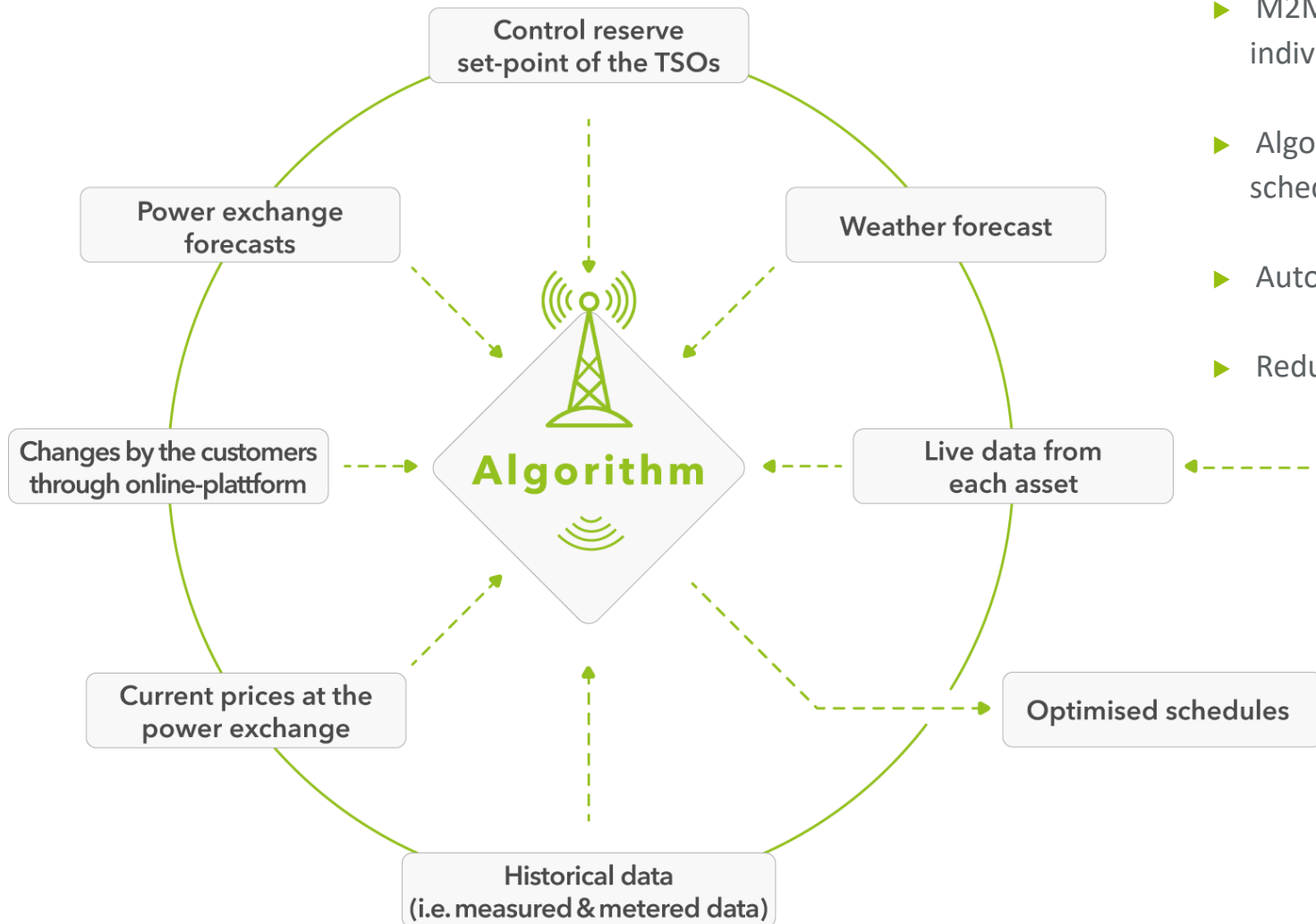


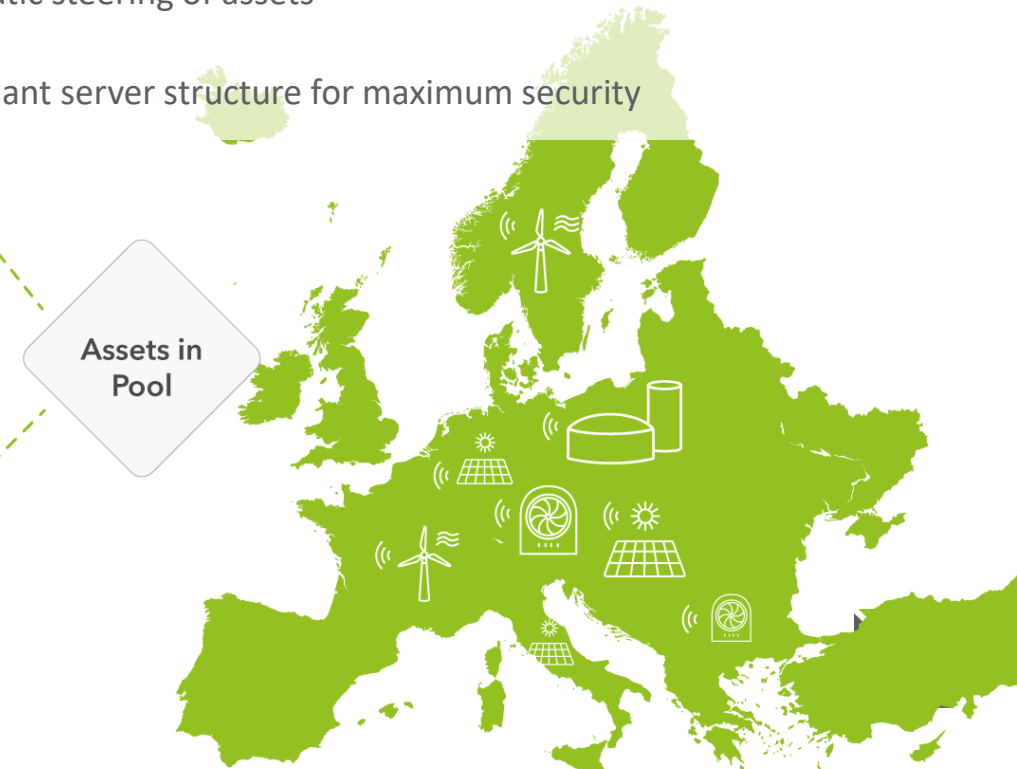


Technology



The control system – heart of the VPP

- ▶ M2M-communication between the control system, individual assets, the TSO and the power exchange
- ▶ Algorithmic calculation of each individual asset's schedule of operation
- ▶ Automatic steering of assets
- ▶ Redundant server structure for maximum security



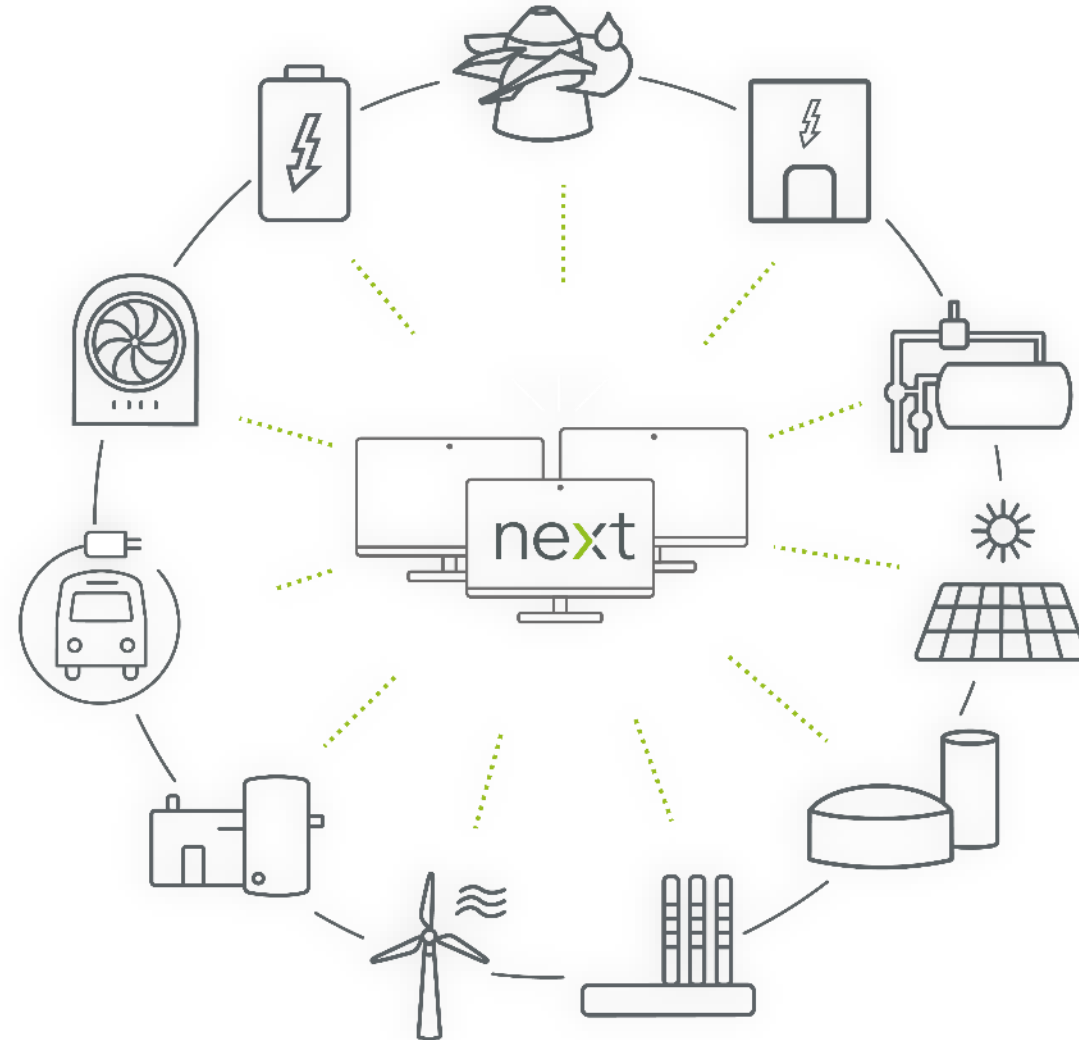
Who is taking part

Asset types in a Virtual Power Plant

- ▶ Biogas
- ▶ Solar
- ▶ Wind
- ▶ Hydro power
- ▶ CHP
- ▶ Renewable power plants
- ▶ Power-to-X
- ▶ Power consumers
- ▶ Utilities / aggregators
- ▶ Batteries
- ▶ Emergency power generators

Interfaces / technologies

- ▶ Next Box
- ▶ Protocol interfaces
- ▶ APIs



Key Data

Sales

627,7 Mio € (2018)

Employees

155

Subsidiaries

10

Aggregated Power

7.142 MW

Aggregated asstes

8.109

Power delivery

140 GWh

R1

57 MW

R2

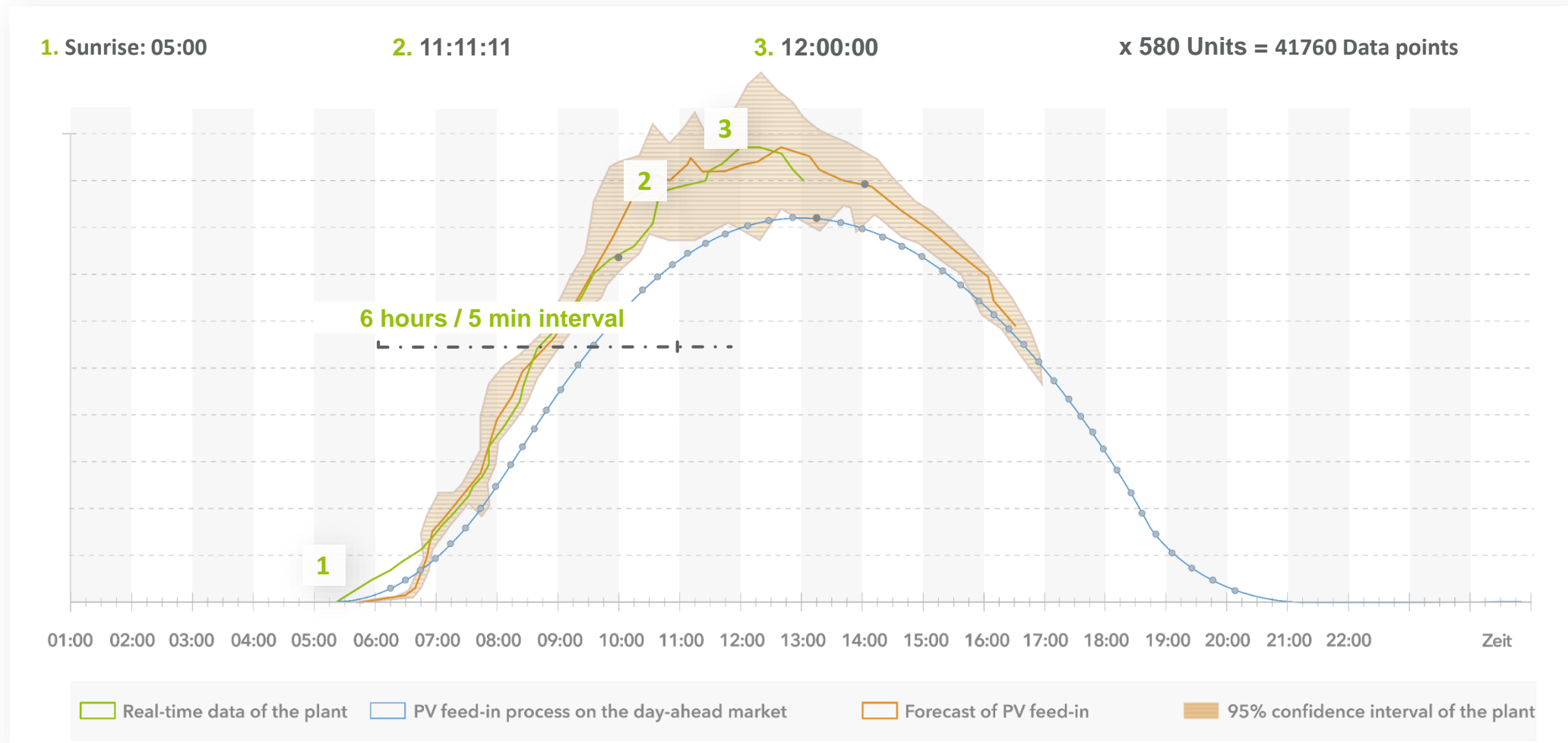
943 MW

R3

1.652 MW



VPP: Forecasting



VPP: Grid Flexibility

How even small assets can provide grid stabilizing flexibility

Overview

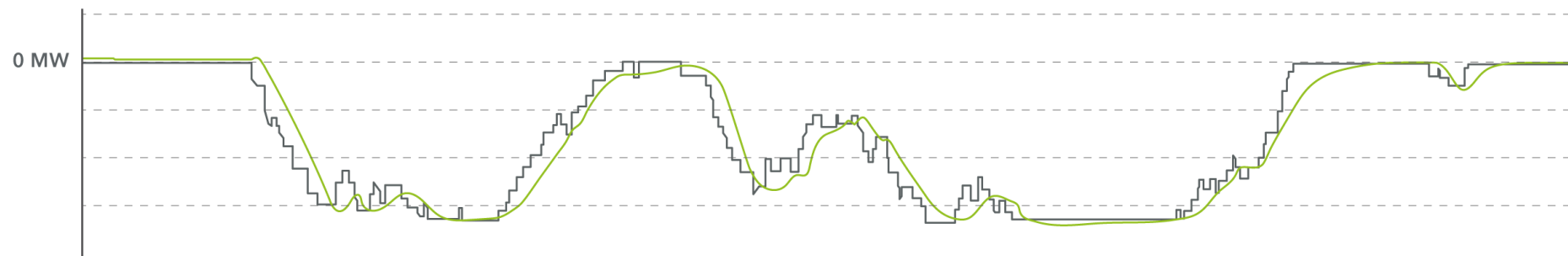
- ▶ As a cluster, assets execute the TSO signal within seconds
- ▶ All control reserve products for all TSO regions in Germany with an available flexibility of: R1: **57 MW**, R2: **943 MW**, and R3: **1652 MW**

Benefits

- ▶ Our Next Pool stabilizes grid frequency and prevents blackouts
- ▶ The revenue is split between the asset owner and Next Kraftwerke



Through the Virtual Power Plant, Onno Wilberts and Guido Koch, owner of a biogas plant in Beverstedt, Lower Saxony, Germany, have been providing grid stabilizing flexibility since 2012.



VPP: Peak load operation

How small assets can gain access to the power markets

Overview

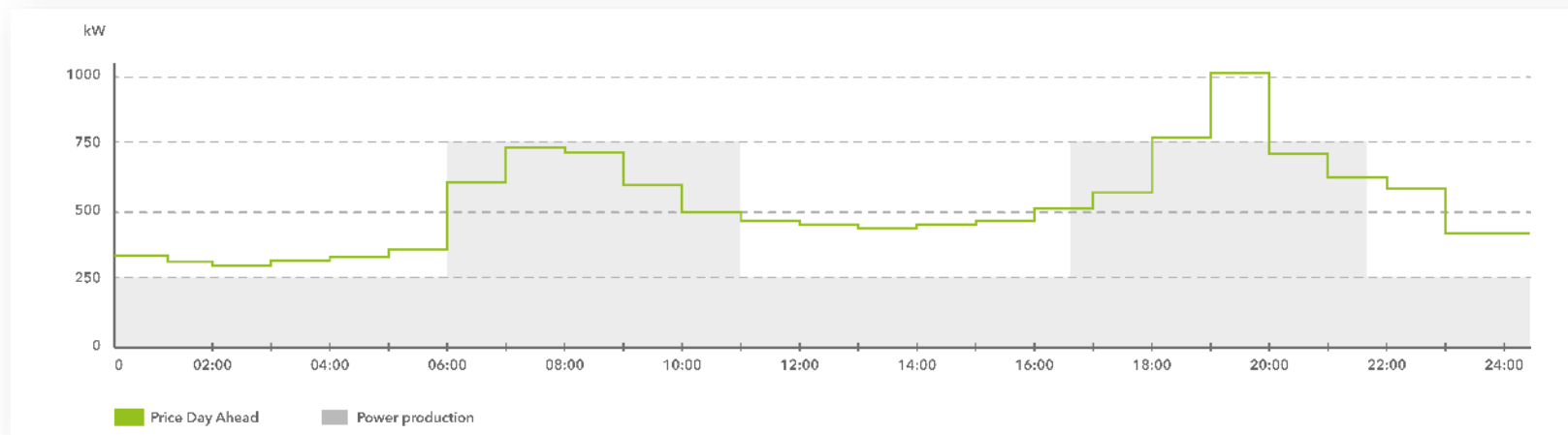
- ▶ Producing power when it is in demand on the power exchange and able to fetch a better price
- ▶ From a weekly schedule to trading based on a 15-minute cycle of optimization: BoE 7 / BoE 24 / BoE 96

Benefits

- ▶ Harmonizing supply and demand of power for the entire system
- ▶ Revenue is split between the owner and Next Kraftwerke



With his biomethane CHP, Stefan Kienz produces power when it is most valuable.



VPP as a Service

How you can operate your own Virtual Power Plant

Overview

- ▶ NEMOCS: uses the same VPP technology as Next Kraftwerke
- ▶ Modular and scalable setup
- ▶ User-friendly operation

Benefits

- ▶ A cost-effective and tailor-made solution for operating your own Virtual Power Plant



Sebastian Hölemann, CTO at Next Kraftwerke, is responsible for the operation and development of the Virtual Power Plant.



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