nodes in *permissioned* blockchain (*de facto* intermediaries): blockchain not disruptive of the business model, but technological opportunity for energy suppliers.

Thank you

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