



COMPANY VISIT

Workshop of the 'Sustainability and the Internet' IRTF Research Group

Very inspiring workshop – key takeaways for me

- Typical IT / Internet Group question: **Which „protocol“ will be used** to control all those assets on all voltage levels?
 - In my opinion this is already there: it's **„money per kWh or kW per time period“**
- **Cyber Security:** Ban on High-Risk Inverter Suppliers from EU Funding
 - the **Frequency** is a trustful communication signal that should be kept (as last resort)
- Data Centers...

Very inspiring workshop – key takeaways for me

- **Climate change has arrived**
 - ...and Germany should **start using ACs** (or other forms of active cooling and thermal activation of buildings)
 - because 2026 is still going to be the **coldest summer and highest river water level for the rest of our lives**
- Found it personally very interesting to compare Internet to Energy infrastructure and **listen to experts** opinion about similarities and differences
- Not only **climate impact adaptation** but **active shaping of the future**
 - In Germany we always talk about „**Energiewende**“ – „**energy transition**“
 - At FENECON we try to envision a „**energy transitioned world**“ – die „**energiegewendete Welt**“
 - We identify this as **the challenge of our generation**
 - And we call the pathway to this vision, the „**energy journey**“

We did it before...

Generational Challenge of Mobility

- Before: Low infrastructure costs (dirt road) & high individual costs
- After: high infrastructure costs (railway track, train) and low individual costs
- In **just a few generations**, a mobility infrastructure has been created
- **We still use it today**
- Only **maintenance costs** are necessary



Generational Challenge of telecommunication

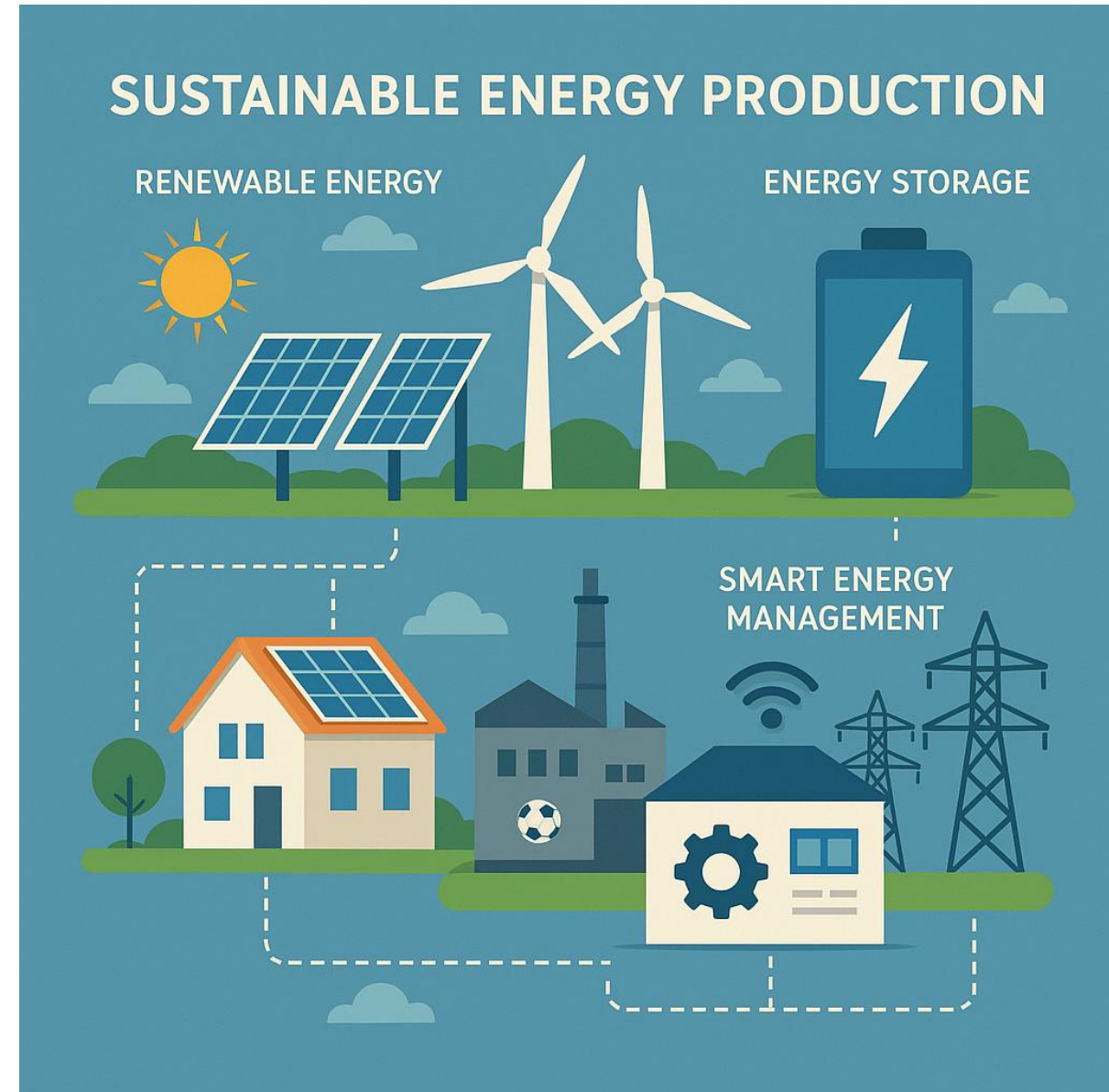
- Before: Coins, local/long distance, one-on-one communication, synchronous
- After: Flat rate, everywhere, broadcast, asynchronous / time-shifted
- In **just one generation**, a communication infrastructure was created
- Ours and subsequent generations use it cheaply
- Only **maintenance** costs are necessary
- At the same time, the worldwide challenge of **knowledge sharing** was also solved



KI-generiert

Generational Challenge of Energy supply

- Before: Central power plants, fossil fuels & labour, “utilities” / “supplier”, synchronous
- After: decentralised generation & consumption, bidirectional connection, no fuels & labour, asynchronous
- **Solar** and **wind** generate **surplus** depending on the weather
- **Energy storage** buffers generated energy
- **Energy management** distributes consumed energy
- Facilities run for **decades**, only **maintenance** costs
- For electricity, heating/cooling, mobility
- Our generation is creating **an energy infrastructure**
- At the same time, an important part of the climate topic will be also solved



AI generated

FENECON GmbH



- **Germany's largest manufacturer** of Residential, Commercial, and Industrial energy storage systems
- Technology and innovation leader in **AI-driven energy management solutions**.
- The **most awarded company** in the global energy storage sector
- **Stable, profitable, and scalable** organization with established customer base and sales channels
- **Initiator of OpenEMS** – the Open-Source Operating System for the Energy Transition

Deep value creation

2

Production Sites in Germany

1

(Under Development)
Production Site in USA



2011

founded as a
"Garage Startup"
Owner Managed Company

380

Employees

Organic Growth Reaching

130m

€ Revenue

13m

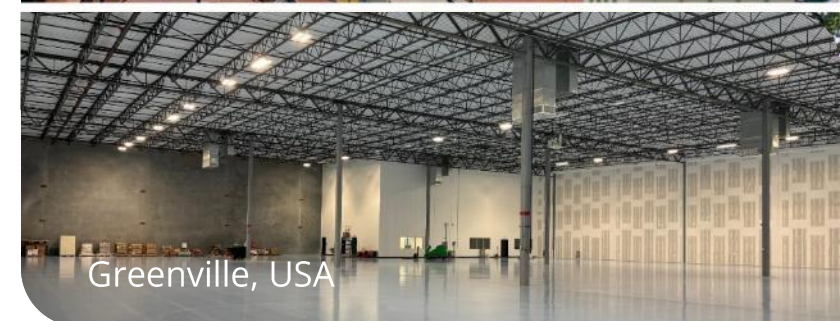
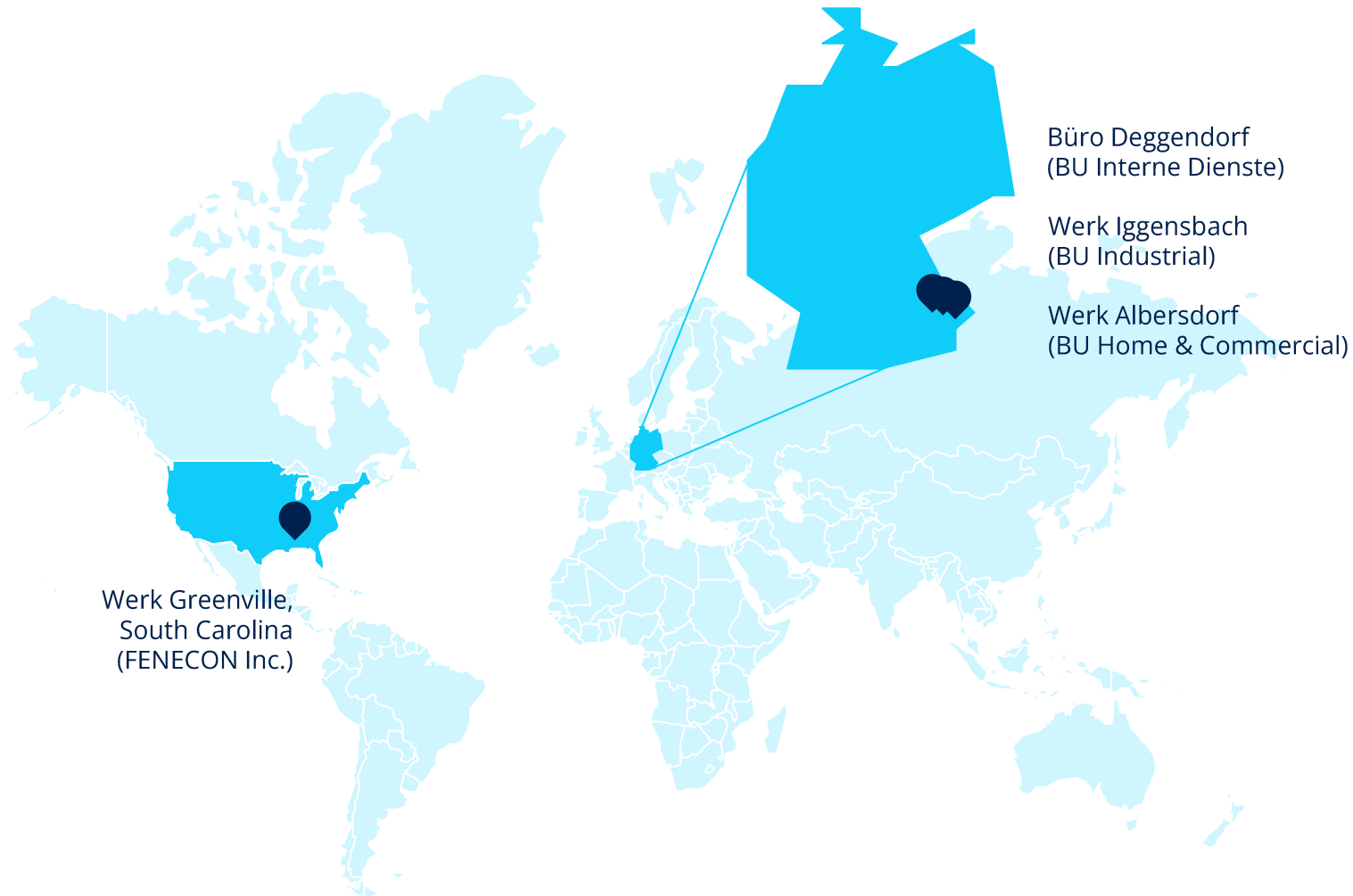
€ EBITDA



PARTNER OF YOUR ENERGY JOURNEY

4 Standorte mit über 380 Mitarbeitern

FENECON Standorte





Products

FENECON Home & Commercial

HOME



8,4 – 168 kWh

6 – 30 kW

COMMERCIAL



28 – 1050 kWh

50 – 500 kW

FENECON Industrial

INDUSTRIAL S



164 kWh



184 kW

INDUSTRIAL M



452 – 904 kWh



184 – 368 kW

INDUSTRIAL L



1.288 kWh



736 kW

INDUSTRIAL XL



4.072 kWh



1.500 kW



Vehicle battery to stationary storage

From vehicle battery to stationary storage

- Different **perspective to Bidirectional Charging**
- **New battery modules or packs from the automotive industry**
- Example Mercedes EQA/EQB
 - Battery update for more range
 - Buffer over Start of Production?
 - Production chain
 - Certificates
 - Sea transport
 - 10 production days buffer for 175 vehicles per day = 126 MWh
- Industrial L: Batteries from 18 electric cars - 72 battery modules - 24 drawers



From vehicle battery to stationary storage

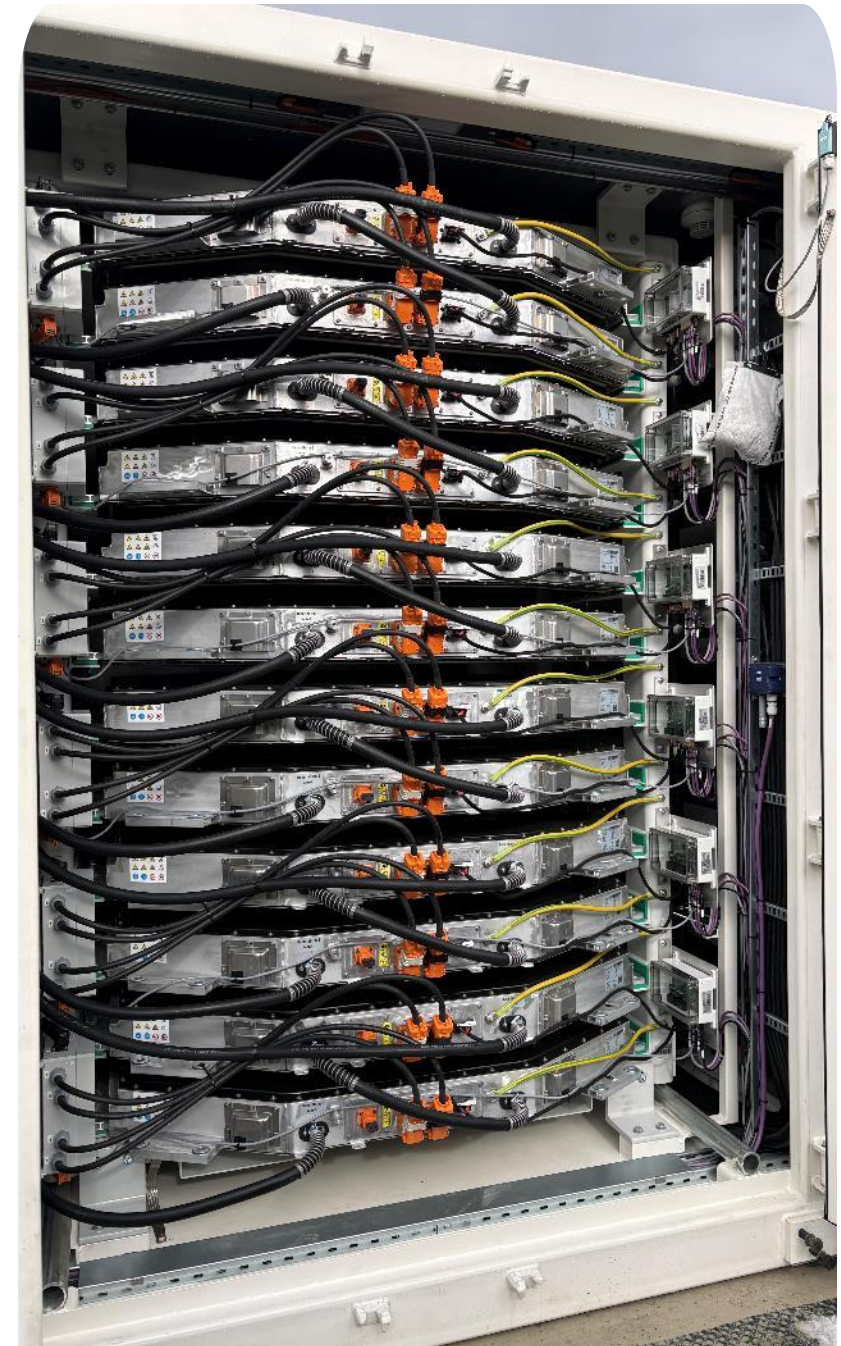
- Fisker Ocean: Production of 1500 cars per week at MAGNA (Graz/Austria)
- Production stop: approx. **10,000 x 113 kWh** battery packs obsolete
- Complete contingent > **1 GWh** purchased from FENECON
- Complex development and high-quality implementation as an industrial storage series product Made-in-Germany
- "Triple winner" among BESS marketers:
 - Highest round-trip efficiencies: **95%**
 - Highest availability: **98%**
 - Highest yields per MW or MWh



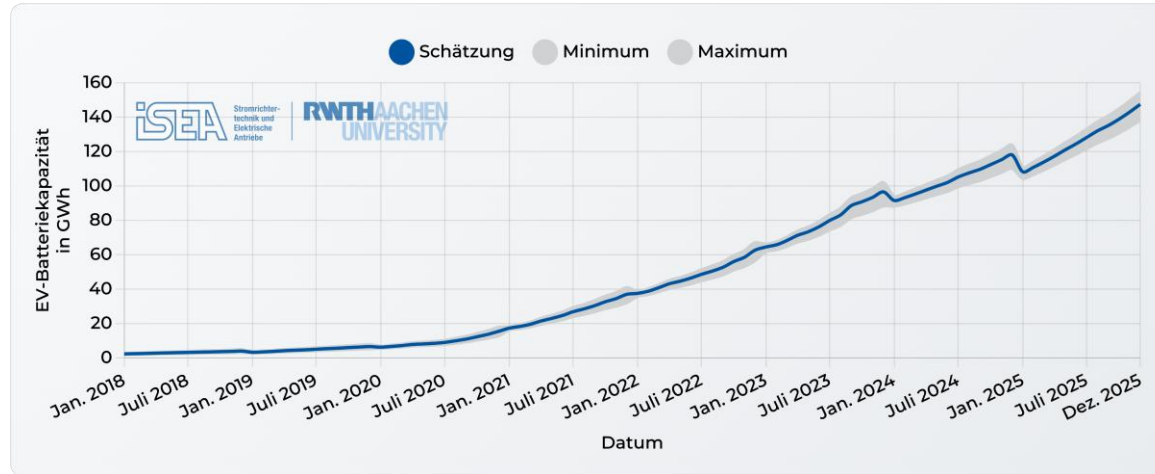
Electric Vehicle Batteries

Automotive industry offers the highest quality

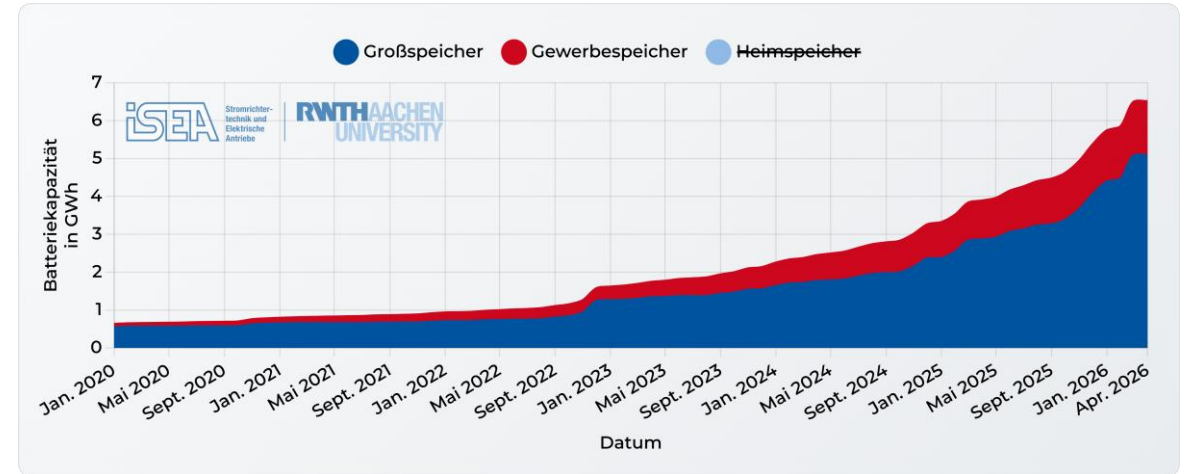
- Highest product quality & long service life
- **Zero-defect philosophy**
- Monitoring option through **integrated BMS**
- Integrated **sensor technology**
- Integrated water-glycol **cooling**
- Crash-tested & automotive safety architecture
- Connected transportable in the large storage system
- High efficiency and performance of the batteries
- No SoC jumps/recalibration, no daily cycle limitation



Electric vehicle batteries vs. stationary storage systems



<https://battery-charts.de/de/mobility-charts-de/>



<https://battery-charts.de/de/battery-charts-de/>

In Germany, more than **20 times** more batteries are currently installed in electric vehicles than in large storage systems.

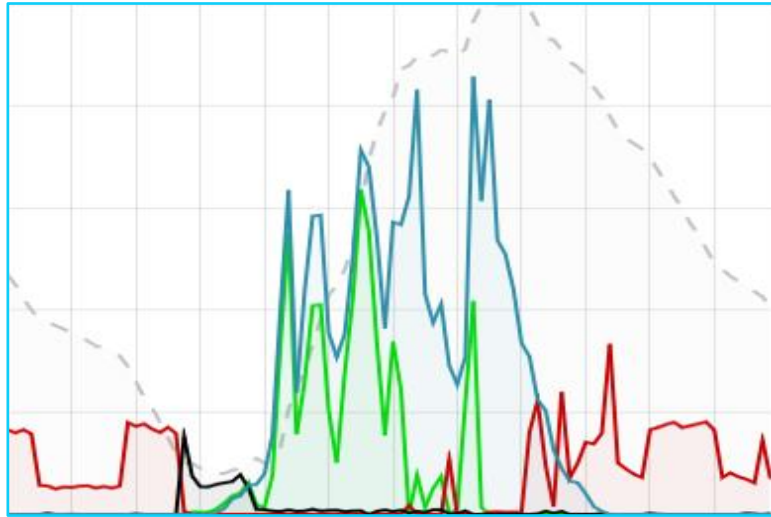
In average **excess batteries (>5%)**



From System to Intelligence

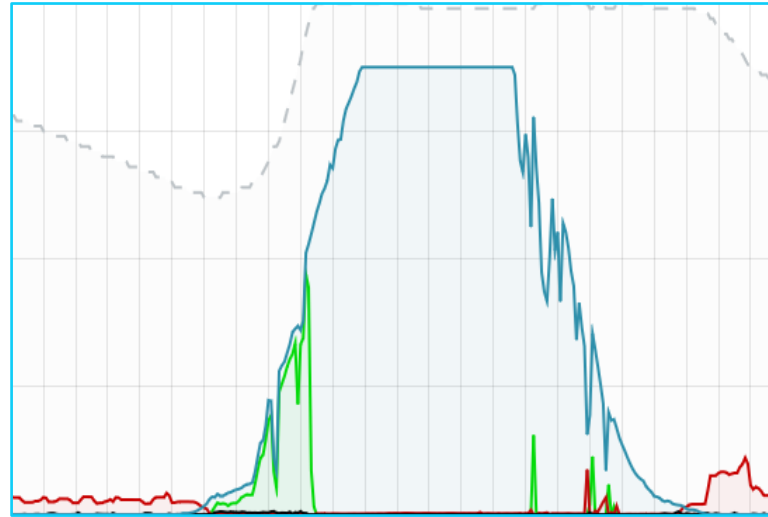
24/7/365 Holistic Cost Optimization Across
All Seasons and Sectors

„Naive self-consumption optimization“: from spring to summer to winter



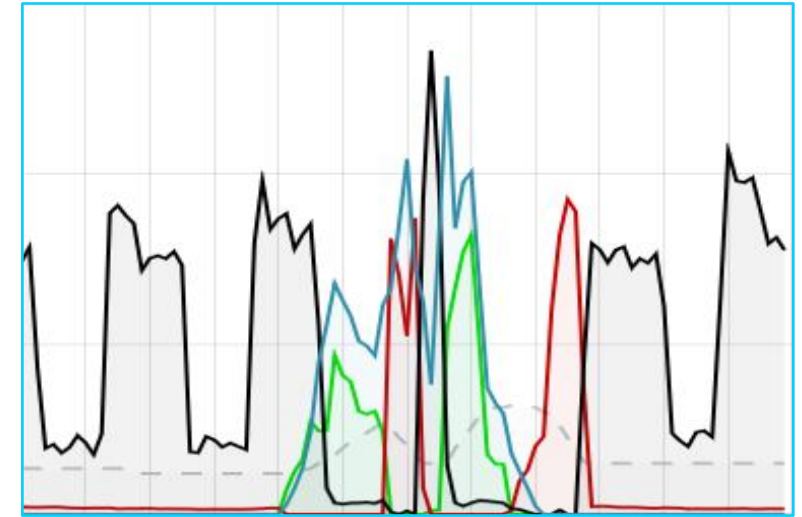
Late spring/Late autumn

- Perfectly expected behaviour



Summer

- Battery is hardly used
- Grid overload
- PV curtailment



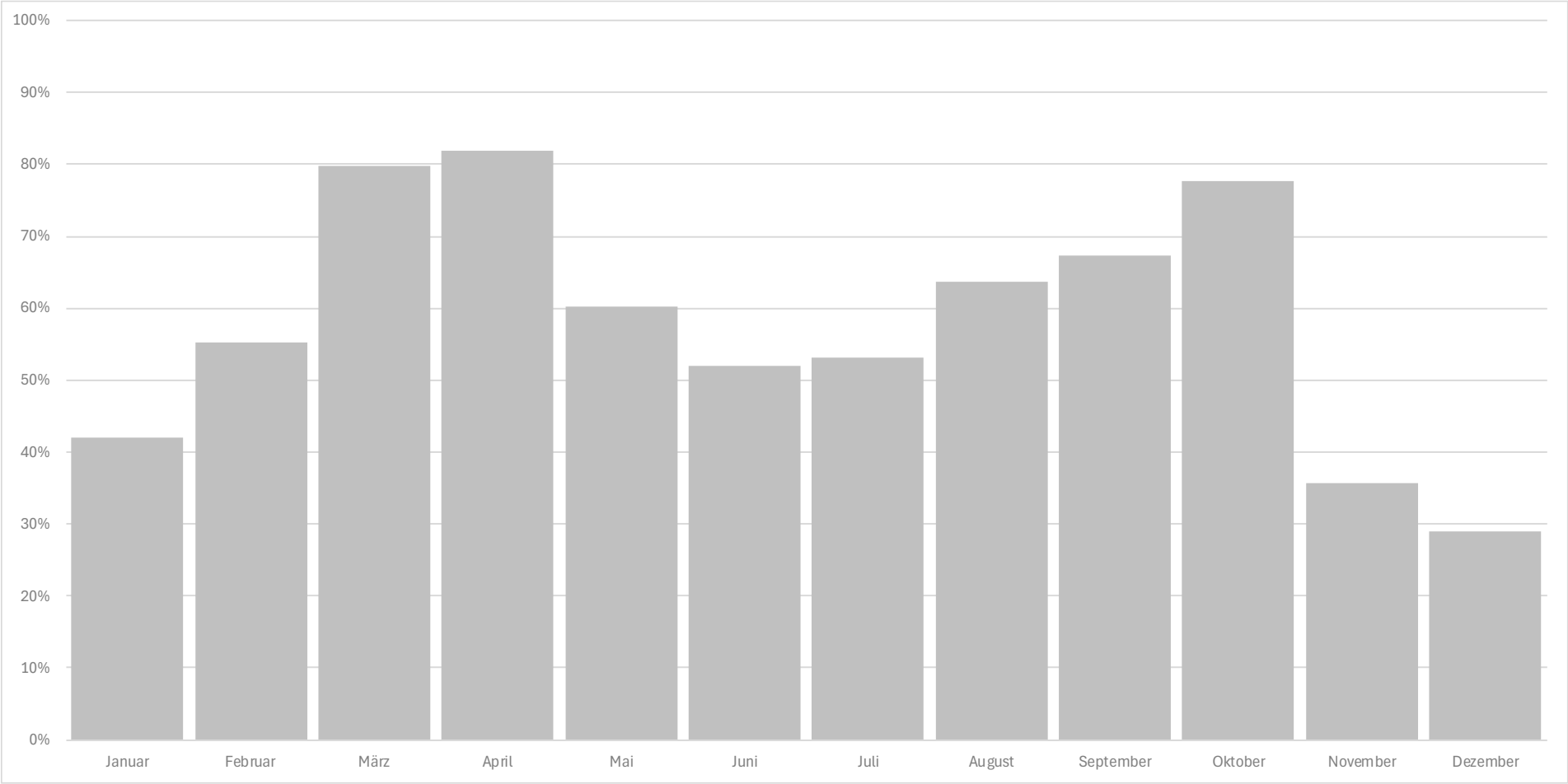
Winter

- Battery is hardly used
- Residual grid supply in the worst, most expensive hours

● Production
● Charge: ● Discharge
● Buy ● Sell
○ State of charge

Naive self-consumption optimization

Available capacity is only partly used

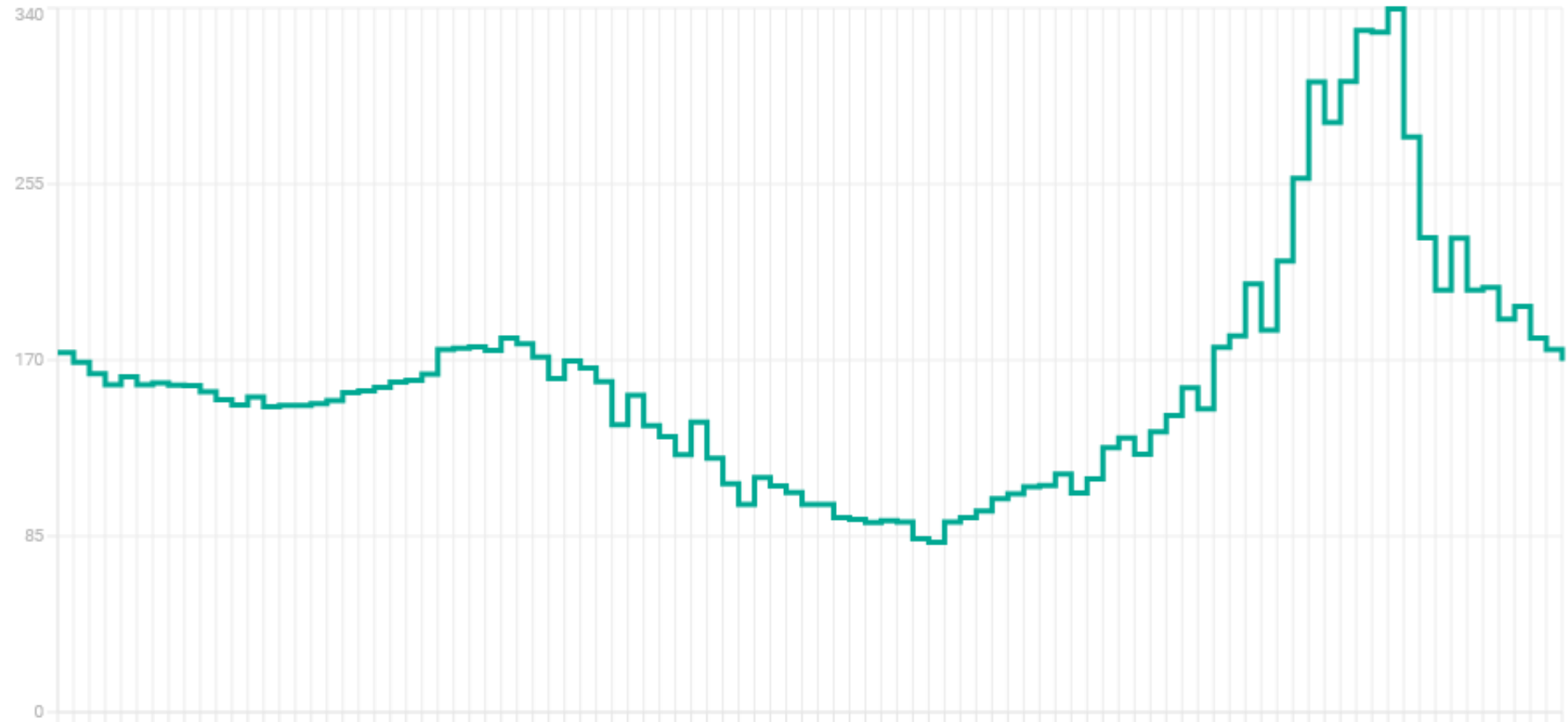


Systeme: 10 kWp South-facing PV | 8,8 kWh battery | naive self-consumption



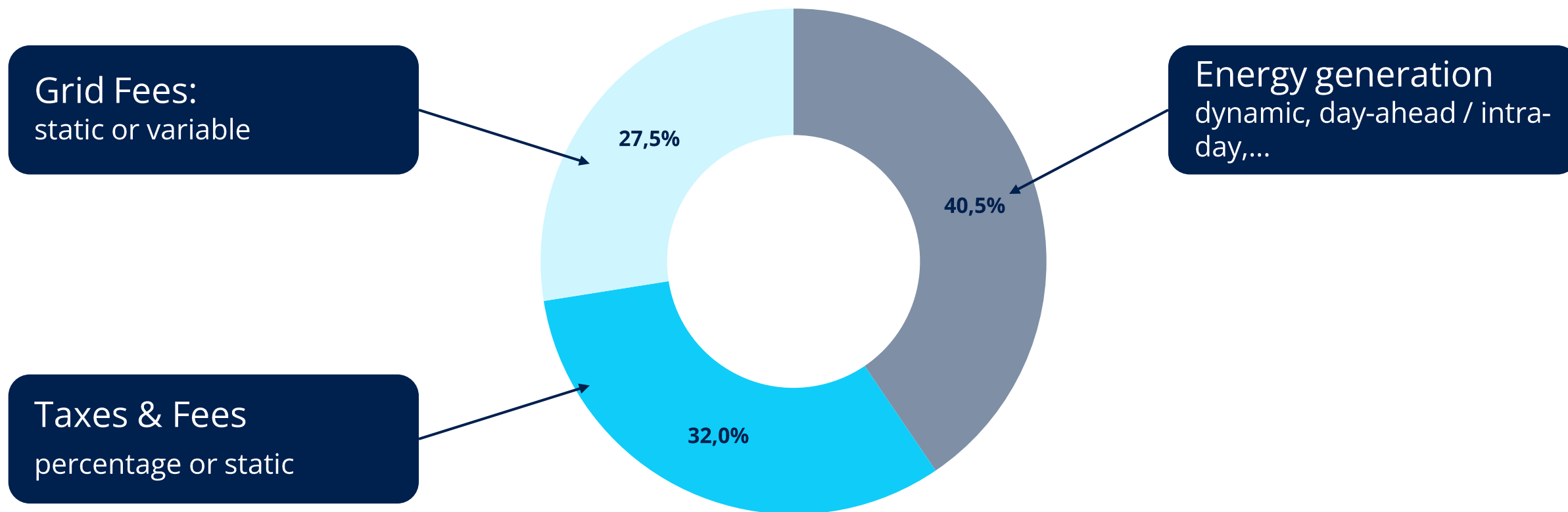
Prices (DE_LU) 16.07.2026

- Min: 8.5 €Ct./kWh
- Max: 34 €Ct./kWh
- Storage:
 - approx. 3 to 7 €Ct./kWh

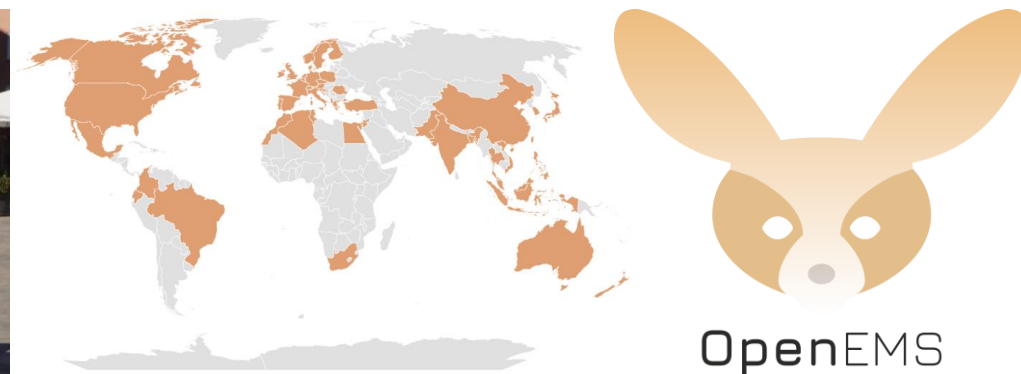


<https://transparency.entsoe.eu/market/energyPrices>

Gross energy prices

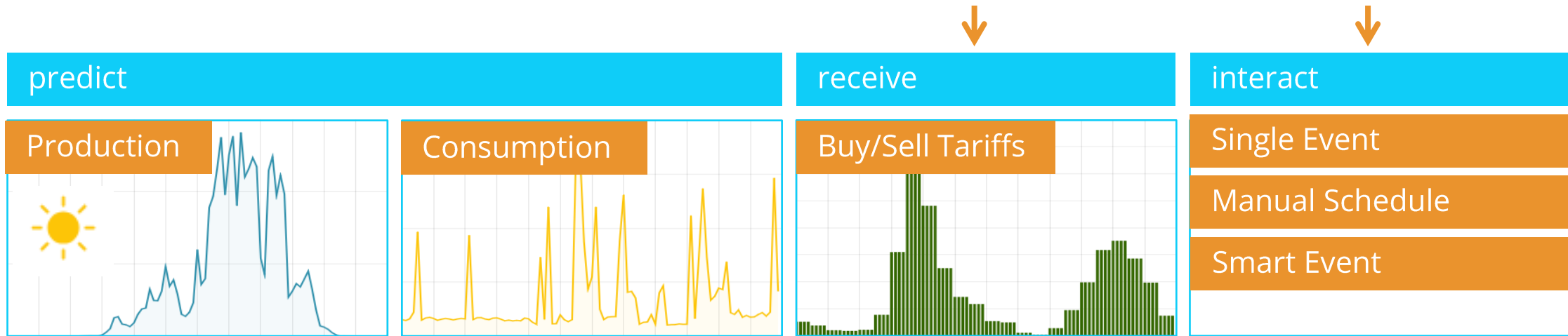


Open Collaboration with the global OpenEMS Community lead to...



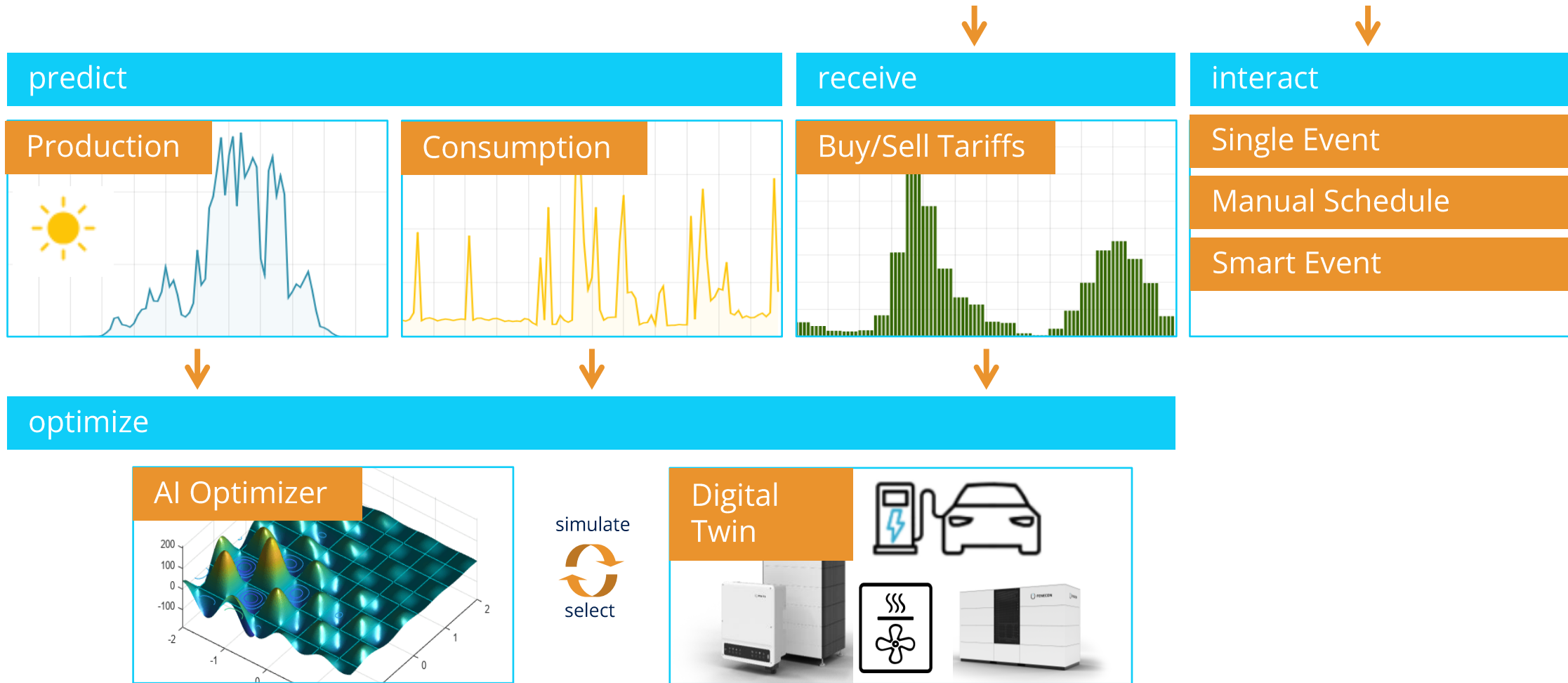
...the OpenEMS Energy Schedule

Holistic multi-objective cost optimization for a Energy Schedule across all sectors, combined with real-time control



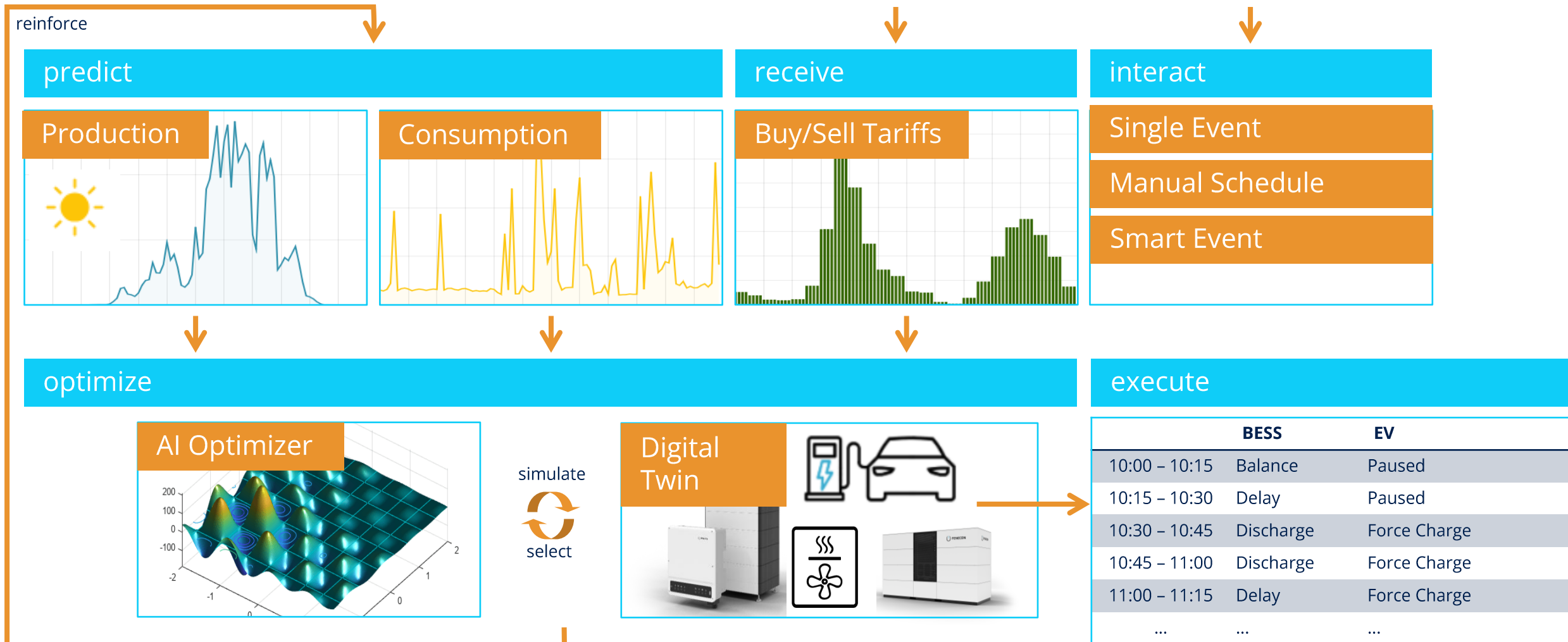
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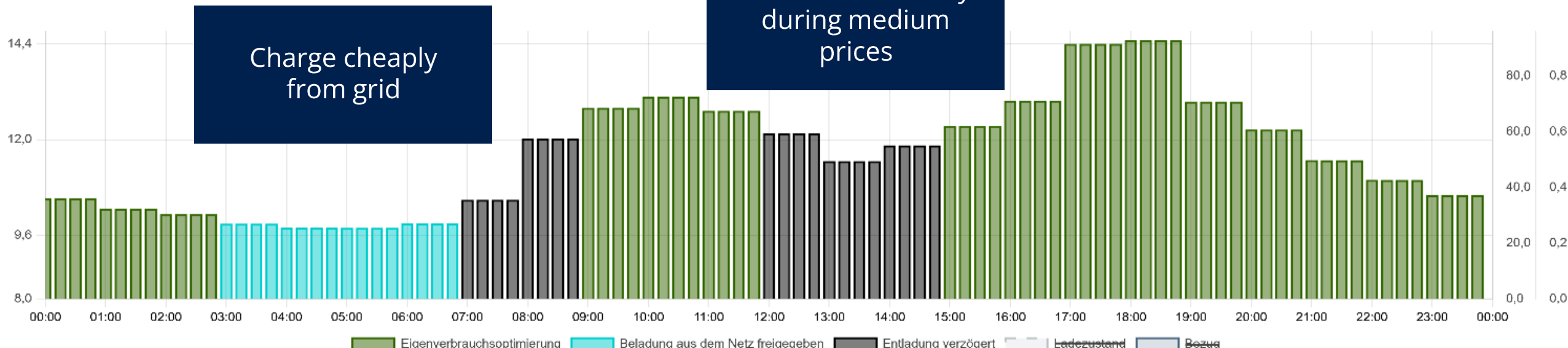
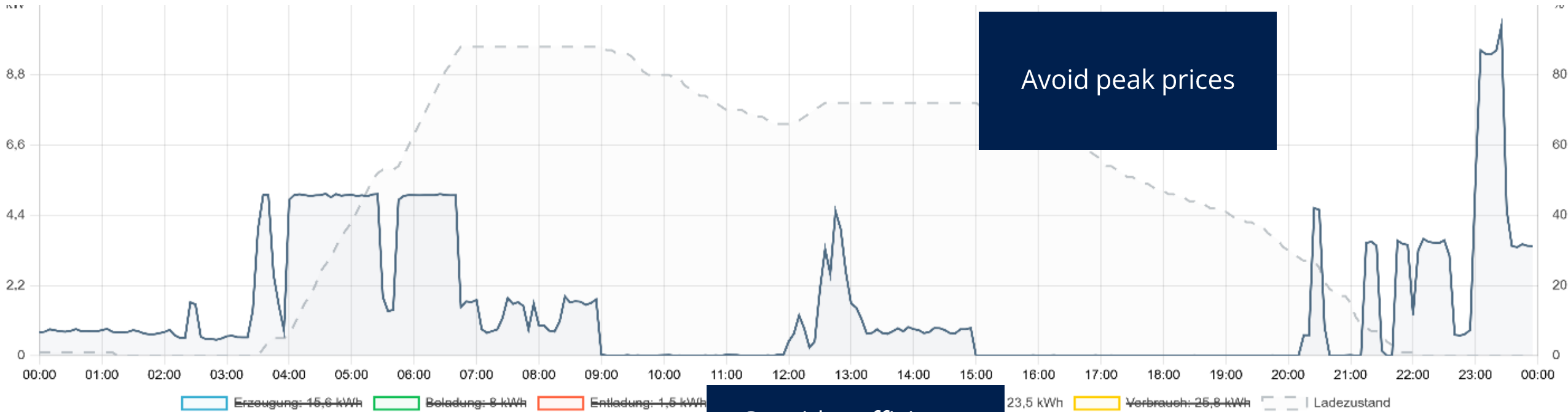


...the OpenEMS Energy Schedule

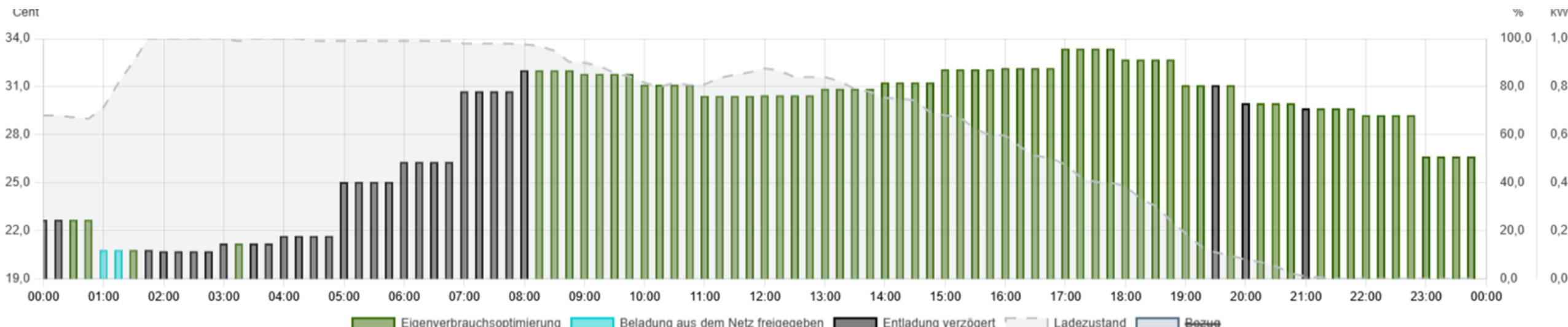
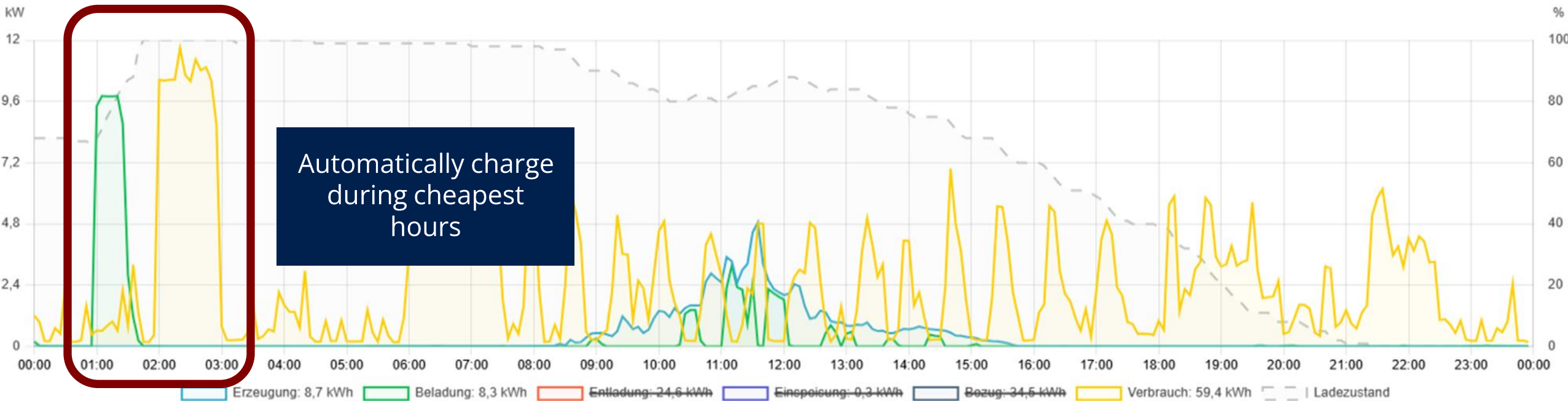
Holistic multi-objective cost optimization for a Energy Schedule across all sectors, combined with real-time control



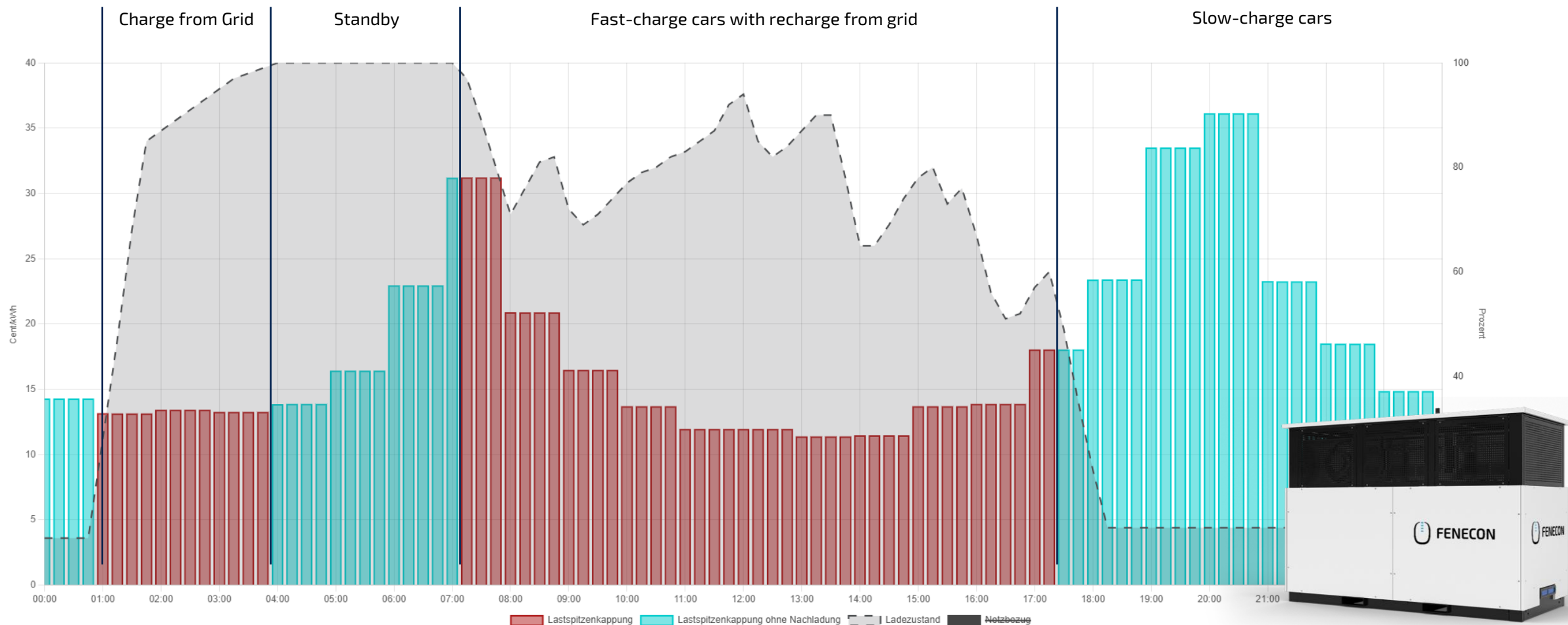
Winter Mode: smart charge BESS from Grid (productive since 2023)



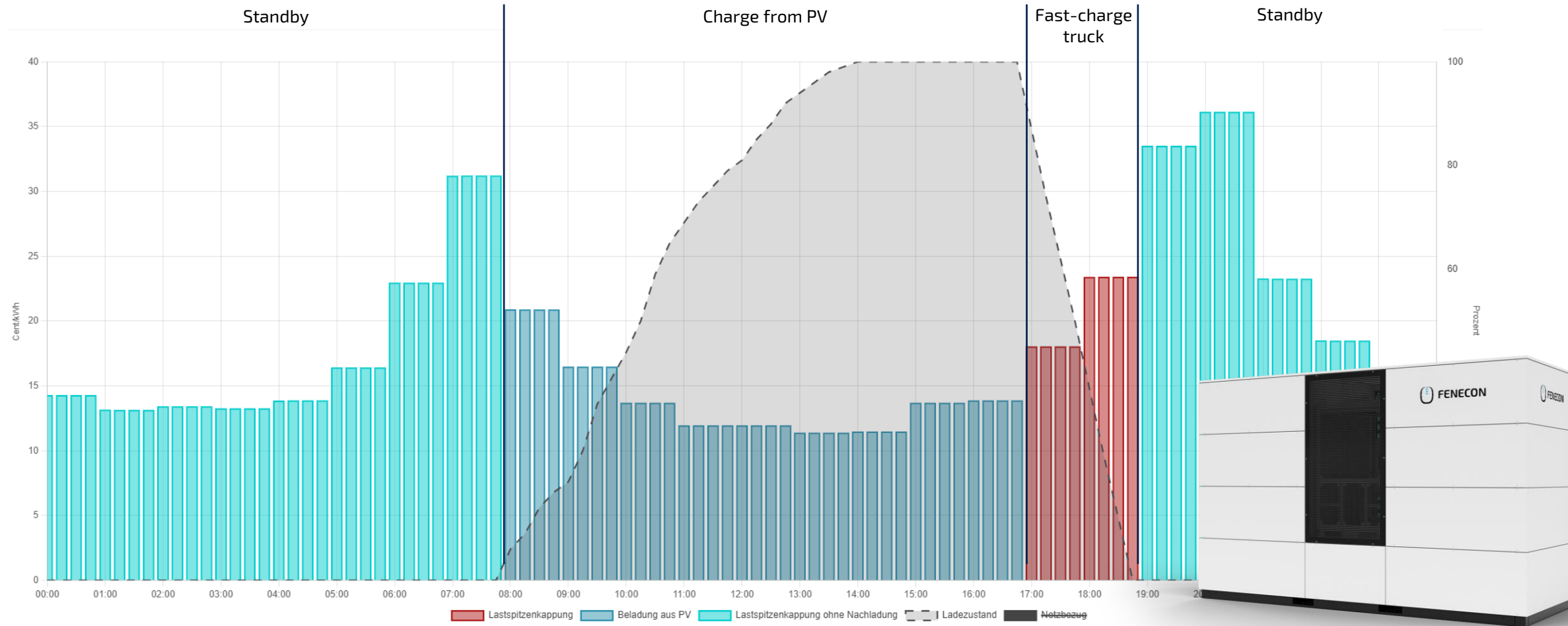
Add EVs to the game



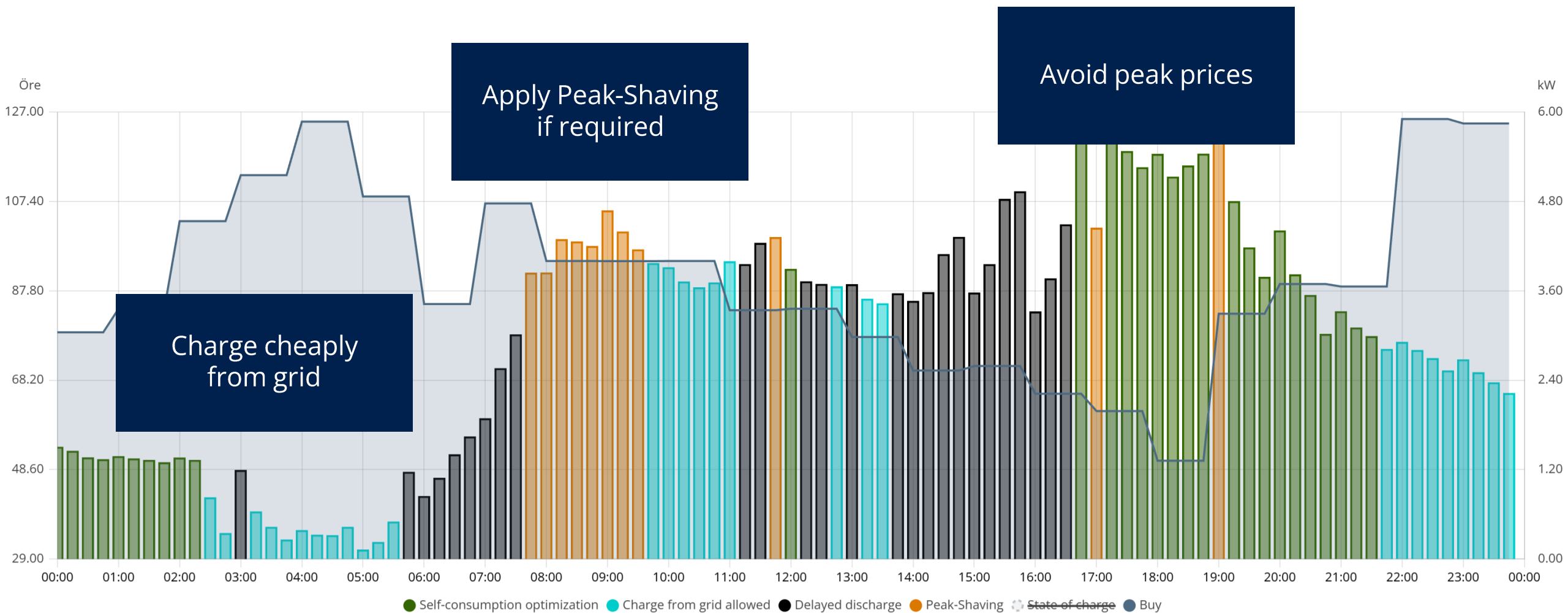
Company Fleet charging: Maximize power with lowest grid costs

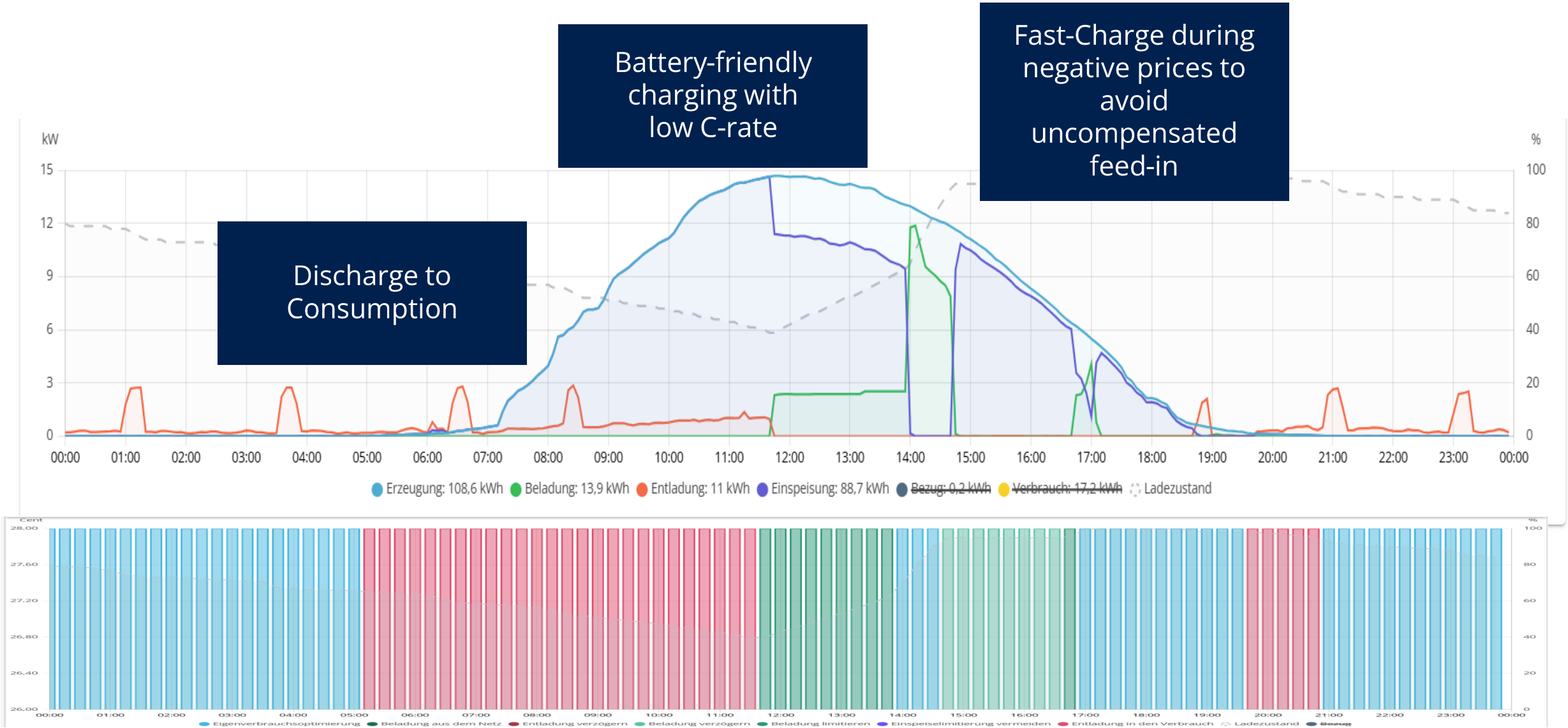


Truck Depot charging: Fast-Charging with PV and Time-of-Use pricing



Optimize for time-dependent Peak-Power-Prices





As systems become more complex UI/UX must be radically simplified

- Welcome FENA – FENECON Assistant
- No complex charts and numbers,
just simple words that explain what is going on...



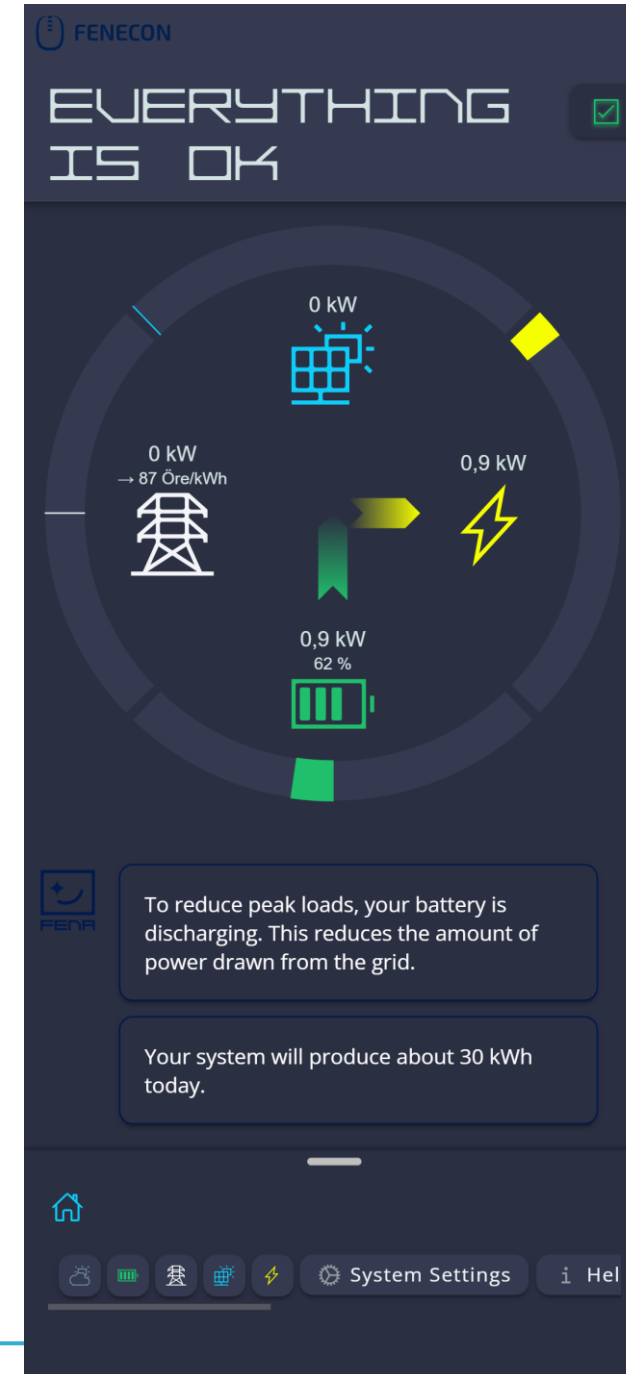
Your electric vehicle is being charged at the lowest possible cost so that you can depart at 7:00 with a full battery.

ADJUST SMART EVENT

DO NOT CHARGE TODAY

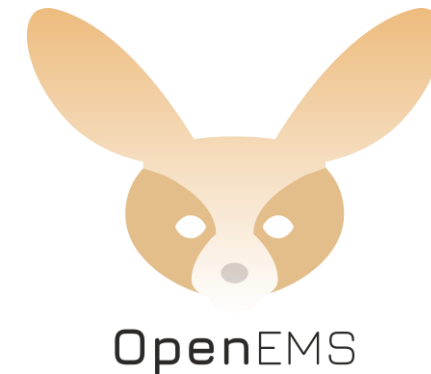
From 11:00, prices on the electricity market turn negative. Your battery system attempts to create sufficient free capacity by discharging into on-site consumers so that you can avoid feeding electricity into the grid during this period.

Your domestic water supply has reached 60 °C. Your heating element is running at zero cost today thanks to surplus solar energy and negative electricity market prices!



Your choice on industry leading EMS and BESS integration

- Made in Germany
- BESS and EMS from one single supplier
- Technical support and service team
- Lifetime software updates free of charge
- Open Data (Like we did with Uni Passau before
https://openenergyplatform.org/database/tables/emsig_energy_data_by_ems)
- the Operating System for the Energy Transition
- Open-Source and free-of-charge
- Useful for laboratory tests, final thesis, etc.
- Thriving global community



www.openems.io

THANK YOU