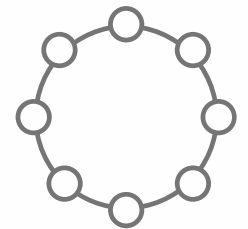


**NEXT**  
KRAFTWERKE

# NEXT KRAFTWERKE

The role of Virtual Power Plants in an increasingly decentralized energy sector



# ENERGIEWENDE MEANS DECENTRALIZATION

Decentralization means the world needs Virtual Power Plants

## SMALL PARTS FORM THE NEXT BIG THING

2000: 1,000 renewable energy power plants

2016: >1.5 million renewable energy power plants

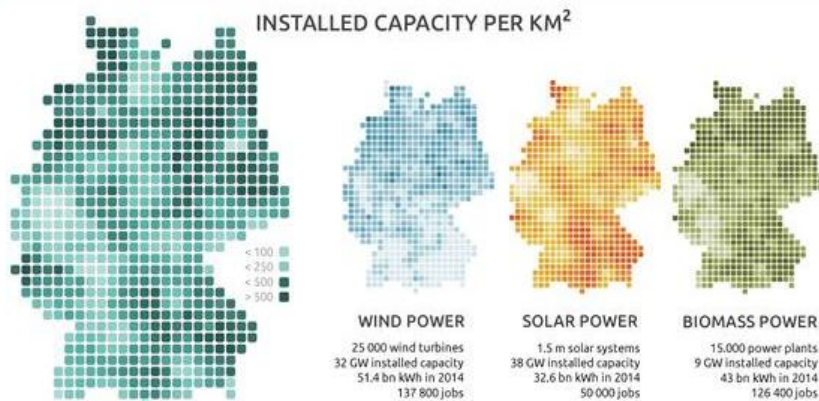
Almost 50 % are owned by (groups of) individuals!



A VPP provides energy security most efficiently:

- ✓ It digitally aggregates the capacity of distributed units,
- ✓ controls them smartly
- ✓ and ensures that supply and demand are met at all times.

### RENEWABLE ENERGY IN GERMANY 2014



Renewable energy sources are important to the Germans



Germans, who would like to produce their own green electricity



#### STATE RANKING

Fulfillment of electricity demand by renewable energy



Source : BNetzA, AEE, PwC, DGS, BDEW, Fraunhofer ISE

Date: April 2015



info@Strom-Report.de

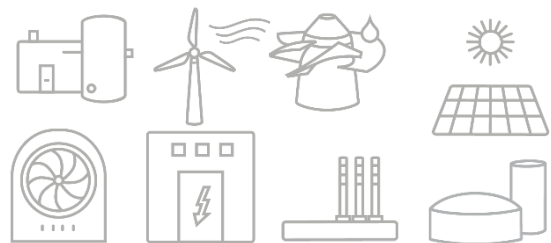
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# Being digital: Thinking in bits and watts

We are a digital aggregator of decentralized power producers & consumers through M2M communication

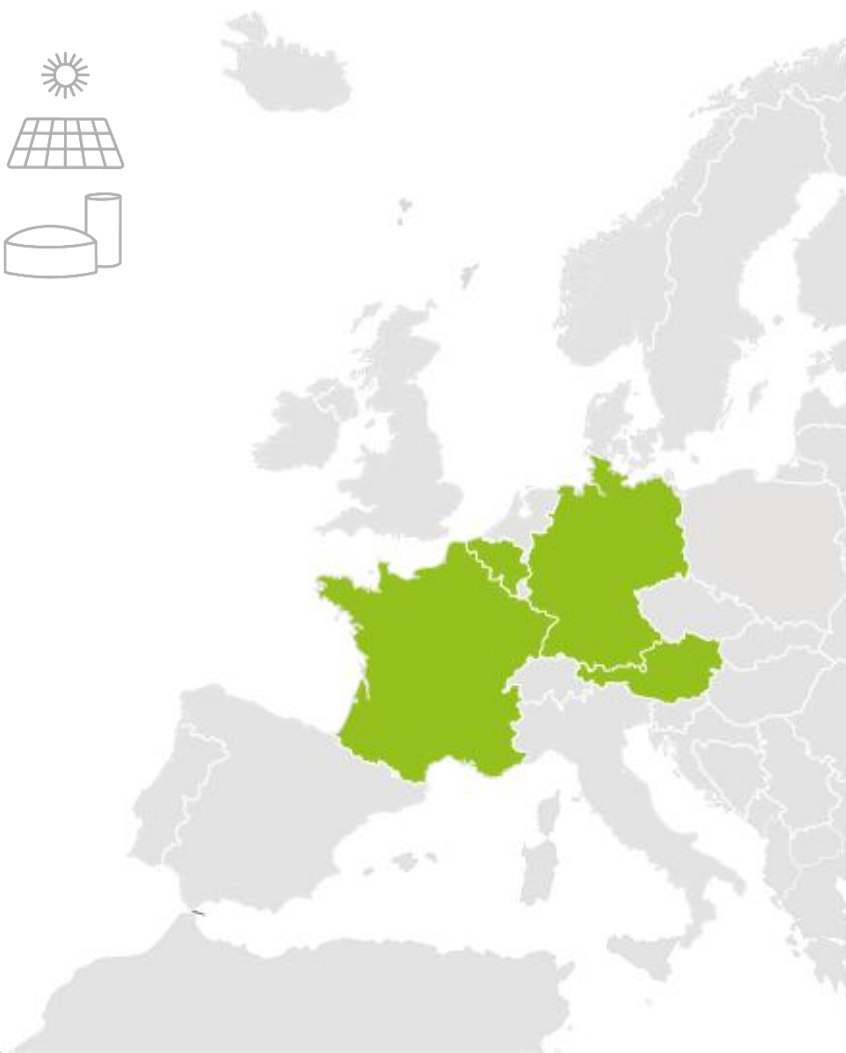
**3,000 UNITS IN FIVE COUNTRIES, 2,000 MEGAWATTS**



**LINKED VIA THE REMOTE CONTROL UNIT NEXT BOX**

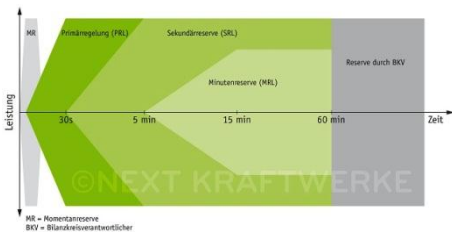


**CONTROLLED BY THE CENTRAL CONTROL SYSTEM**



# BEING FLEXIBLE: PREPARED FOR WHAT COMES NEXT

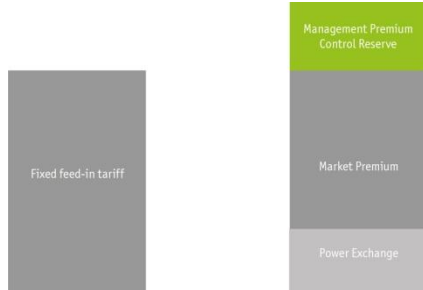
How to utilize the flexibility of renewables



The diagram shows the components of control reserve over time. The y-axis is 'Leistung' (Power) and the x-axis is 'Zeit' (Time) with markers at 30s, 5 min, 15 min, and 60 min. The components are: MR (Noninstantaneous reserve), Primärregelung (PR1) (Primary control), Sekundärreserve (SR1) (Secondary reserve), Minutenreserve (MR1) (Minute reserve), and Reserve durch BKV (Reserve by the grid operator). A legend indicates: NR = Noninstantaneous, BKV = Bilanzkreisverantwortlicher.

## Control Reserve

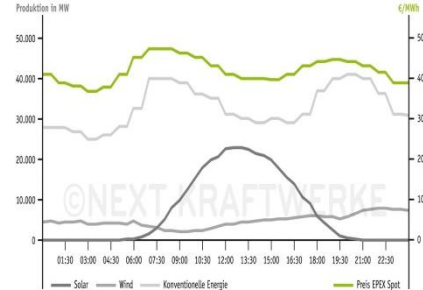
Stabilizing the grid and keeping the grid frequency at 50 Hertz.



The diagram shows two revenue components for services. The first is a grey box labeled 'Fixed feed-in tariff'. The second is a stacked bar chart with three layers: 'Power Exchange' (bottom, grey), 'Market Premium' (middle, dark grey), and 'Management Premium Control Reserve' (top, green).

## Services

Optimal trade with remote-controlled units within the Market Premium Model.



The chart shows 'Produktion in MW' (Production in MW) on the left y-axis and '€/MWh' (€/MWh) on the right y-axis. The x-axis shows time from 01:30 to 22:30. The legend includes: Solar (black line), Wind (grey line), konventionelle Energie (light grey line), and Preis EPEX Spot (green line). The chart shows solar production peaking around 12:00, wind production peaking around 18:00, and conventional energy production peaking around 12:00. The EPEX Spot price is shown as a green line.

## Power Trading

(Short term) trading of power to use the units flexibility profitably.

# DIGITAL, FLEXIBLE, SUSTAINABLE

## THE GOAL

Making 100% renewable energy possible

## THE PATH

Digital, flexible, sustainable

## THE STATUS

One of the largest Digital Utilities in Europe

## THE TEAM

About 100 employees with a broad academic background

## CONTACT

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