

Blockchain Technologies in the Energy System

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On behalf of the EDA Project

What Type of Blockchain?

1. **Crypto Currencies**
 - Good: transfer and storage of value (Bitcoin, Dash, Zcash, ...)
 - Bad: any other application
2. **Smart Contracts**
 - Good: Crowdfunding, Co-Finance, ICOs (Ethereum)
 - Bad: performance, any program logic beyond ICOs
3. **Blockchains for B2B Integration**
 - Good: Communication, data storage, integrity, consensus (HyperLedger, Tendermint, BigChainDB, ...)
 - Bad: low level of application support
4. **IoT Blockchains**
 - Good: Connect a huge numbers of devices, less consensus, less integrity (IOTA, ...)
 - Bad: only available for a few months

Gridchain - Austria

Gridchain

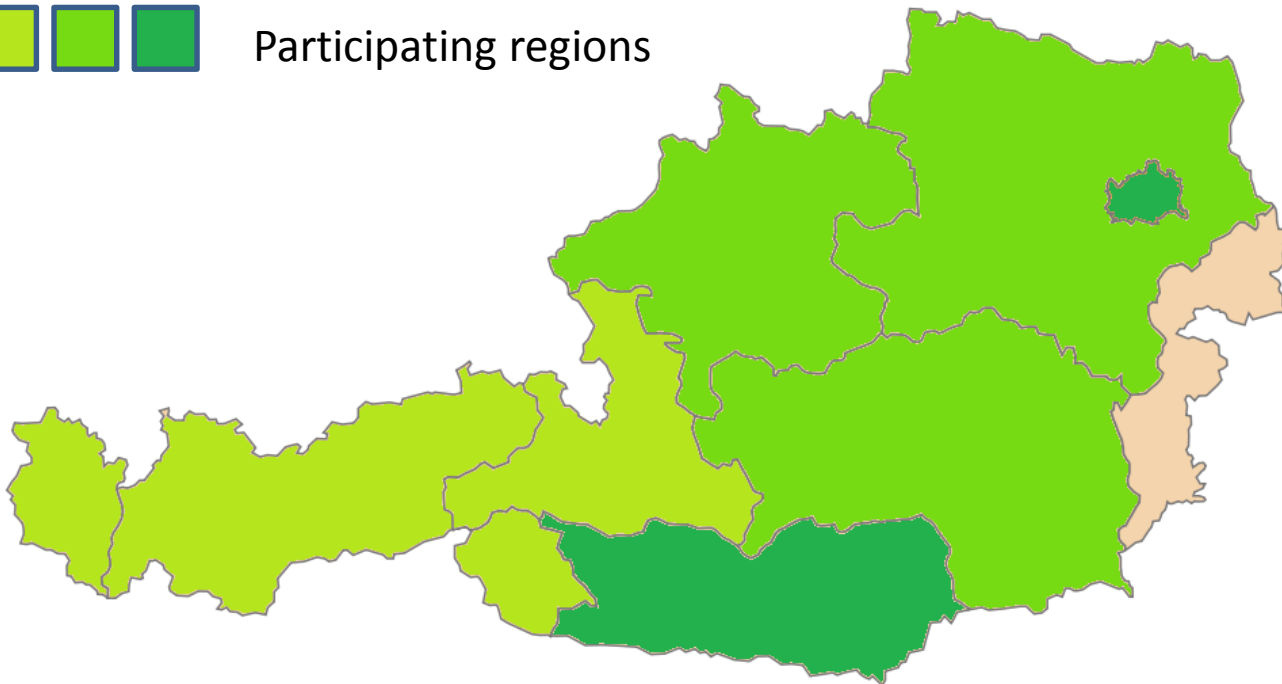
- DSO / TSO Harmonisation
- Balancing Process
- Congestion Management

Ein Projekt in Österreich zeigt, dass die Blockchain auch im Netzmanagement erheblichen Nutzen stiften kann. Nun sollen die Potentiale für deutsche Netzbetreiber ausgelotet werden.

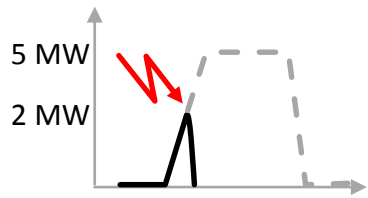
3

A graphic for the Gridchain project. It features a teal background with a network of white lines and dots. In the center, there's a semi-transparent grey box containing the title 'Gridchain' and a bulleted list of three items: 'DSO / TSO Harmonisation', 'Balancing Process', and 'Congestion Management'. To the right of the box, there's a paragraph of German text. Below the text, there are three circular icons: a power plant, two wind turbines, and a solar panel. A large number '3' is positioned to the right of the icons.

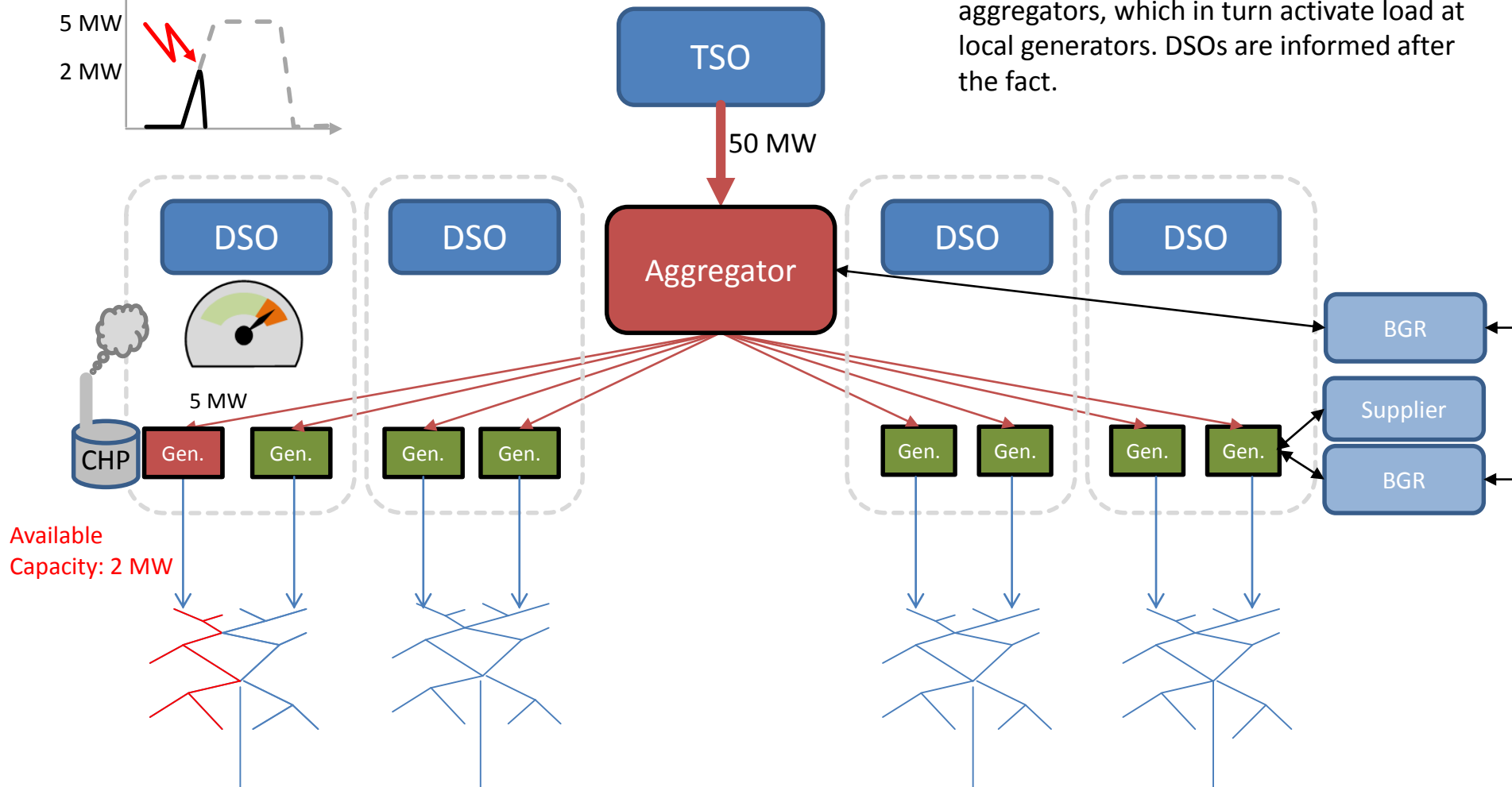
Participating regions



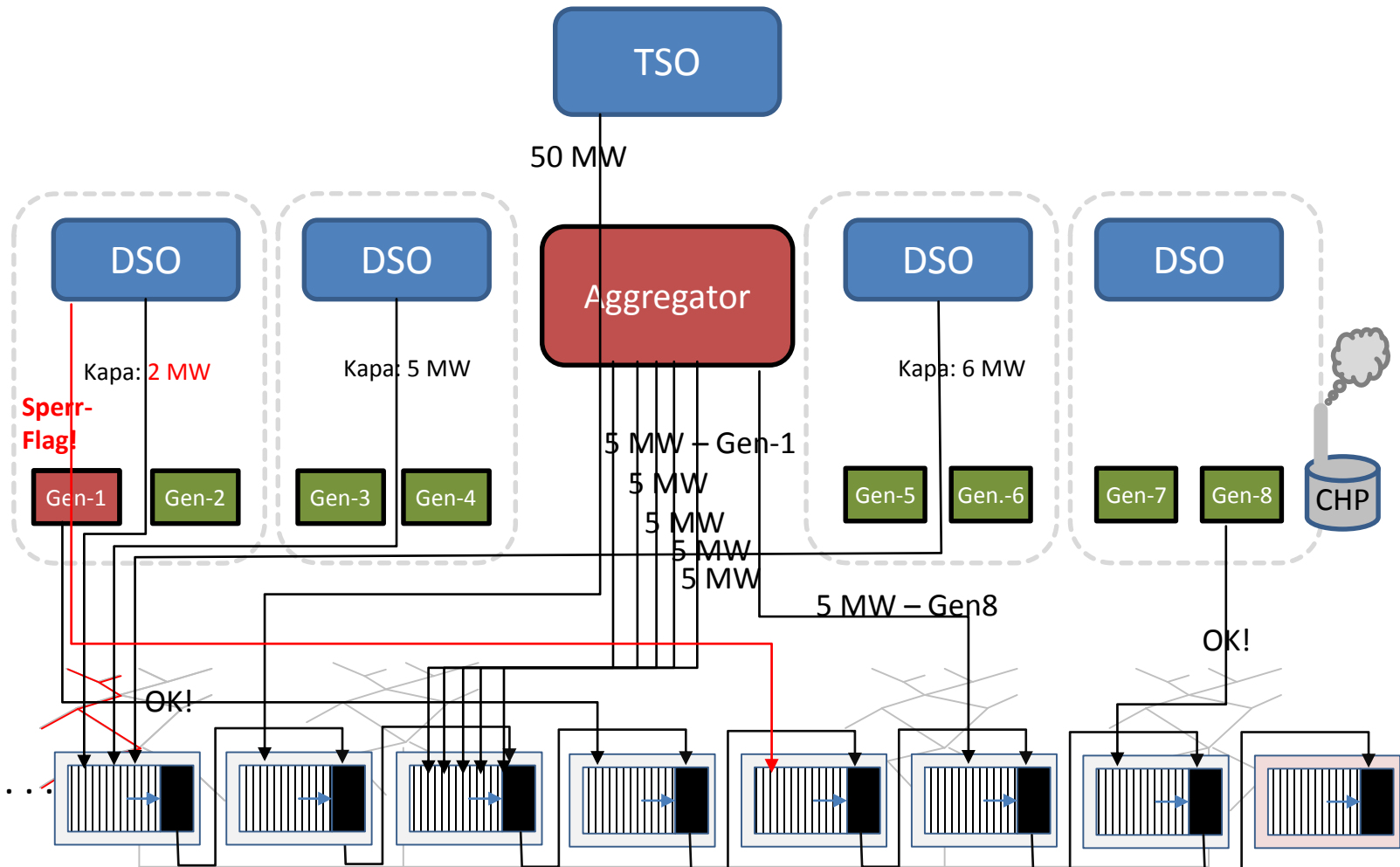
GridChain – TSO / DSO Process Synchronisation



TSO requests balancing power from aggregators, which in turn activate load at local generators. DSOs are informed after the fact.

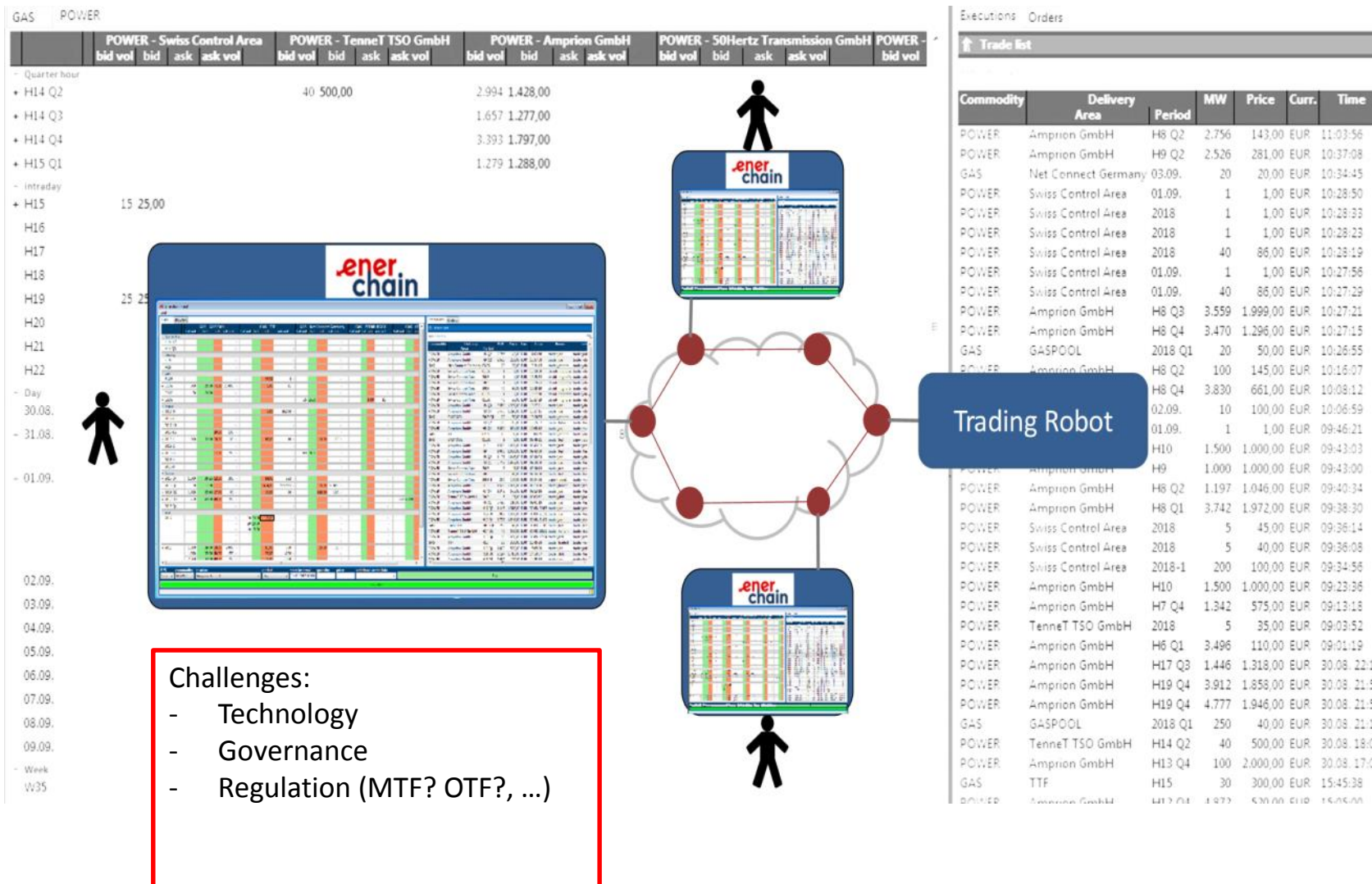


GridChain – TSO / DSO Process Synchronisation with Blockchain



The Enerchain Project

„The world's first commodity trading platform over the blockchain“



Enerchain – 43 Participants

			
			
			
			
			
			
			
			
			
			4 Logos not shown
			

„Enerchain is probably the most innovative project in the world of energy“

Ernesto Ciorra, Head of Innovation, ENEL

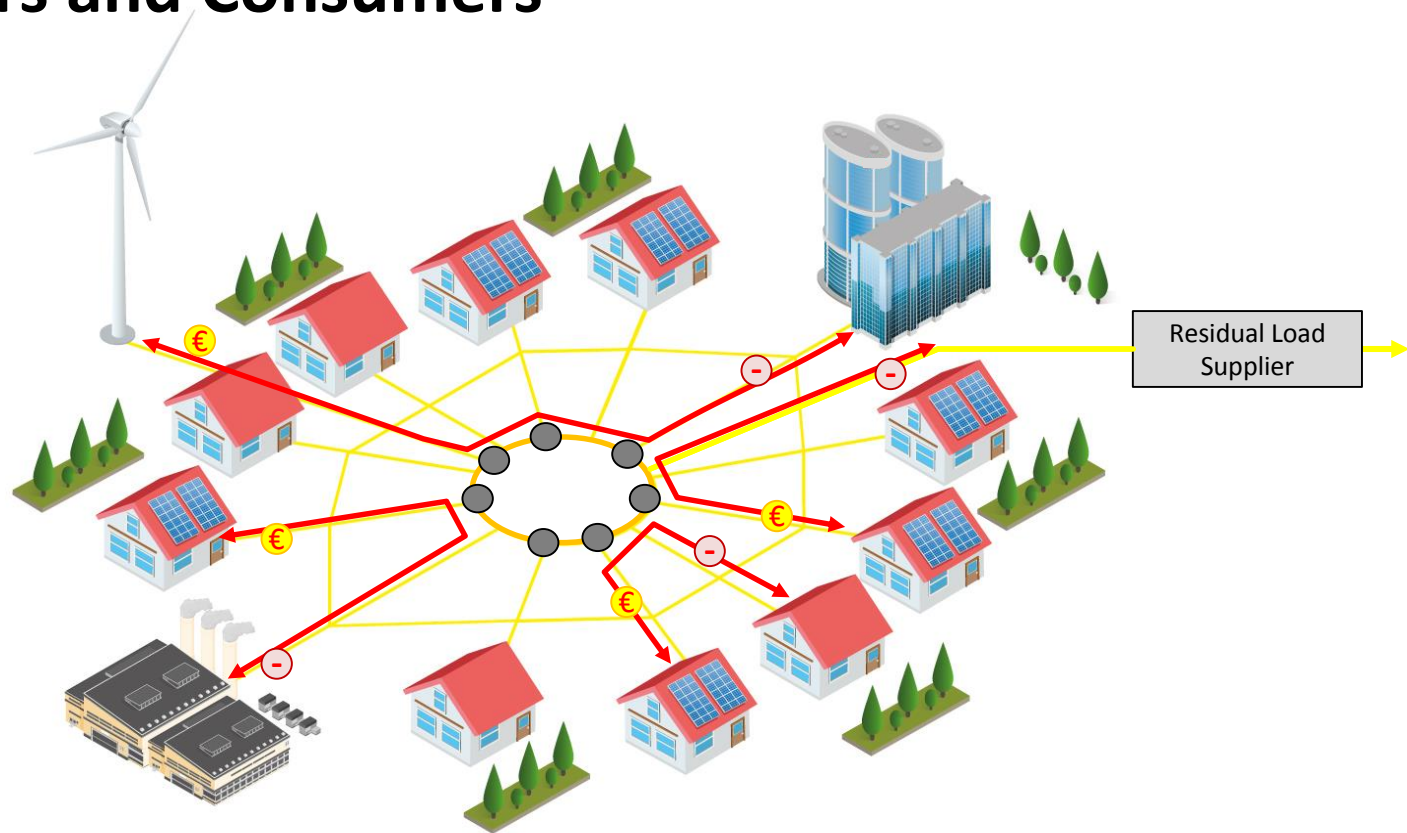
„Der Großhandel von Strom und Gas bietet einen klaren Anwendungsfall, um konkrete, praktische Erfahrungen mit dieser Technologie zu sammeln“

Kilian Leykam, Vattenfall

“The possibilities with the Enerchain are endless: over-the-counter trading, balance group management, wholesale trading and much more.

Solarplaza Guide to Companies involved in Blockchain & Energy

P2P Trading between Prosumers and Consumers



- Challenges:
 - GDPR / Data protection
 - Energy Law (EnBW, ...)
 - Business model

Thank you!

More Information on Enerchain & Gridchain: <http://enerchain.ponton.de>

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NEW 4.0
Norddeutsche EnergieWende



<http://enerchain.ponton.de/index.php/3-applying-the-blockchain-to-energy-trading>

Potential of the Blockchain Technology in Energy Trading

Appears as a book chapter in: Daniel Burgwinkel et al.: "Blockchain technology Introduction for business and IT managers", de Gruyter, 2016

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References

Global Account AG – REGISTER / Search

LOT SEARCH
For a list of lots within a defined period of time

Search
Manage Lots
Allocation
Release

Producer (contracted by DSO)
☐ ALL
☐ Producer 1
☐ Producer 2
☐ Producer 3
☐ -

DSO (used by Register)
☐ ALL
☐ DSO 1
☐ DSO 2
☐ DSO 3
☐ -

Grid injection period
☐ Transaction date
 Start: 2017-09-01 10:00
 End: 2017-09-02 10:00
 SEARCH

SEARCH RESULTS

Lot-ID	Status	Date	Producer	Meter-ID	DSO	Grid injection period	Grid injection	Grid injection	Total kWh	Register
7070013343	allocated	13.04.2017	Wip-Achterhoek	NL00****0222	Gasunie	13.03.2017	18.04.2017	3.355	Vertogas	
7070700422	released	13.04.2017	Indaver Compost B	NL00****0817	Gasunie	13.03.2017	12.04.2017	4.312	Vertogas	
6800300881	new	16.04.2017	Rijnschoude	NL00****1558	Gasunie	16.03.2017	15.04.2017	799	Vertogas	
6840409724	allocated	12.04.2017	N.V. HVC Middelmeer	NL00****0566	Gasunie	12.03.2017	11.04.2017	8.218	Vertogas	
6739047346	new	08.07.2016	Biomethanisation M	NL00****0527	Gasunie	08.07.2016	07.07.2016	1.000	Vertogas	
6694676266	new	15.04.2017	Tilburg	NL00****0254	Gasunie	15.03.2017	14.04.2017	1.400	Vertogas	
6587050462	allocated	11.04.2017	Biomethanisation M	NL00****0527	Gasunie	11.03.2017	10.04.2017	950	Vertogas	
6534770539	released	06.05.2016	Biomethanisation M	NL00****0527	Gasunie	06.04.2016	05.05.2016	1.000	Vertogas	
5860446481	new	05.03.2017	Biomethanisation M	NL00****0527	Gasunie	05.03.2017	04.03.2017	1.000	Vertogas	
5390446793	burned	05.11.2016	Biomethanisation M	NL00****0527	Gasunie	13.07.2016	04.11.2016	1.000	Vertogas	
4808754312	burned	05.04.2017	Rijpsel Fries VOF	NL00****0111	Gasunie	05.03.2017	04.04.2017	2.400	Vertogas	
4852971059	allocated	04.04.2017	to Green Energy	NL00****0070	Gasunie	04.03.2017	03.04.2017	1.400	Vertogas	
3963300611	released	17.04.2017	Wierdt	NL00****0326	Gasunie	17.03.2017	16.04.2017	1.000	Vertogas	
3388889373	new	04.03.2017	Biomethanisation M	NL00****0527	Gasunie	03.03.2017	02.03.2017	1.000	Vertogas	

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Sustainability Certification in the Food Supply Chain

