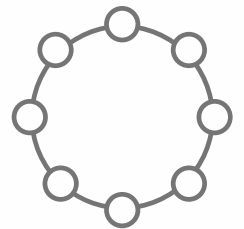


Aggregators

The Wide Scope of Services

27 September 2016



NEXT KRAFTWERKE

... a Digital Utility

Next Kraftwerke operates a large Virtual power plant and is certified electricity trader on different markets in Europe (FR, DE, AT etc.).

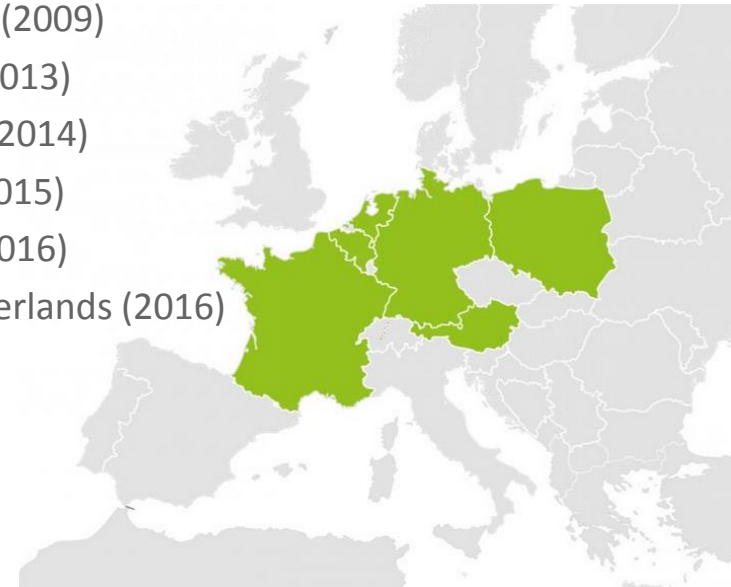
The concept of the virtual power plant is based on the idea to couple small and decentralized generation to make them work together as a large power plant.

NEXT KRAFTWERKE

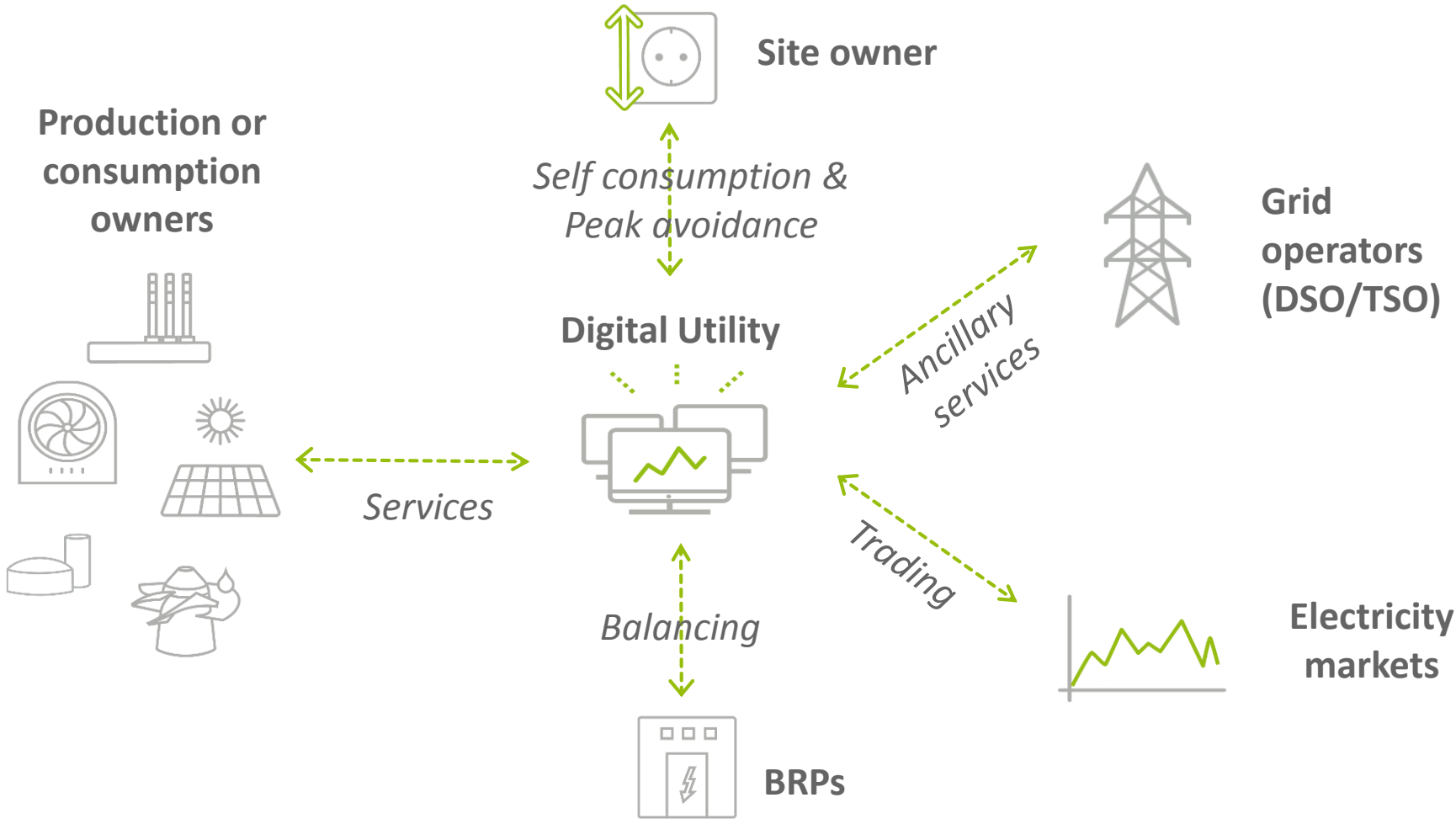
- > Founded in 2009
- > Valorizing flexibility on all markets
- > Reserve power and electricity markets
- > One of the largest VPPs in Europe
- > > 3600 units connected
- > > 2 GW in the Next pool
- > 125 co-workers

Active in the following countries

- > Germany (2009)
- > Austria (2013)
- > Belgium (2014)
- > France (2015)
- > Poland (2016)
- > The Netherlands (2016)



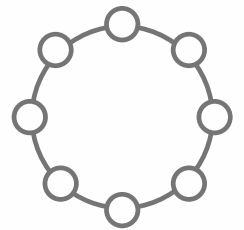
Services of an Aggregator?



What is an Aggregator?

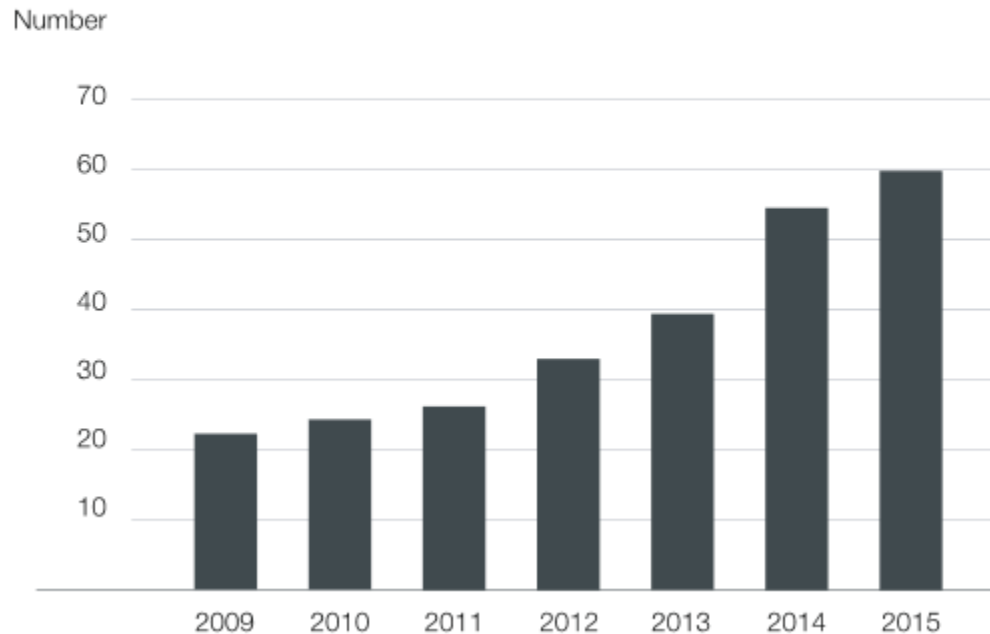
- > What?
 - > **Enhancement of flexibility use** at small and medium sized clients
 - > Giving **market access** to the flexibility and power markets.
- > How?
 - > By **aggregation** to meet requirements as bid size, availability etc. set for reserve power and electricity markets.
 - > By **cost-efficient ICT and control software** to allow connection of small plants.
 - > **Knowledge transfer**: Explain products and provide market knowledge.

Benefits of Aggregators?



Significantly more Providers for Reserve Power

NUMBER OF SUPPLIERS OF BALANCING CAPACITY IN GERMANY



Source:  50hertz

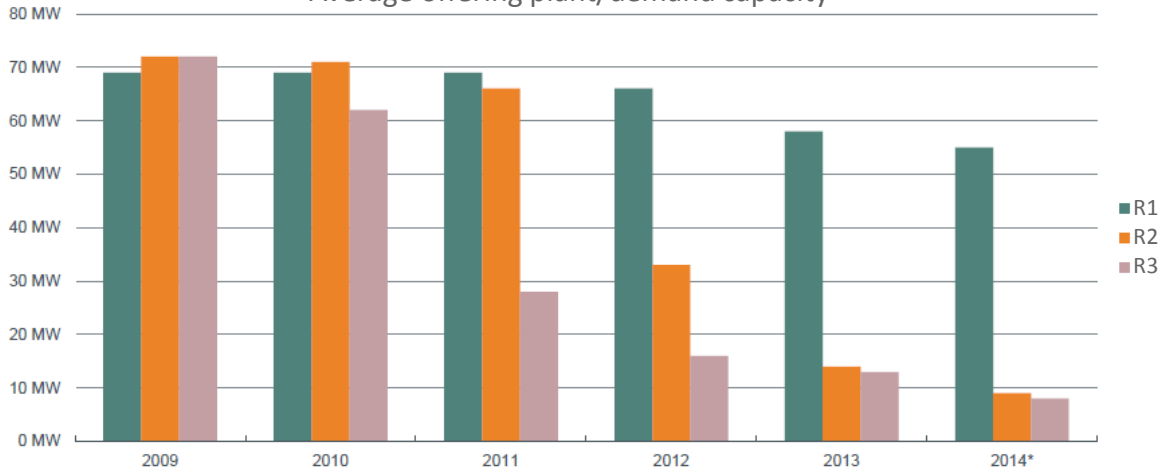


Sinds aggregation was allowed the number of providers for reserve power in Germany has increased by a factor 3.

More VPPs and Smaller Installations

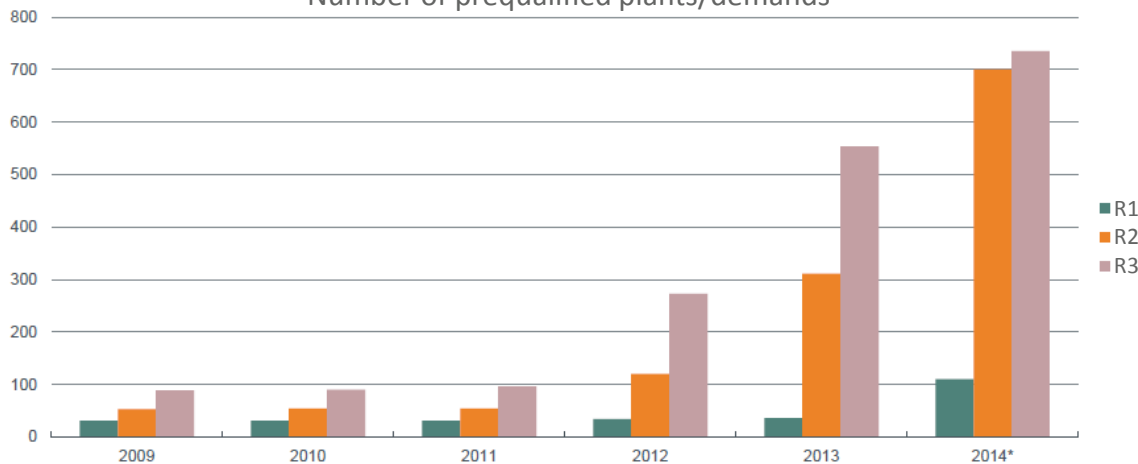
50Hertz Balancing Zone

Average offering plant/demand capacity



Average size of plants in pools for secondary and tertiary reserve power reduced from 70MW to 10 MW.

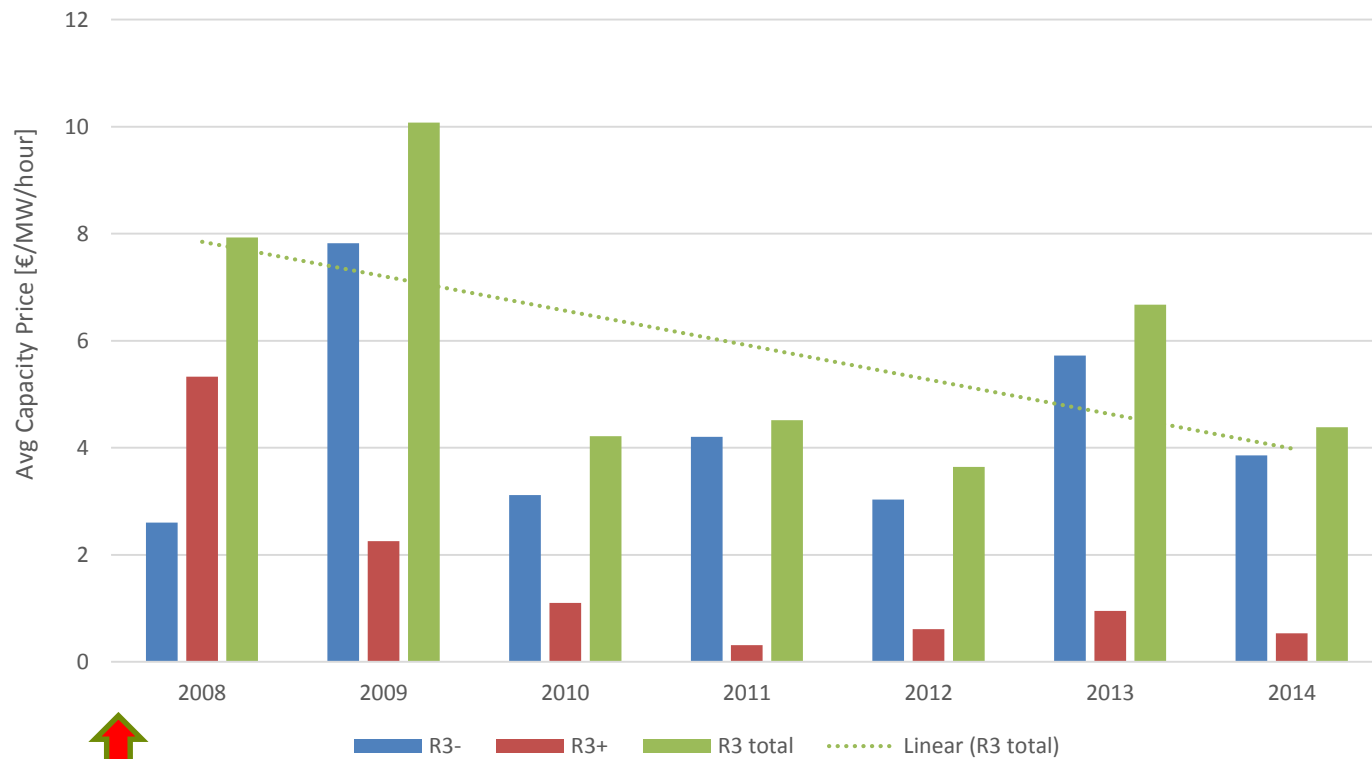
Number of prequalified plants/demands



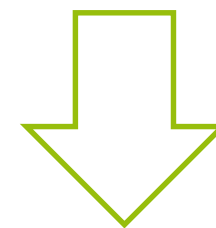
Number of prequalified plants increased largely.

Source: 

R3 - reserve power prices



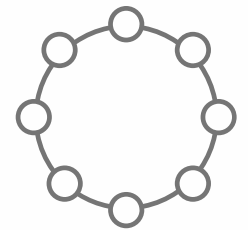
First new VPP entrant in 2007



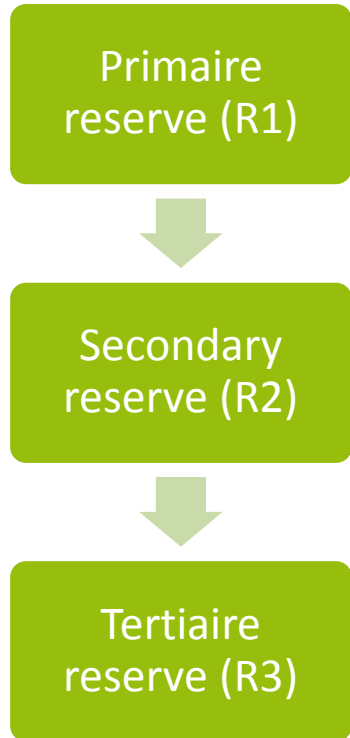
2016:

- R3- : ~0€/MW/h
- R3+ : ~0€/MW/h

Service I – Reserve Power – Examples



Reserve Power Provision - Belgium



Primaire
reserve (R1)

Provision in 0 tot 30 s
'positive' & 'negative'

- Nuclear power plants
- CCGTs
- Large consumers
- Since recently: DSO level installations

Secondary
reserve (R2)

Response within 30 s, provision
in 7,5 min
'positive' & 'negative'

- CCGTs

Tertiaire
reserve (R3)

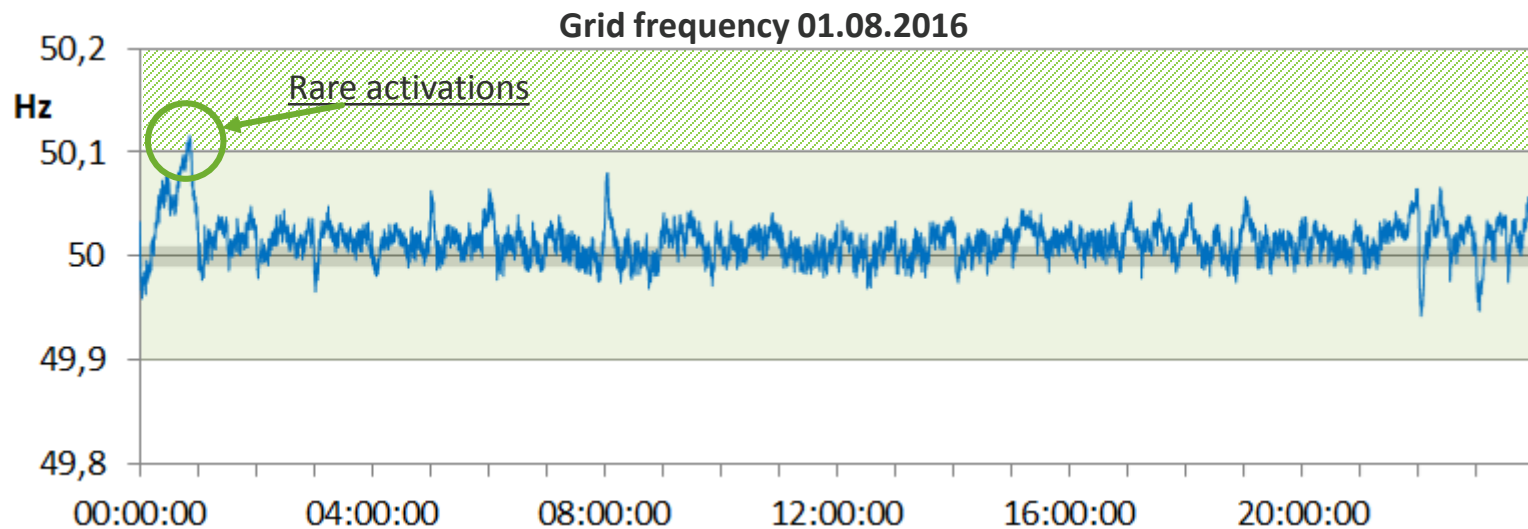
Levering vanaf 15 min
Enkel 'opwaarts'

- CCGTs
- Emergency generation
- Demand response
- CHPs

Next Pool Belgium

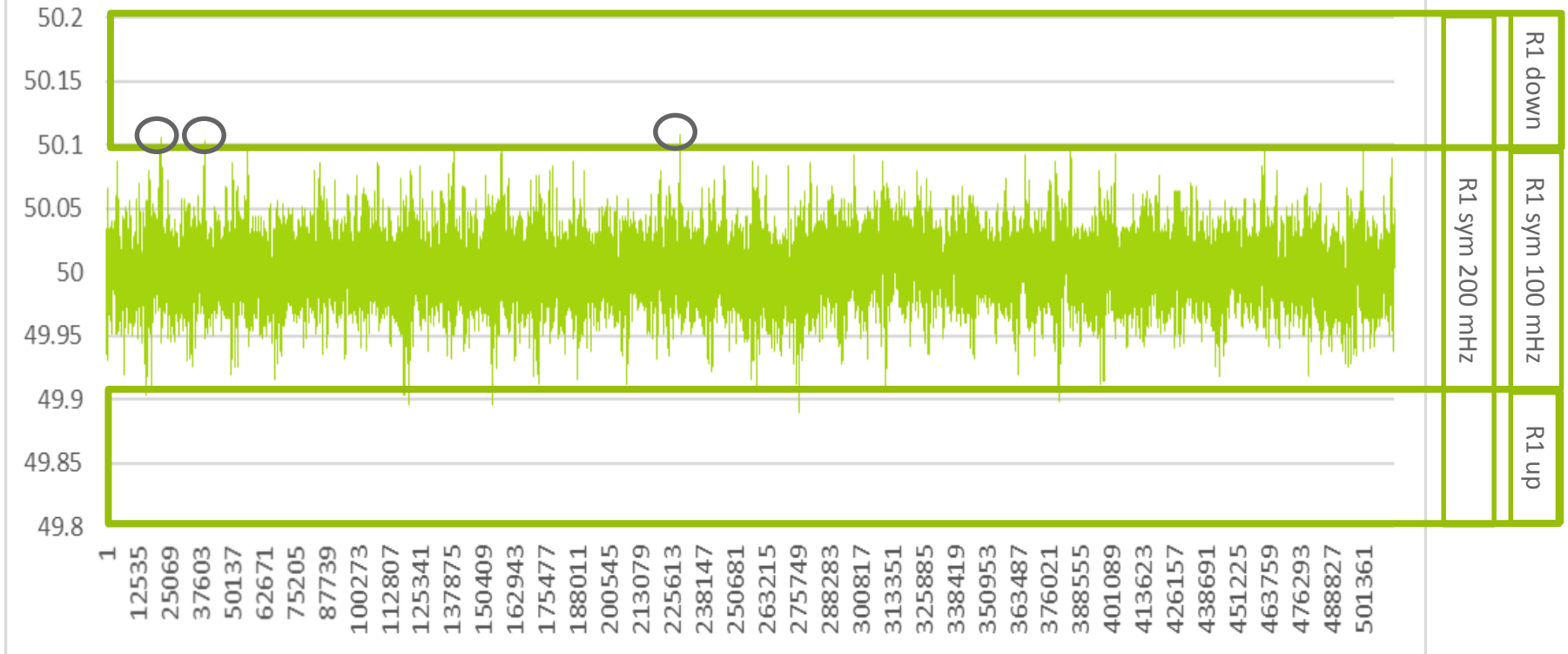
Primary Reserve in Belgium in Belgium

- › Since July Next Pool for R1 in Belgium
- › Starting with monthly tenders, today weekly tenders
- › Started with niche R1 product: frequency range 50,1 – 50,2 Hz (only negative)

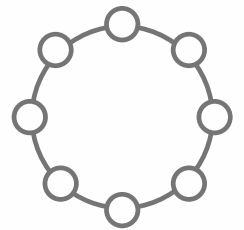


R1: Primaire reserve

System frequency (April 2014)



Service II – Trading – Examples



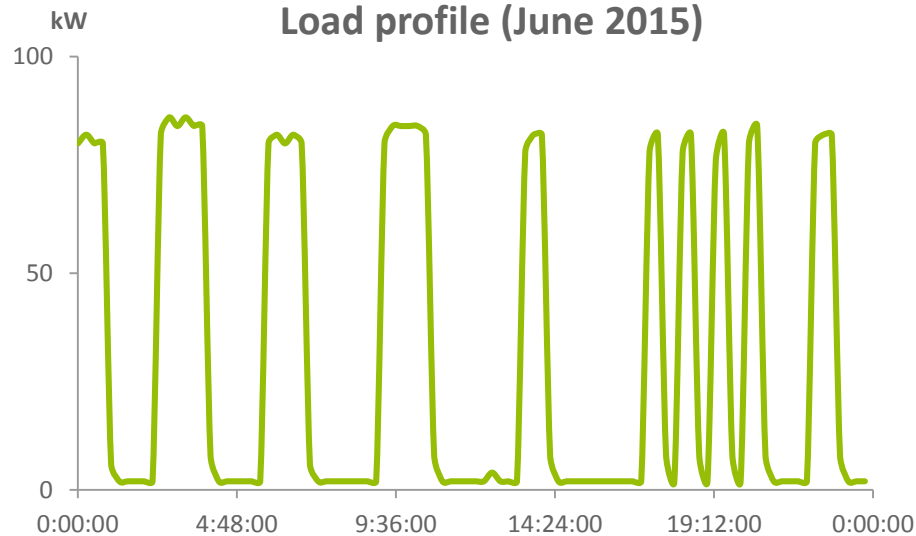
Trading on Electricity Markets

Case Study: Embankment Water Pumps

- Deich- und Hauptsielverband Dithmarschen (Photo: Matthias Reimers)
- Capacity of 3 pumps: 576 kW
- Power consumption: 645 MWh p.a.
- Product: Best of 96



Load profile (June 2015)



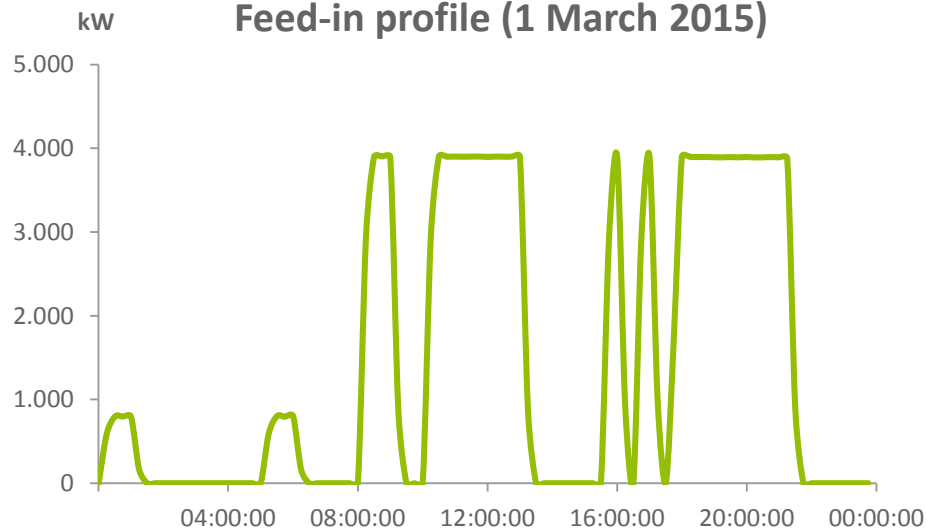
Trading and Reserve Power

Case Study: Flexible Biogas

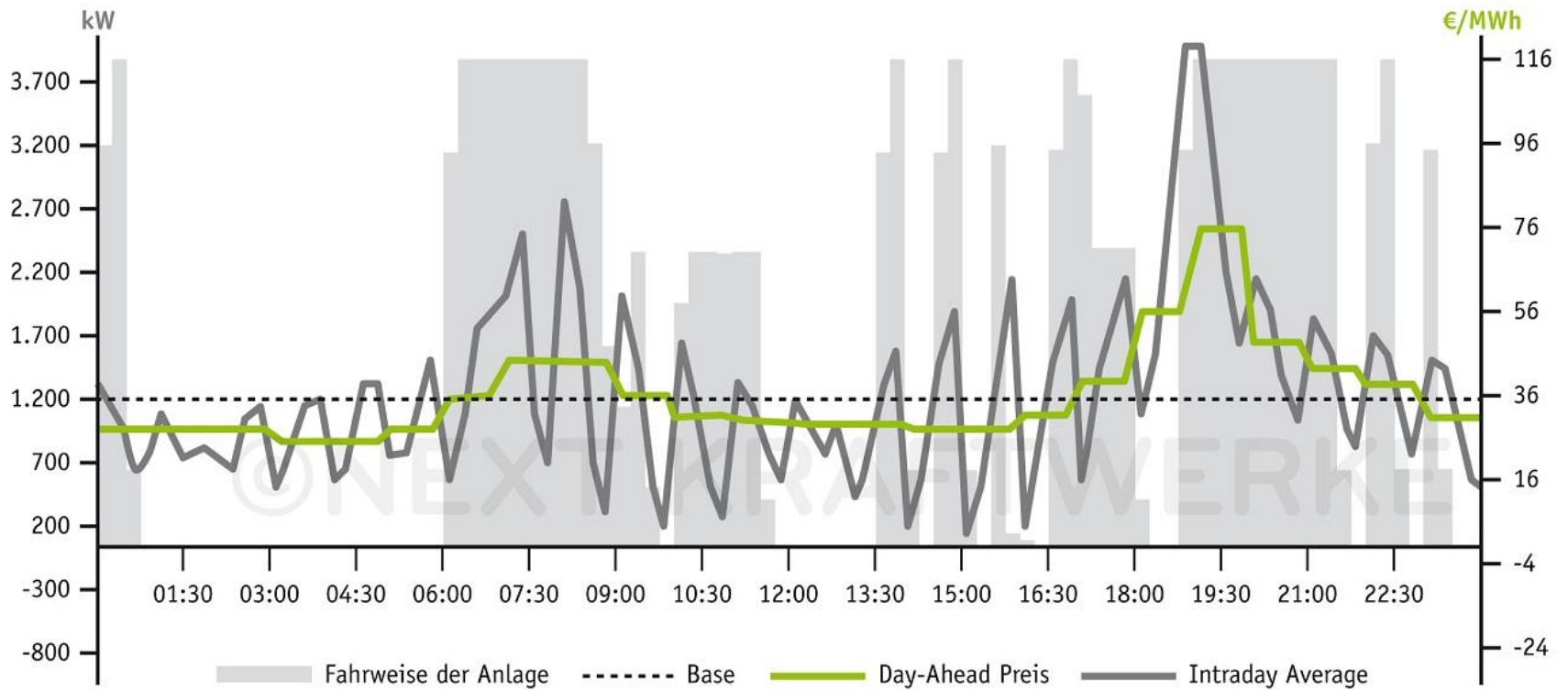
- Biogas installation Ahe (Photo: Onno Wilberts and Guido Koch)
- Capacity: 1,560; 1,560 and 800 kW
- Rated output: 1,172 kW
- Products: Direct Marketing, Demand-oriented feed-in, Control Reserve (+/-)



Feed-in profile (1 March 2015)



Biogas installation Ahe – Closer look





Thank you!

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