

Challenges & risks of digitalization in the energy sector

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Disclaimer



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What do we understand by "digitalisation"? Before we start ...



autonomization

enertech

innovation

regtech

govtech

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scalability

flexibility

BigData

insurtech

suptech

Disruption

blockchain / DLT

computerisation

Machine Learning

¿ DIGITALISATION?

digital, i.e. non-analog, representation

churchtech

Al

digital control

optimisation

fintech

individualisation

automation

RPA

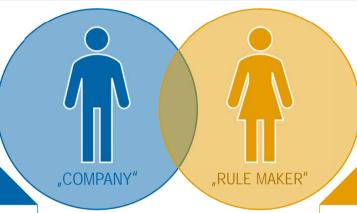
VR



How does digitalisation affect a regulator?

Digitalisation challenges regulatory authorities in all its roles





- Fulfil tasks and obligations as "company" (monitoring, report, etc. tasks);
- Efficiently reaching company goals requires more and more the use of new technologies (e.g. for data collection and processing);
- E-government, E-regulation, etc.

- Setup rules within legally defined boundaries (market and technical rules)
- Identify & understand innovative developments:
 - regulator must serve as informed sparring partner for the market;
 - regulator prepares future-oriented framework conditions.



Where do digitalisation & energy markets meet? Evolution & innovation along the whole energy value chain – amended by a new "digital"



dimension"

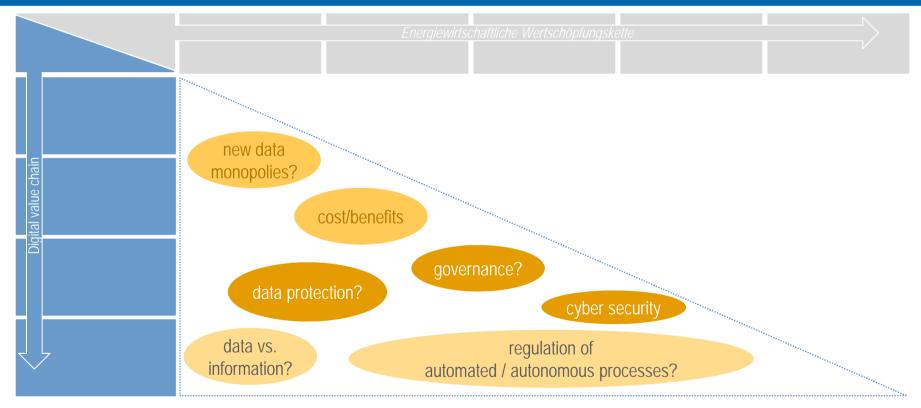
		Energy sector value chain				
		Production	Transport	Trading	Sales	CONSUMPTION
Digital value chain	INFRASTRUCTURE & SENSORS	 Financing of infrastructure (tokenization, sharing) Asset-monitoring and -ownerschip (M&A, registration, data evaluation) Optimisation of operations (predictive maintenance) 				> Smart meter(ing)
	PROCESSES & COMMUNICATION	> Transparency for market participants & regulators > Simplification of data exchange & matching between market roles (e.g. congestion management) > Processing of PPA		> Automation/autonomisati on > P2P trading > Backoffice (post trade)	> Switching process	> Metering and settlement of charges & levies > Technical realisation of "energy communities"
	DATA & ANALYTICS	> Wind park design > Improved gas/oil prod. (machine learning) > Digital Twins	> Decentralized smart grids > Flex markets	> Market surveillance / monitoring > Insider information > Price transparency	> Temporary access to customer data	> Energy management systems
	DIGITAL SERVICES & CUSTOMER VALUE	> Guarantees of origin > Regionality certifications		> Implementation of local markets > autonomisation	> Dynamic pricing (incl. DSR vouchers) > Flat rates > Pay-as-you-go models	> Pay as you go > Sharing of resources > Individualization/optimiza tion



Challenges for digitalisation in the energy sector



... arise from the primarily digital aspects thereof

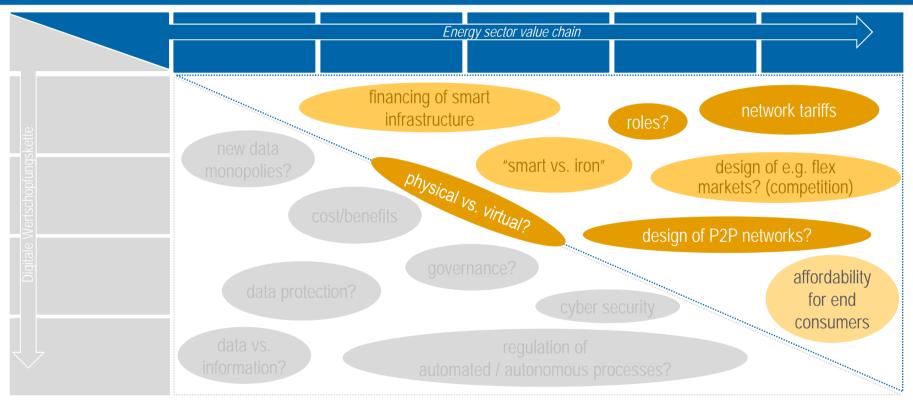




Challenges for digitalisation in the energy sector



... arise from "traditional" and technology-agnostic issues!





Challenges for regulators and policy makers ... key issues to be addressed in the future!



EFFICIENT INNOVATION MANAGEMENT OBSTRUCTIONS FOR ISSUE OR TECHNOLOGY? Identification of relevant tech • What is obstructed? The tech or the the underlying Dynamic and well-trained HR **DEVELOP SOLUTIONS TO FUNDAMENTAL** SPEED UP REGULATORY DECISIONS KEY ISSUES Decision processes in an increasingly dynamic setting required Generation, storage of and access to data **ISSUES** Danger of late reaction A FIRST STEP FUTURE-ORIENTED DECISIONS AND FRAMEWORKS INTERDEPENDENCIES WITH OTHER SECTORS 皿 "CEER public consultation on Abide by regulatory principles finance Digitalisation in the Energy Sector Technology neutral Business model neutral internal data market



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