GERMAN BATTERY STORAGE: MARKET AND APPLICATIONS

MIDWESTERN STATE LEGISLATORS’ MEETING

OCTOBER 14TH, 2021

Tobias Rothacher
Energy, Environment & Resources
www.gtai.de
Germany Trade & Invest (GTAI) is the economic development agency of the Federal Republic of Germany.
We are on the spot for you worldwide - ensuring that you receive competent support.
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International marketing of Germany as a business and technology location

Business location consultancy services for international investors

Economic promotion of the new federal states and Berlin

Export market information for the German economy
Our advisory services include:

- Market-entry strategy development support
- Tax and legal information and support
- Funding and financing options advice
- Location identification, location visit support
Intro Battery Market
Private applications
Grid applications
Industrial applications
Smart EV Charging
Development of Renewable Energy Systems
Feed-in-Tariff causing dynamic growth

Total capacity of renewables
(2020)
> 1.8 million installations

- Wind energy
- PV
- Biomass

The circle **diameter** is proportional to the electrical capacity

Sources: 50HertzT, TenneT, Amprion, TransnetBW, internal data
On the generation side, we’re well on track
Renewable’s share on Germany’s gross electricity consumption growing beyond expectations

Renewable’s share on Germany’s gross electricity consumption vs. goals of German Energiewende

Sources: BMWi, BDEW 2020
But: Need to change power structure fundamentally
New generation centers will be far from load centers

Source: Bundesnetzagentur 2016
Many use cases for electrical energy storage
Providing grid services, helping industry reduce grid fees, and households increase their own-consumption of cheap PV energy.

<table>
<thead>
<tr>
<th>Utility</th>
<th>Industry</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Utility Image" /></td>
<td><img src="image2" alt="Industry Image" /></td>
<td><img src="image3" alt="Private Image" /></td>
</tr>
</tbody>
</table>

- Control Reserve Power (3 kinds: Primary, Secondary, Tertiary)
- Redispacht
- Black-start capability
- ....

- Reduction of grid fees by reducing $P_{\text{max}}$
- Reduction of grid fees by shifting $P_{\text{max}}$
- Increased own-consumption from PV

- Increased own-consumption from PV
- Special electricity rates for battery swarms
- More autarky

Courtesy: Younicos GmbH/Wemag AG, Tesvolt GmbH, Sonnen GmbH
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Electrical storage: Potential income per use case

Utility and industrial applications generate highest income, currently. Solar-PV business cases become better every year, systematically.

Potential annual income for electrical energy storage per application, 2016 vs 2019*
(in EUR per usable kWh per year)

- Higher PV own-consumption, private, w/o Feed-in tariff
- Higher PV own-consumption, private
- Higher PV own-consumption, industry, w/o Feed-in tariff
- Higher PV own-consumption, industry
- Daily energy trading / Optimization of procurement
- Reduction of grid fees (Reduction of Pmax)
- Disconnectable Loads (Ordinance limited to 2022)
- Minute Reserve Power (positive)
- Minute Reserve Power (negative)
- Secondary Control Power (positive)
- Secondary Control Power (negative)
- Primary Control Power

*GTAI calculation based on FITs, electricity prices and public tenders from 2016 and 2019
Intro Battery Market
Private applications
Grid applications
Industrial applications
Smart EV Charging
PV+Battery reached Grid-Parity in 2018
Saving energy costs while becoming 60-80% energy independent

Anticipated development of electricity costs for PV and PV+Battery
(2010 – 2020, in EUR/kWh)

¹ Model calculation for rooftop systems, based on 802 kWh/kWp (Frankfurt/Main), 100% financing, 6% interest rate, 20 year term, 2% p.a. O&M costs. ² based on 5,000 cycles, C2, 87% system efficiency. Sources: Own calculation; Model Calculation: Deutsche Bank 2010; Electricity Prices: BDEW 2018; thereafter: own estimate at 0.29 EUR/kWh.
Falling battery prices make storage profitable
End-customer prices of Li-systems have halved within the past 4 years

End-user system prices for private PV-batteries in Germany
(in € per Usable kWh, incl. VAT, excl. Installation)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pb</th>
<th>Li</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td>H2</td>
<td>2013</td>
<td>2014</td>
</tr>
<tr>
<td>H1</td>
<td>2014</td>
<td>2014</td>
</tr>
<tr>
<td>H2</td>
<td>2014</td>
<td>2015</td>
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<td>H1</td>
<td>2015</td>
<td>2015</td>
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<tr>
<td>H2</td>
<td>2015</td>
<td>2016</td>
</tr>
<tr>
<td>H1</td>
<td>2016</td>
<td>2016</td>
</tr>
</tbody>
</table>

Source: RWTH Aachen 2017 (Monitoring Report for KfW storage program)
PV-Batteries in Germany: Strong market growth
88k systems sold in 2020. Majority of new PV systems come with ESS.

Note: BSW 2021

PV-battery systems installed in Germany
(Number of systems, cumulated)
Still: Enormous potential for further growth

Only 8% of rooftop PV systems in Germany are equipped with a battery today – in 10 years it could be well over 80%.

Rooftop PV Systems (<30kWp) vs. PV-battery systems
(Number of systems, 2013 – 2018)

Note: “rooftop PV” is referring to PV systems < 30 kWp
Sources: Federal Network Agency 2017, BSW 2017, RWTH Aachen 2017
Gigantic PV-battery retrofit potential
More than 1 million existing PV systems could add storage from 2021

Private PV-Systems exiting Feed-in tariff
(Number of systems, < 30 kWp)

Commercial PV-Systems exiting Feed-in tariff
(Number of systems, > 30 kWp and < 750 kWp)

Source: Federal Network Agency, BSW, 2017
Potential annual income with PV storage in 2017

Based on 250 storage cycles per year and 0.08€ value per stored kWh for industrial, 0.16€ for private – value rising every year

Potential annual income for PV storage for the year 2020

(in EUR per Usable kWh, based on Feed-in tariffs and electricity prices in 2020)

Industrial: FIT: 10 ct./kWh, Electricity price: 20 ct./kWh, Storage system efficiency: 85% => Value per stored kWh = 20 ct./kWh – (10 ct./kWh / 0.85) = 8.24 ct./kWh

Private: FIT: 12 ct./kWh, Electricity price: 30 ct./kWh, Storage system efficiency: 85% => Value per stored kWh = 30 ct./kWh – (12 ct./kWh / 0.85) = 15.88 ct./kWh
New electricity tariff models for Prosumers

New tariff and service models for PV/Storage clouds emerging

ESS Manufacturers

- Sonnen
- sonnenFlat
- Caterva
- Caterva-Sonne
- DEV
- Senec.CLOUD
- E3/DC
- ZERO

Utilities

- Eon
  - Solar Cloud
- ENBW
  - Solar Plus
- Lichtblick
  - Schwarm-Batterie
- Beegy
  - beegyLIVE
Intro Battery Market
Private applications
Grid applications
Industrial applications
Smart EV Charging
Public tenders for storage to stabilize the grid

Batteries are suitable for 8 out of 12 kinds of grid services. 4 are publicly tendered today. Others are based on bilateral agreements.

TSO’s annual spendings for grid services in Germany

<table>
<thead>
<tr>
<th>Service</th>
<th>2018 (Million EUR)</th>
<th>2017 (Million EUR)</th>
<th>2016 (Million EUR)</th>
<th>Batteries suitable?</th>
<th>Public tenders?</th>
</tr>
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<tbody>
<tr>
<td>Curtailment of renewables</td>
<td>500</td>
<td>400</td>
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<tr>
<td>Redispatch</td>
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<td>NO</td>
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<td>Reserve power plants (provision)</td>
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<td>NO</td>
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<tr>
<td>Compensation of grid losses</td>
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<td></td>
<td></td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Reserve power plants (usage)</td>
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<td></td>
<td></td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Primary Control Power</td>
<td></td>
<td></td>
<td></td>
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<td>YES</td>
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<tr>
<td>Secondary Control Power</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Countertrading</td>
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<td>NO</td>
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<tr>
<td>Disconnectable loads</td>
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<td>YES</td>
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<tr>
<td>Tertiary Control Power</td>
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<td>YES</td>
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<td>Reactive Power</td>
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<td></td>
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<tr>
<td>Black start capability</td>
<td></td>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

Source: Federal Network Agency 2020
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The German Control Power Market
Interaction between primary, secondary and tertiary control power

Outage in a power plant in Saxony-Anhalt
Primary control power
Secondary control power
Tertiary control power

Hz
50,00
49,98
49,96
49,94
49,92

PCR
SCR
TCR
Demand for Control Power

Highest amount of power is required for TCR – Lowest for PCR

Source: Federal Network Agency 2020 *in the coupled European markets Germany, Austria, Switzerland, The Netherlands, Belgium and France
Prices for Control Power – in € per kW

Highest average power prices for PCR – Lowest for TCR

Annual income for PCR-power*
(in € per kW p.a.)

Annual income for SCR-power*
(in € per kW p.a.)

Annual income for TCR-power*
(in € per kW p.a.)

Source: regelleistung.net, 2020. *Based on average prices of all tenders during respective year
Prices for Control Power – in € per required kWh

PCR requires 30 min of capacity, positive AND negative.
SCR and TCR require 4 hours of capacity, either positive or negative.

<table>
<thead>
<tr>
<th>Annual income for PCR-power* (in € per kWh required capacity)</th>
<th>Annual income for SCR-power* (in € per kWh required capacity)</th>
<th>Annual income for TCR-power* (in € per kWh required capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>per kWh reserved (30min positive + 30min negative)</td>
<td>per kWh reserved (4h positive)</td>
<td>per kWh reserved (4h positive)</td>
</tr>
<tr>
<td>per kWh reserved (4h negative)</td>
<td>per kWh reserved (4h negative)</td>
<td></td>
</tr>
</tbody>
</table>

Source: regelleistung.net, 2020. *Based on average prices of all tenders during respective year

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Capacity requirements for PCR vs. SCR and TCR

PCR requires 30 min of capacity, positive AND negative. SCR and TCR require 4 hours of capacity, either positive or negative.

Potential Operating range for a Battery in PCR (% State of Charge, based on Usable Capacity)

Pot. Operating range for a Battery in SCR / TCR (% State of Charge, based on Usable Capacity)

Source: regelleistung.net
Potential income providing Control Power

PCR and Disconnectable loads provide same income per kW and kWh. SCR and TCR get 4 times more income per kW, than per kWh capacity.

Potential income per kW
(in € per kW p.a.,)

<table>
<thead>
<tr>
<th>Control Power</th>
<th>2019</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Control Power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Control Power (positive)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Control Power (negative)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minute Reserve Power (positive)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minute Reserve Power (negative)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Potential income per required kWh
(in € per required kWh p.a.,)

Source: regelleistung.net, 2020. *Based on average prices of all tenders during respective year
Intro Battery Market
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Development of grid fees in Germany
Grid fees have been increasing 4-7% p.a. on average since 2011. Energy storage systems can help industry reduce these costs.

Industrial electricity consumers
(Number of metering points, 2019)

Development of grid fees
(EURct. per kWh)

Source: Federal Network Agency 2017
Reducing grid fees by: Peak shaving

Power prices are part of a company’s grid fees. They range between 20 and 100+ € per kW, depending on region / DSO.

Example: Load profile of a milking business (in kW)

- Load w/o storage
- Peak load w/o storage

Cutting peak by 30 kW / 30 kWh storage (in kW)

- Load w/o storage
- Load with storage
- Peak load with storage

Discharging

Charging
Reducing grid fees by: Increasing “Usage hours”

Annual Usage hours = Annual energy consumption / Annual peak power
⇒ High usage hours are rewarded by lower grid fees

Example: Load profile of a milking business (in kW)

- Load w/o storage
- Peak load w/o storage

<table>
<thead>
<tr>
<th>Time</th>
<th>Load w/o storage</th>
<th>Peak load w/o storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4:00</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>8:00</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>12:00</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>16:00</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>20:00</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

Energy: 270 MWh
Peak power: 130 kW
⇒ Usage hours: 2077 h

Cutting peak by 30 kW / 30 kWh storage (in kW)

- Load w/o storage
- Load with storage
- Peak load with storage

<table>
<thead>
<tr>
<th>Time</th>
<th>Load w/o storage</th>
<th>Peak load w/o storage</th>
<th>Load with storage</th>
<th>Peak load with storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td>140</td>
</tr>
<tr>
<td>4:00</td>
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<td>120</td>
<td>120</td>
</tr>
<tr>
<td>8:00</td>
<td>100</td>
<td>100</td>
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<td>100</td>
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<tr>
<td>12:00</td>
<td>80</td>
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<td>80</td>
<td>80</td>
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<tr>
<td>16:00</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
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<tr>
<td>20:00</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

Discharging
Energy: 270 MWh
Peak power: 130 kW
⇒ Usage hours: 2077 h

Charging
Energy: 270 MWh
Peak power: 100 kW
⇒ Usage hours: 2700 h
Reducing grid fees by: Increasing “Usage hours”
Annual Usage hours = Annual energy consumption / Annual peak power
⇒ High usage hours are rewarded by lower grid fees

Example: Load profile of a milking business (in kW)

- Load w/o storage
- Peak load w/o storage

Cutting peak by 30 kW / 30 kWh storage (in kW)

- Load w/o storage
- Load with storage
- Peak load with storage

---

Example grid fees <2,500 h
- Energy: 0.044 €/kWh
- Power: 20 €/kW

Example grid fees >2,500 h
- Energy: 0.012 €/kWh
- Power: 80 €/kW
Reducing grid fees by: Increasing “Usage hours”
Annual Usage hours = Annual energy consumption / Annual peak power
⇒ High usage hours are rewarded by lower grid fees

Example: Load profile of a milking business (in kW)

<table>
<thead>
<tr>
<th>Time</th>
<th>Load w/o storage</th>
<th>Peak load w/o storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8:00</td>
<td>0</td>
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<tr>
<td>12:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16:00</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20:00</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Power: 2,600 € p.a.
Total: 14,469 € p.a.

Cutting peak by 30 kW / 30 kWh storage (in kW)

<table>
<thead>
<tr>
<th>Time</th>
<th>Load w/o storage</th>
<th>Load with storage</th>
<th>Peak load w/o storage</th>
<th>Peak load with storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>0</td>
<td>120</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4:00</td>
<td>0</td>
<td>120</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8:00</td>
<td>0</td>
<td>120</td>
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</tr>
<tr>
<td>12:00</td>
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<tr>
<td>16:00</td>
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<td>120</td>
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<tr>
<td>20:00</td>
<td>0</td>
<td>120</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Discharging

Power: 8,000 € p.a.
Total: 11,237 € p.a.

⇒ 3,232 € savings p.a.
Reducing grid fees by: Load shifting
“Atypical grid usage” allows the reduction of grid fees up to 80%

Example: Load profile of a molding business (in kW)

Shifting load by 30 kW / 30 kWh storage (in kW)

Source: Federal Network Agency, September 2011:
Leitfaden zur Genehmigung von individuellen Netzentgelten nach § 19, Abs. 2 S. 1 StromNEV und von Befreiungen von den Netzentgelten nach § 19 Abs. 2 S. 2 StromNEV
Reducing grid fees by: Load shifting

“Atypical grid usage” allows the reduction of grid fees up to 80%

Example: Load profile of a molding business (in kW)

<table>
<thead>
<tr>
<th>Time</th>
<th>Load</th>
<th>General peak load</th>
<th>Peak load in &quot;High load period&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>300</td>
<td>400</td>
<td>350</td>
</tr>
<tr>
<td>4:00</td>
<td>300</td>
<td>400</td>
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<tr>
<td>8:00</td>
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<tr>
<td>12:00</td>
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<tr>
<td>16:00</td>
<td>300</td>
<td>400</td>
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</tr>
<tr>
<td>20:00</td>
<td>300</td>
<td>400</td>
<td>350</td>
</tr>
</tbody>
</table>

Energy: 2,866 MWh (12€/MWh)
Power: 420 kW (80€/kW)

Shifting load by 30 kW / 30 kWh storage (in kW)

<table>
<thead>
<tr>
<th>Time</th>
<th>Load with storage</th>
<th>General peak load</th>
<th>Peak load in &quot;High load period&quot;</th>
<th>Load w/o storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
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<td>350</td>
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<td>16:00</td>
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<tr>
<td>20:00</td>
<td>300</td>
<td>400</td>
<td>350</td>
<td>300</td>
</tr>
</tbody>
</table>

Energy: 2,866 MWh
Power: 420 kW

P\text{max} \text{ in } "High load period": 350 kW

Source: Federal Network Agency, September 2011:
Leitfaden zur Genehmigung von individuellen Netzentgelten nach § 19, Abs. 2 S. 1 StromNEV und von Befreiungen von den Netzentgelten nach § 19 Abs. 2 S. 2 StromNEV
Reducing grid fees by: Load shifting

“Atypical grid usage” allows the reduction of grid fees up to 80%

Example: Load profile of a molding business (in kW)

Shifting load by 30 kW / 30 kWh storage (in kW)

Energy: 34,386 € p.a.
Power: 33,600 € p.a.
Total: 67,986 € p.a.

Energy: 34,386 € p.a.
Power: 25,600 € p.a.
Total: 59,986 € p.a.

⇨ 8,000 € savings p.a.

Source: Federal Network Agency, September 2011:
Leitfaden zur Genehmigung von individuellen Netzsentgelten nach § 19, Abs. 2 S. 1 StromNEV und von Befreiungen von den Netzsentgelten nach § 19 Abs. 2 S. 2 StromNEV
Reducing grid fees by: Increasing “Usage hours” II

“Energy intensive consumers” (> 10 GWh/a) can further reduce grid fees up to 80%, in case they reach more than 7,000 usage hours p.a.

Example: Load profile of a (big) molding corp. (in kW)

Cutting peak by 300 kW / 300 kWh storage (in kW)

Energy: 28.65 GWh
Peak power: 4200 kW
⇒ Usage hours: 6,821 h

Energy: 28.65 GWh
Peak power: 3900 kW
⇒ Usage hours: 7,346 h

Source: Stromnetzentgeltverordnung („StromNEV“), §19, Abs. 2, S. 2 & 3
Reducing grid fees by: Increasing “Usage hours” II

“Energy intensive consumers” (> 10 GWh/a) can further reduce grid fees up to 80%, in case they reach more than 7,000 usage hours p.a.

Example: Load profile of a (big) molding corp. (in kW)

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Load w/o storage</th>
<th>Peak load with storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
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<td>4700</td>
</tr>
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<td>1000</td>
<td>4000</td>
</tr>
<tr>
<td>8:00</td>
<td>1500</td>
<td>3500</td>
</tr>
<tr>
<td>12:00</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>16:00</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>20:00</td>
<td>3000</td>
<td>2000</td>
</tr>
</tbody>
</table>

Cutting peak by 300 kW / 300 kWh storage (in kW)

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Load w/o storage</th>
<th>Peak load w/o storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:00</td>
<td>500</td>
<td>4700</td>
</tr>
<tr>
<td>4:00</td>
<td>1000</td>
<td>4000</td>
</tr>
<tr>
<td>8:00</td>
<td>1500</td>
<td>3500</td>
</tr>
<tr>
<td>12:00</td>
<td>2000</td>
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<td>16:00</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>20:00</td>
<td>3000</td>
<td>2000</td>
</tr>
</tbody>
</table>

Anticipating an individual grid fee reduction of 33%:

- Power: 336,000 € p.a.
- Total: 679,860 € p.a.

⇒ 224,354 € savings p.a.

Source: Stromnetzentgelterordnung („StromNEV“), §19, Abs. 2, S. 2 & 3
Intro Battery Market
Private applications
Grid applications
Industrial applications
Smart EV Charging
EV development in Germany
2020: Market break-through for PHEV + BEV in Germany

Electric vehicles (PHEV + BEV)
(Number of units, 2011 – 2020)

Goal: 7 – 10 Million EV’s by 2030

Sources: IEA 019, KBA 2021
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EV Charging Infrastructure

Growth in the EV market causes demand for charging stations – potentially equipped with batteries and smart grid technologies

Electric vehicles (PHEV + BEV) vs. public charging stations
(Number of units, 2011 – 2020)

Goal: >1 Million Charging Points by 2030

Sources: IEA 2019, KBA 2021, EAFO 2021
Vehicle-to-Grid: new standards on the way

2018: First Nissan Leaf got prequalified for primary control power.
2020: General V2G communication standards under development.

Source: Nissan, Oct. 2018

Co-Project by

- The Mobility House (energy management technology)
- ENERVIE (energy supplier)
- Amprion (transmission system operator)
- Nissan (V2G vehicle)
SUMMARY
Smart Cities: Boosting the Energy Transition

Smart meters and flexible consumption will allow more usage of Renewables

% Renewable’s share of electricity

GW installed battery storage*

Million Smart Meters

Source: BNetzA, 20201* Prognosis Scenario B Netzentwicklungsplan; Graph: GTAI

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Smart Cities: Boosting the Energy Transition

Smart energy distribution enables coupling renewables with transport and heating

- **% Renewable’s share of electricity**: 46 in 2020, 60 in 2035*
- **GW installed battery storage**: 2.3 in 2020, 5 in 2035*
- **Smart Meters**: 18 in 2020, 50 in 2035*
- **Million Heat pumps**: 5 in 2020, 1.1 in 2035*
- **Million Electric Vehicles**: 0.7 in 2020, 12 in 2035*
- **Million EV Charging Stations**: 0.04 in 2020, >1 in 2035*

Source: BNetzA, 20201* Prognosis Scenario B Netzentwicklungsplan; Graph: GTAI

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GTAI supports international companies entering German market:

- Deep info on your market and entry strategy support
- Screening funding and financing options
- Finding the best location for your requirements support
- Tax and legal info for smooth applications and quick setup
- Free of charge
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