Flexibility markets: Q&A with project pioneers

Tim Schittekatte

FSR Innovation Bootcamp 28 November 2019

Different ways for DSOs to access flexibility

Distribution Systems Working Group

Flexibility Use at Distribution Level

A CEER Conclusions Paper

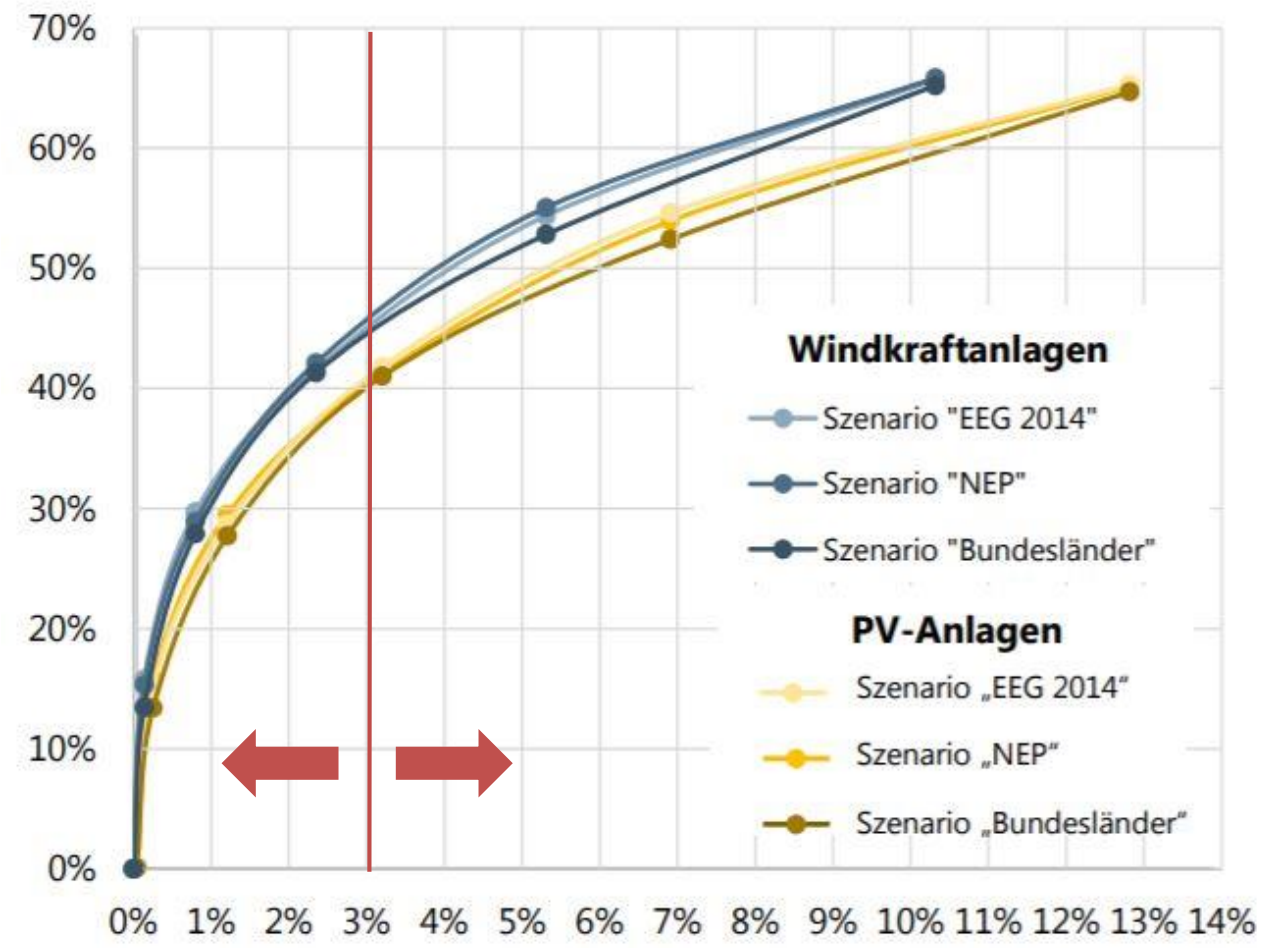
- **Rules-Based Approach** – codes and rules, which impose detailed flexibility requirements.
- **Network Tariffs** – tariff structures may be designed to encourage network users to alter their behaviour for a more efficient use of the distribution network.
- **Connection Agreements** – DSOs could reach arrangements with customers for the provision of flexibility where a Member State considers this an appropriate measure.
- **Market-Based Procurement** – DSOs can explicitly procure flexibility that benefits the grid services from the market(s). The flexibility could be procured via (bilateral) contracts or in a short-term market, e.g. via a platform or other forms of interfaces, given there is enough liquidity and arrangements for the market-based procurement do not unduly distort markets and comply with unbundling rules.

In examining these different models, CEER agrees with many respondents that market-based procurement is the preferred option because the procurement of flexibility on a competitive basis would be efficient as long as markets for the provision of flexibility that benefit the network are liquid and comply with unbundling rules. Clear requirements for the bilateral contracts need

Illustration of a use case of flexibility markets

Save 40% investment with 3% curtailment

Ratio of saving network expansion



Ratio of curtailment volume

Forschungsprojekt Nr. 44/12

„Moderne Verteilernetze für Deutschland"
(Verteilernetzstudie)

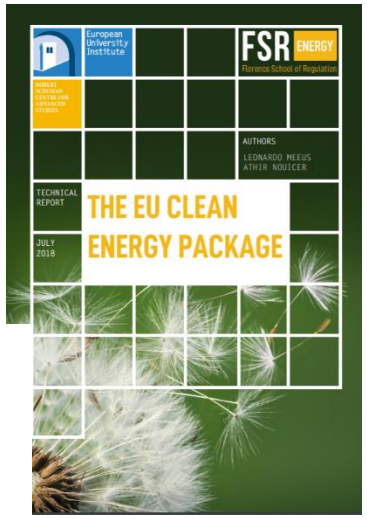
Abschlussbericht

Studie im Auftrag des Bundesministeriums für Wirtschaft und Energie (BMWi)

12. September 2014

E-Bridge IAEW OFFIS

New players in new markets



2.3.2. Measure to incentivize DSOs to procure flexibility services

The CEP aims to define the conditions under which DSOs may acquire flexibility services[47] without distorting the markets for such services. It includes clear provisions that will enable DSOs to manage local grid issues and enhance the security of supply (SoS) through flexibility procurement.

DSOs flexibility services procurement process

Regarding the regulatory framework for the procurement of flexibility by distribution system operators, **art 32(1)** of the E-Directive requires MSs to define the exact regulatory framework including incentives for DSOs and adequate remuneration. It states that *'Member States shall provide the necessary regulatory framework to allow and incentivise distribution system operators to procure flexibility services services, including congestion management in their service area, in order to improve efficiencies in the operation and development of the distribution system.'*

This procurement shall be transparent, non-discriminatory and market-based. In this context, market-based flexibility procurement refers to a process whereby flexibility is obtained and priced through a (separate) market mechanism from all stakeholders that are a source of flexibility, benefit from it, or have a controlling role, i.e. consumers, producers, BRP, system operators and regulators. In addition, the non-discriminatory aspect refers to the *'participation of all market participants including renewable energy sources, demand response, energy storage facilities and market participants engaged in aggregation,'* as stated in **art 32(1a)**. A derogation could be given by NRAs, if they establish that this kind of procurement is not economically efficient or if it may cause severe market distortions or higher congestions.

Local flexibility markets

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Tim Schittekatte[a,b] and Leonardo Meeus[a,b]

piclo Flex

UK Power Networks – Delivering your electricity

Scottish & Southern Electricity Networks

SP ENERGY NETWORKS

NORTHERN POWERGRID

electricity north west

WESTERN POWER DISTRIBUTION – Serving the South West and Wales

enera

epexspot

EWE netz

TenneT – Taking power further

avacon

GOPACS

ETPA – Energy Trading Platform

Liander

Westland energy solutions

TenneT – Taking power further

ENEXIS GROEP

STEDIN

NODES

NORD POOL

agder energi

Some early stats

	Piclo Flex	Enera	GOPACS	NODES
Data	*1st tender (cleared-15/05/2019), flexibility procured by UKPN*	*Status in September 2019 based on interview*	*Status in September 2019 based on interview*	*Status Norway pilot in September 2019 based on interview. This pilot will be extended in 2020.*
Time-frame	Months ahead	Intraday	Intraday	Pilot: Intraday Extended: Intraday and closer to real-time (only for TSO)
Market clearing	Auction	Continuous trading	Continuous trading	Continuous trading
Price zones	**28 constraint areas (contracts awarded in 7 areas)**	**23 local order books, expanded from 11 in September 2019**	**No static zones, dynamic dependent on congestion needs**	**Pilot: 1 zone Extended: order of 7-13 dynamic zones**
Voltage level flexible units (currently)	**11 kV or lower**	**20 kV or lower**	**110kV or higher, soon also 50 kV or lower**	**Pilot: 22kV or lower Extended: 132kV or lower**
# flexibility providers	**6 successful (19 prequalified, 15 bid)**	**6**	**5-10**	**Pilot: 1 Extended: 5**
Indication of the magnitude of the available flexibility	**18.1 MW contracted flexibility on 94.8 MW demand**	**First trade was 2 MWh, 50 + transactions between feb-oct/'19**	**10-100MWh per trade**	**Extended: projection of ±10 MW available flexibility**

Relevant learning for the session (1/2)

- The market operator in the four pioneering projects are third-parties.

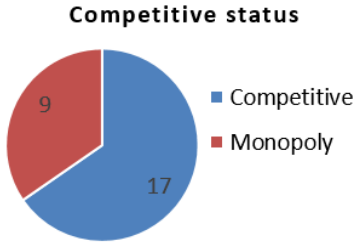
- Different solutions compete for the market. This is beneficial for innovation as they all try to implement their own solutions and as such we can learn by doing.

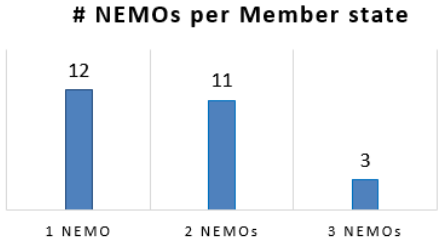
- Anyhow, the market operator role is a point of controversy. Who should be it and directly related, competition vs monopoly?

Relevant learning for the session (2/2)

- It is unclear whether in the future it would be beneficial to see different flexibility platforms compete in the same region. Anyhow, the monopolistic task of market clearing would in any case have to be carried out under cooperation.

Which market?	Market operator EU	Market operator US – e.g PJM
Forward energy	Competitive PXs	Competitive PXs
Forward transmission capacity	Monopolistic service company owned by TSOs	Monopolistic RTO/ISO (very little need for redispatch due to nodal pricing)
Spot markets	Competitive or monopolistic PXs	
Redispatch	Monopolistic TSO or cost-based or jointly done with balancing	
(National) Balancing	Monopolistic TSO (possibly third-party settlement company)	





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Six key dimensions

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	YES	NO	
1. Is the flexibility market integrated in the existing sequence of electricity markets?	GOPACS and NODES	Piclo Flex and Enera	Difference
2. Is the flexibility market operator a third party?	All projects. GOPACS is not a market platform operator but an intermediary. Currently, the market platform is ETPA.	/	Trend
3. Is there a reservation payment?	Piclo Flex	Enera, GOPACS and NODES (all projects envision to integrate reservations)	Difference
4. Are products standardized in the flexibility market?	Piclo Flex, Enera and GOPACS (IDCONS)	NODES	Difference
5. Is there TSO-DSO cooperation for the organization of the flexibility market?	GOPACS (TSO and DSOs use the same intermediary). Enera and NODES (soon the TSO will be active on the same platform)	Piclo is solely a DSO platform	Difference
6. Is there DSO-DSO cooperation for the organization of the flexibility market?	Piclo Flex (6 DSOs), GOPACS (4 DSOs), Enera and NODES (one DSO per installation but soon more will join)	/	Trend