

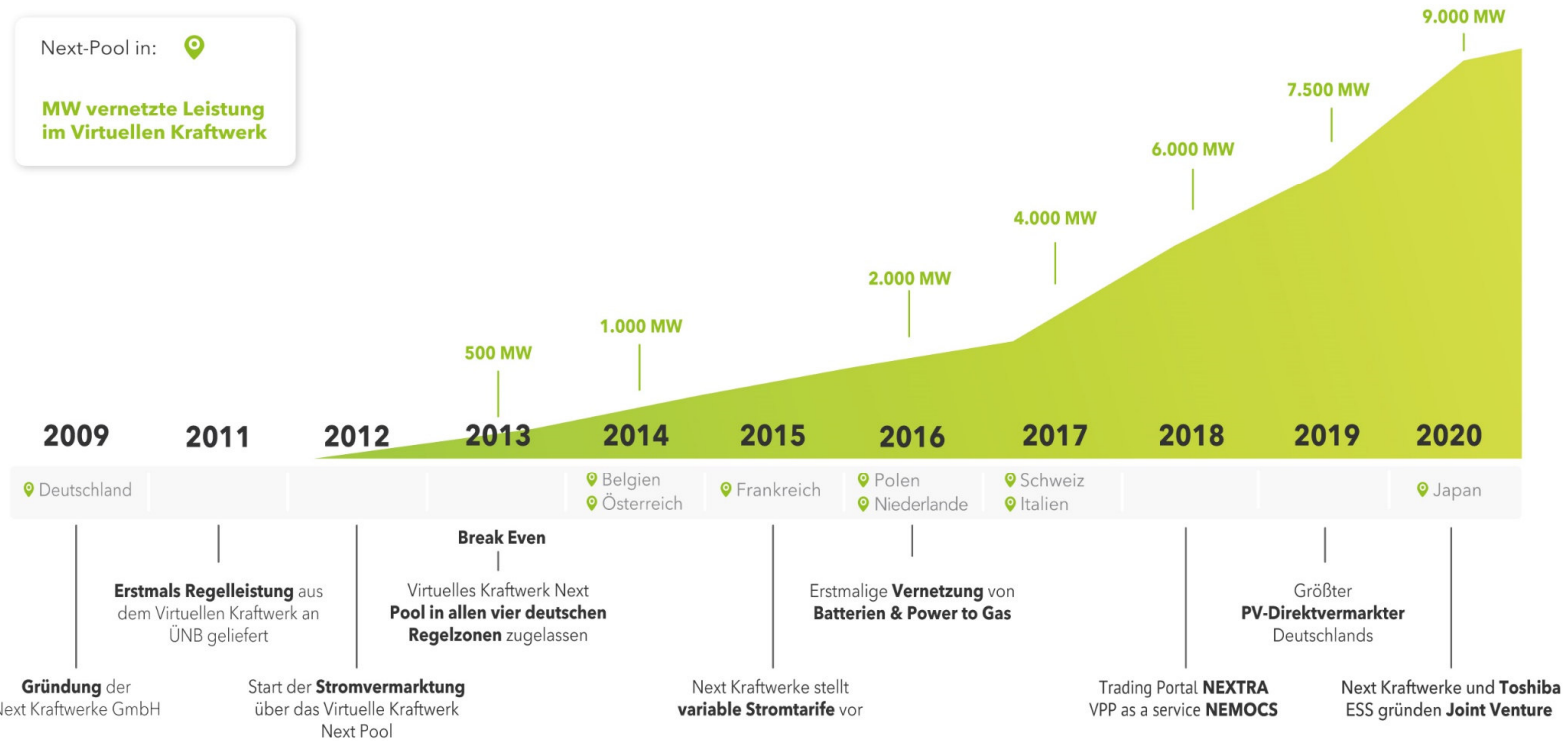
Neue Geschäftsfelder: Aggregatoren und Digitalisierung

Next Kraftwerke
Jochen Schwill



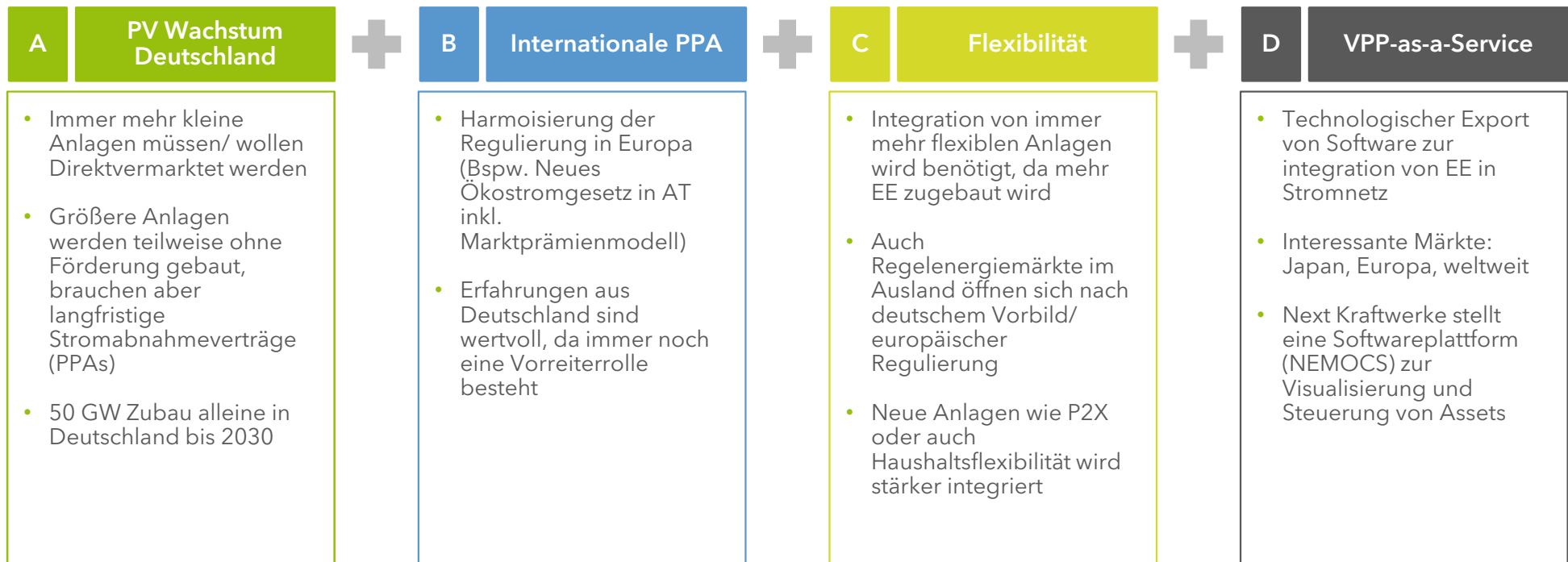
Milestones

Unternehmensgeschichte



Wachstumsmärkte

Aus der Perspektive eines deutschen Aggregators

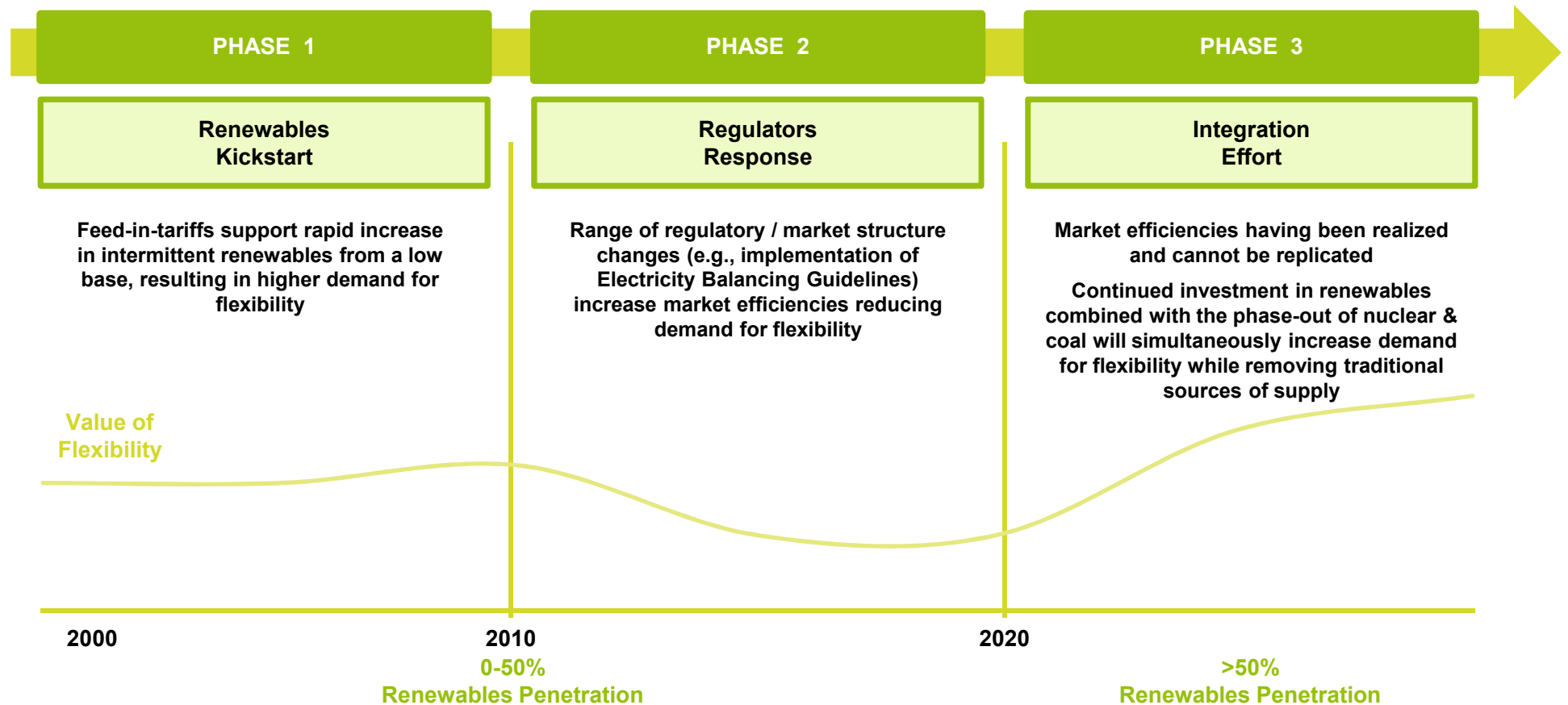


In der Transformation bieten sich viele Chancen für Marktteilnehmer neue Geschäftsfelder aufzubauen



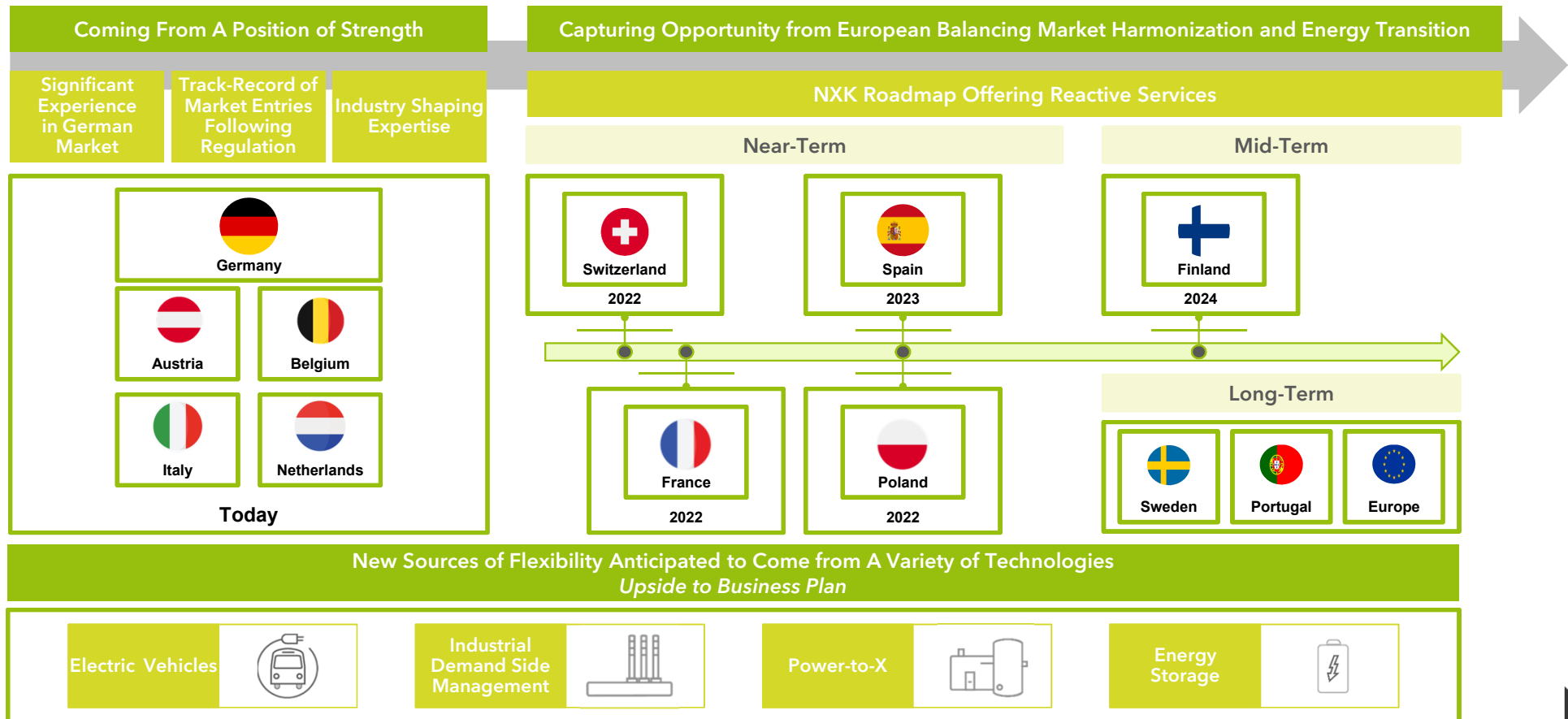
Implications for Balancing Energy Markets & Grid Operators

A case study in market design and supply / demand economics: Germany



Clearly Identified Opportunities for Growth

Reactive



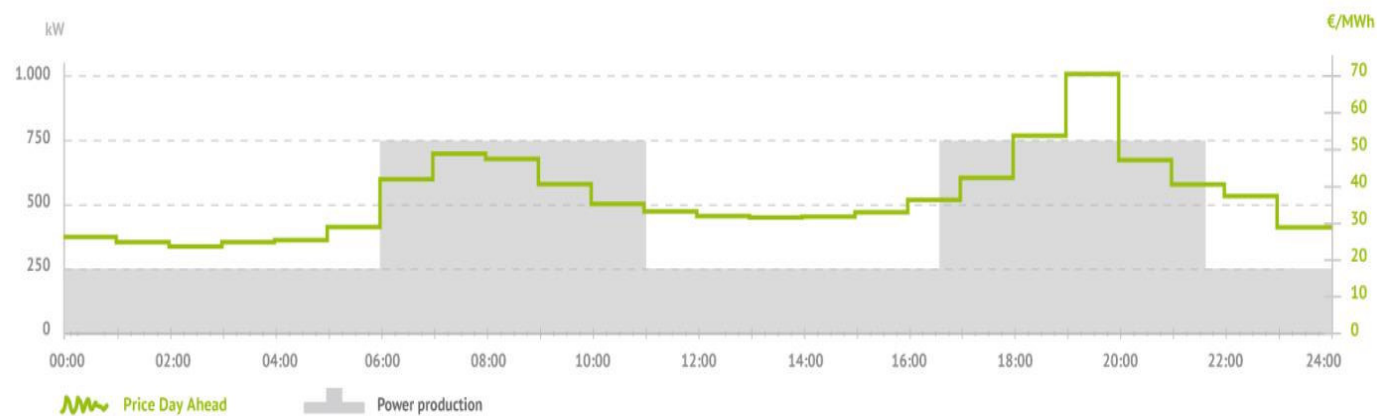
Dispatching of distributed generation

Controlling of decentral assets through price based schedules

Through the NEMOCS Control Center, or via an API, your connected assets can be dispatched and controlled in real-time

Your Benefits

Allowing for higher revenue by trading your dispatchable generation & flexible demand based on wholesale market prices

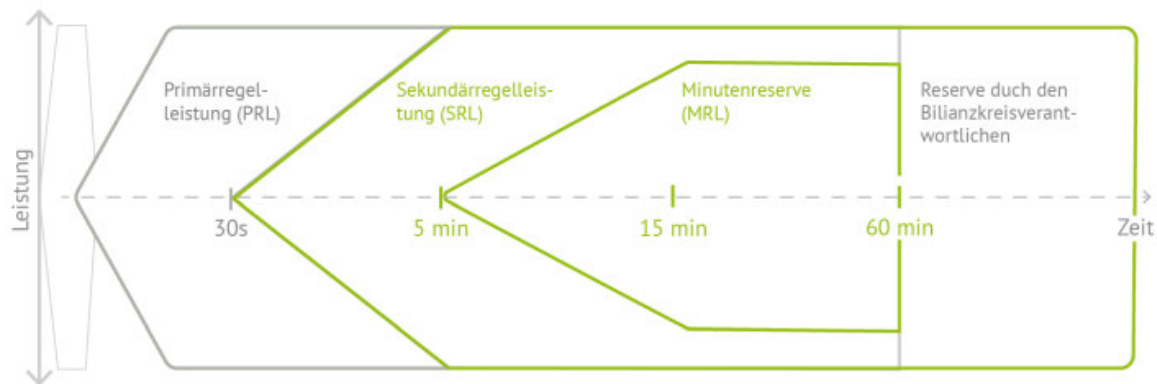


“With his biomethane CHP, Stefan Kienz produces power when it most valuable, based on dispatch signals from the VPP.”

Notstromaggregate im RE-Markt

- Notstromaggregate können grundsätzlich schon lange am Regelle Energiemarkt teilnehmen, aber:
 - Bilanzierung häufig problematisch
 - Anlagen- und Einheitszertifikate sind zusätzliche Hürden

Fazit: Großes ungenutztes Potential liegt brach!



“Die Erlöse aus der Regelle Energie helfen dabei unsere Betriebskosten zu reduzieren.“

Demand side flexibility: industry

Increasing Revenues - Reactive Balancing (Energy) Services

Overview - Industrial production - *Melting tank*

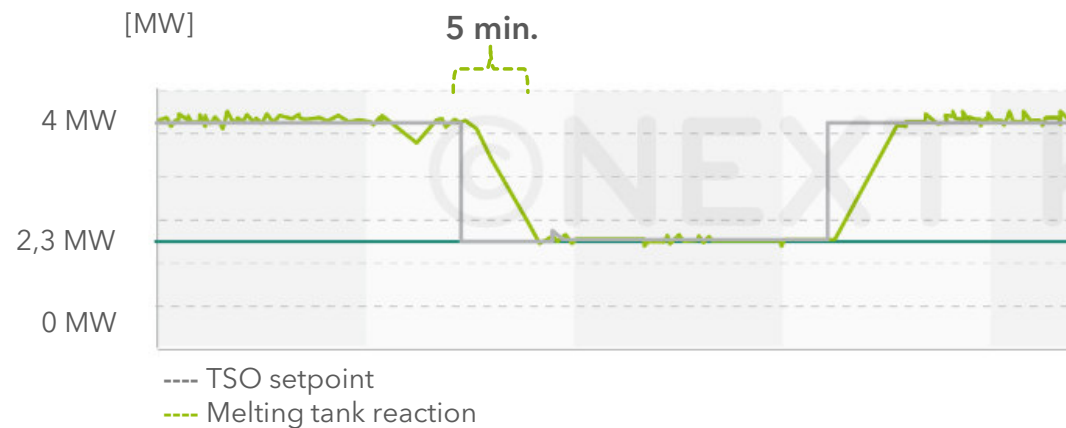
- ▶ Operation of a melting tank for the production of glass fibers
- ▶ Heat supply fossil and electric
- ▶ Flexibility of 1.7 MW
- ▶ Provision of positive balancing service (aFRR)
reaction time: 30 sec.
full power reduction within 5 minutes

Benefits

- ▶ Additional use in the context of peak load management
- ▶ Revenues:
2012: approx. 100.000 € / MW * year
2018: approx. 20.000 € / MW * year

Regulatory Barriers

- ▶ Missing incentives for flexible load operation



Demand side flexibility: pumps

Optimizing Energy Costs - Active Dispatch of Consumers

Overview - Water pumps

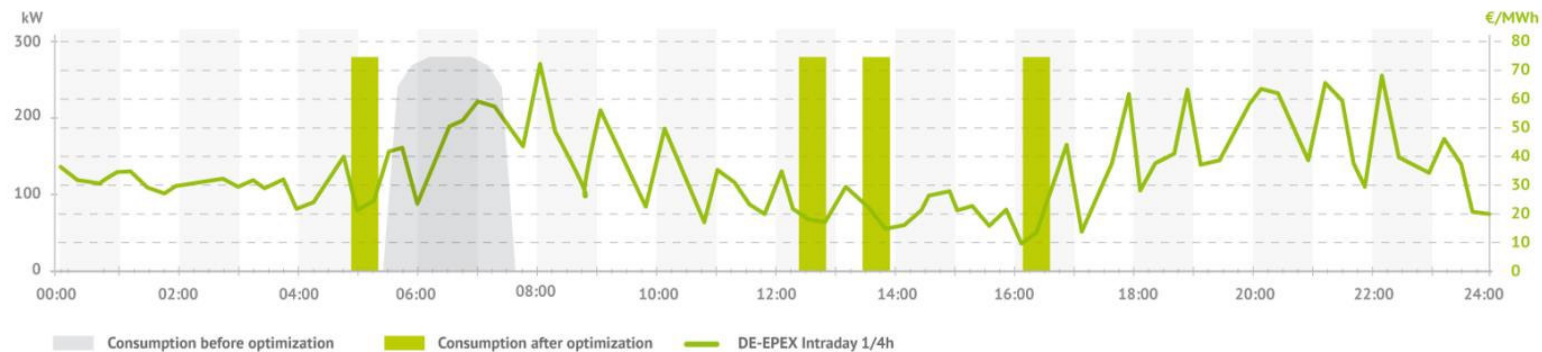
- ▶ Consume power when the demand at the power exchange is low and power costs less
- ▶ Price forecasts in different time intervals available

Benefits

- ▶ Harmonizing power supply and demand for the entire system
- ▶ Saving up to 30% on energy costs

Regulatory Barriers

- ▶ Grid charges for peak demand



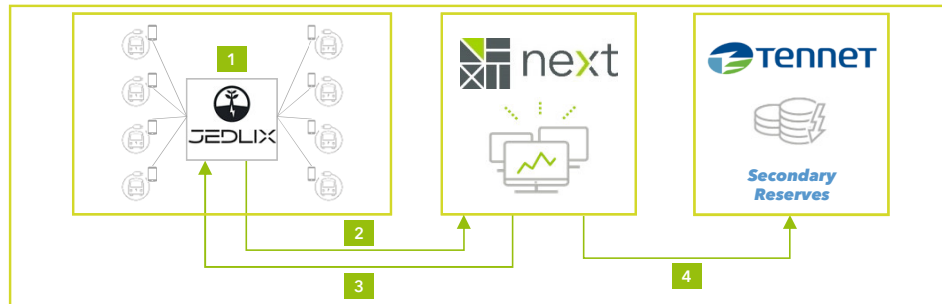
Matthias Reimers shifts the power consumption of his pumps to times with lower power prices.

Clearly Identified Opportunities for Growth

Reactive: Where Next Kraftwerke is Innovating

Monetization of EV Flexibility

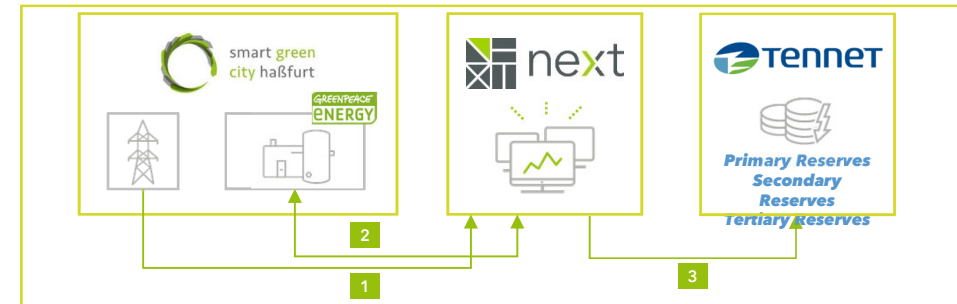
Next Kraftwerke and Vehicle-to-Grid Integration Platform provider Jedlix offer secondary reserve power to the Dutch grid using a pool of electric vehicles (EVs)



- 1 Drivers of EVs indicate their charging preferences on the mobile app developed by Jedlix
- 2 **Using fleet intelligence, the cars are then integrated into Next Kraftwerke's Virtual Power Plant**
- 3 **When a large imbalance occurs in the grid, Next Kraftwerke stops or starts the charging of the EVs in order to counter deficits or excesses of electricity respectively**
- 4 **Flexibility is bid as secondary reserve power to the Dutch TSO Tennet**

Demonstrating the Value of Power-to-Gas

Next Kraftwerke, the City Haßfurt, and Greenpeace Energy integrated a Power-to-Gas unit into NXK's VPP to control the electrolyzer in case of an excess of solar or wind power in the local distribution network area, and market control reserve power to the German grid



- 1 Power consumption data of the distribution network Haßfurt is transmitted to Next Kraftwerke
- 2 **The Power-to-Gas Unit, managed by Greenpeace Energy and the municipal utility of Haßfurt, is integrated into Next Kraftwerke's Virtual Power Plant;**
- 3 **Next Kraftwerke controls the electrolyzer in case of an excess of solar and wind power in the distribution network area**
- Flexibility is bid as control power to the German TSO Tennet



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