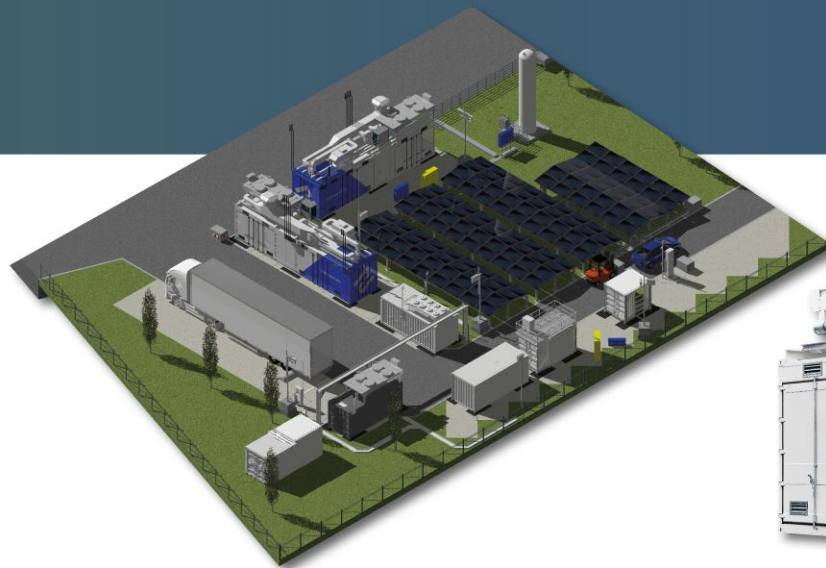
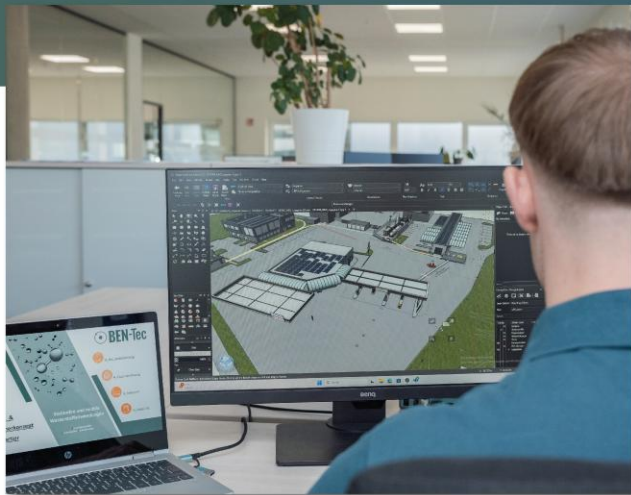




„Making renewable energy surplus efficiently usable.“



Combining Hydrogen and E-Mobility: Energy Habitats for Sector Coupling and Grid Stability



Nico Gerweler
Prokurist & Projektingenieur
n.gerweler@ben-tec.com
05971 / 99 198-19



Time problem

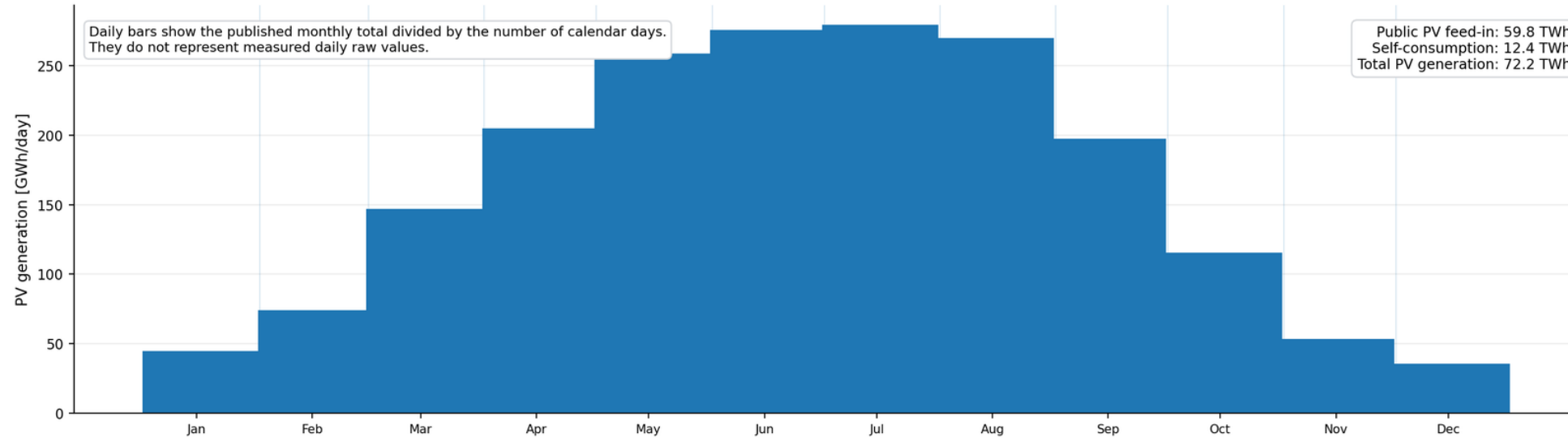
Energy from renewable sources $\neq$ 'energy demand'



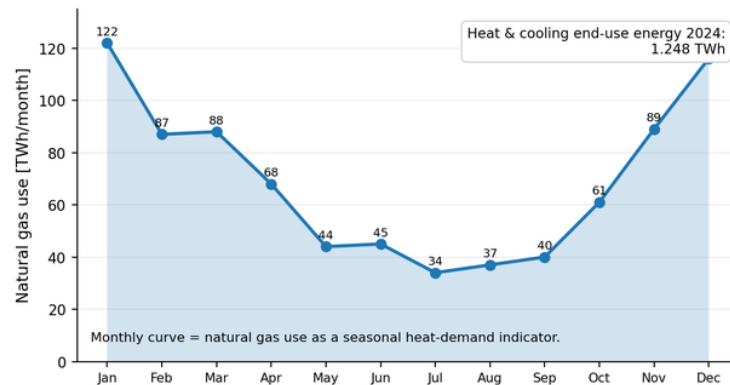
BEN-Tec



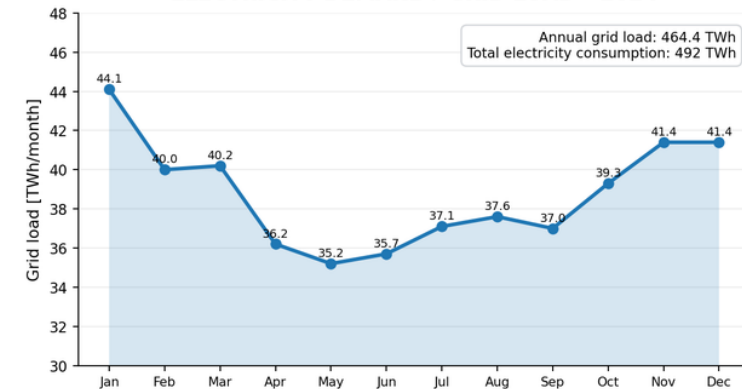
PHOTOVOLTAICS - DAILY-RESOLUTION VIEW 2024



HEAT - SEASONAL PROFILE 2024

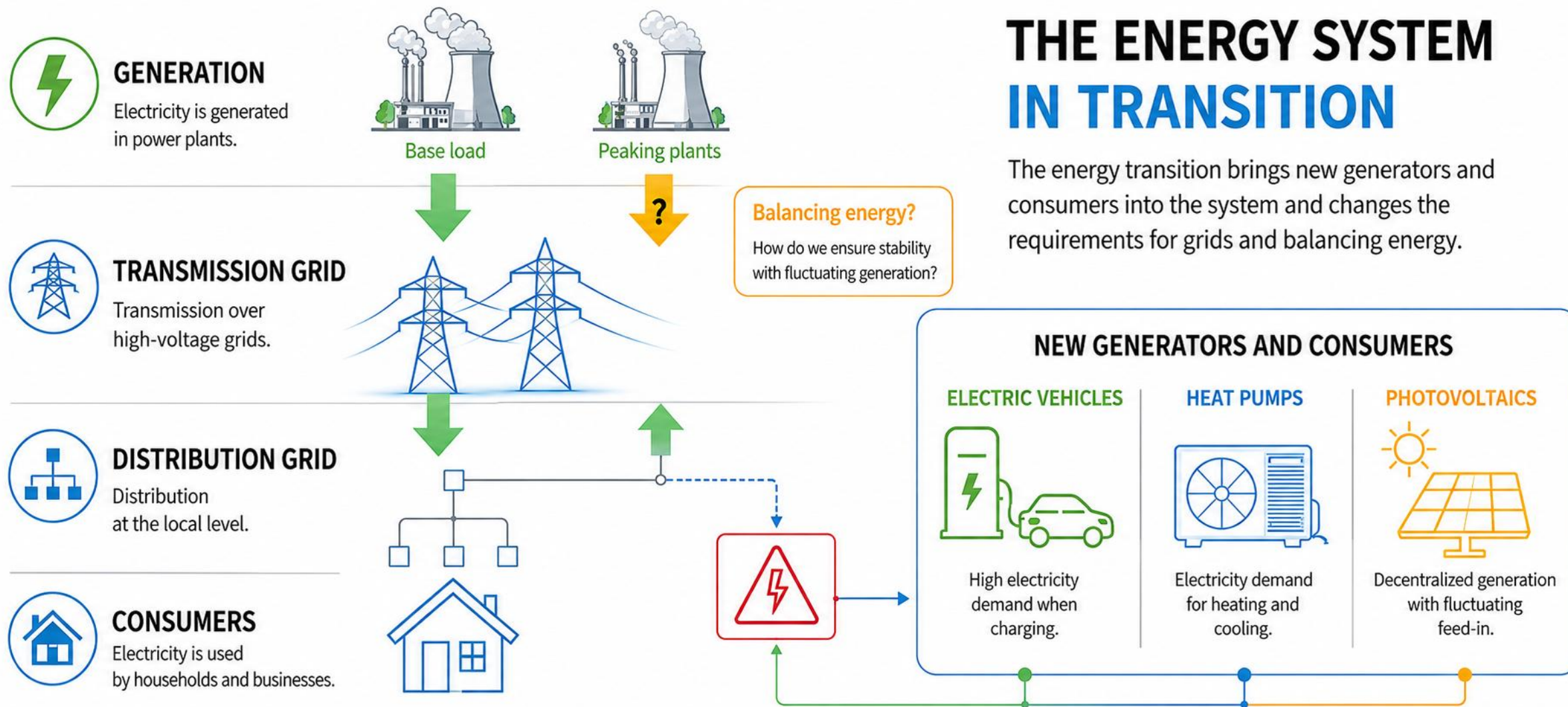


ELECTRICITY DEMAND / GRID LOAD - 2024



Time problem

Energy from renewable sources $\neq$ 'energy demand'



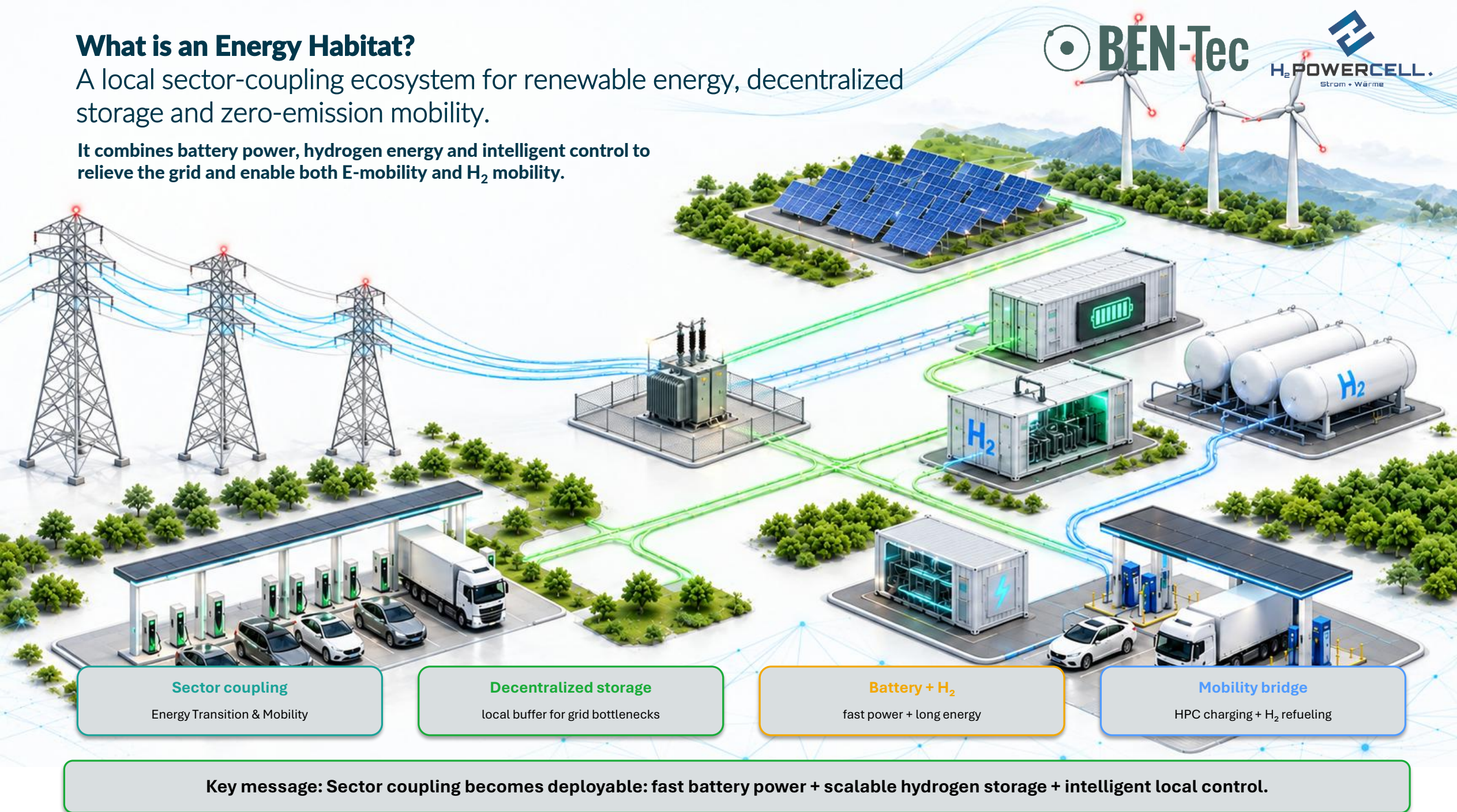
THE ENERGY SYSTEM IN TRANSITION

The energy transition brings new generators and consumers into the system and changes the requirements for grids and balancing energy.

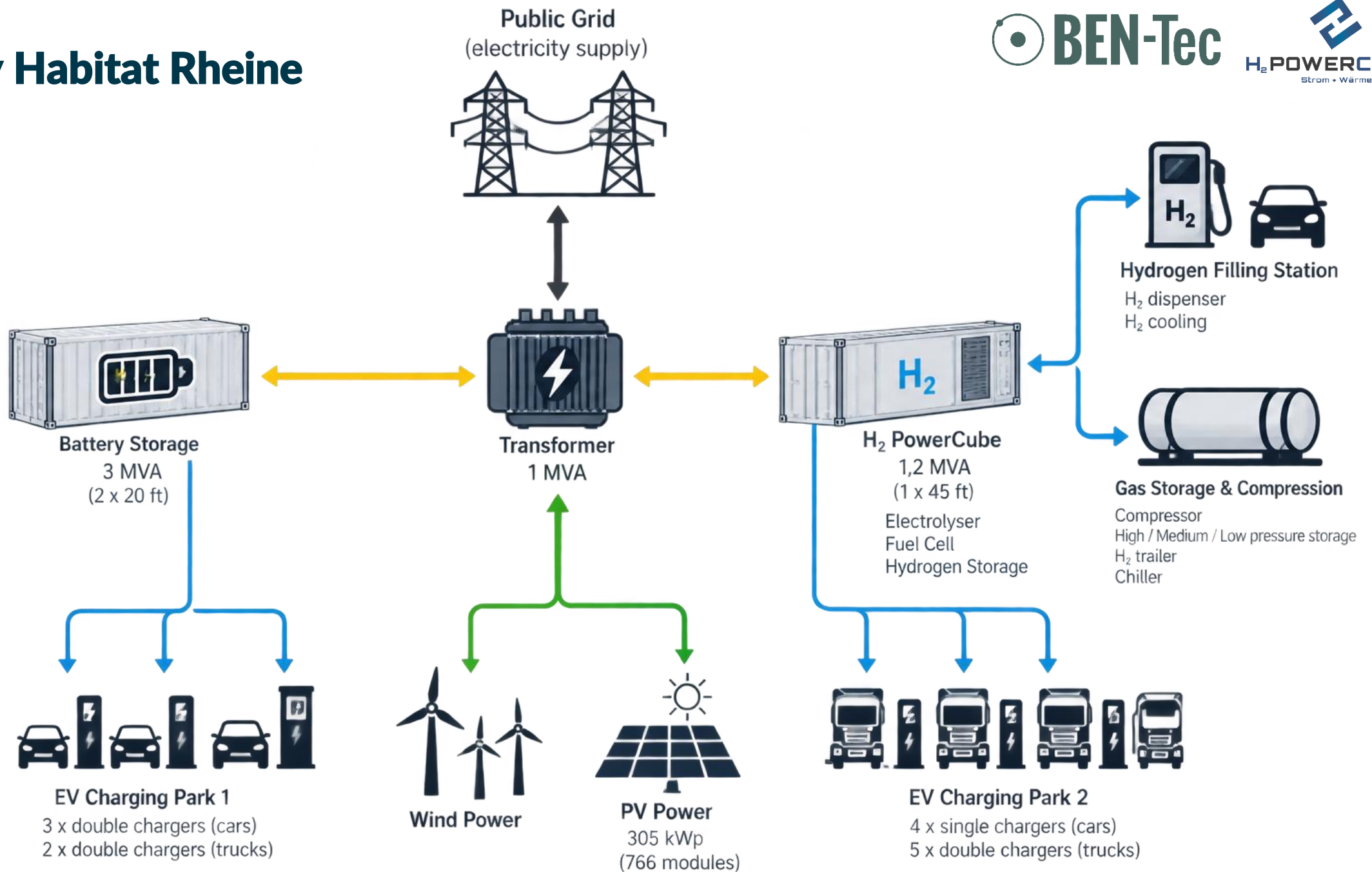
What is an Energy Habitat?

A local sector-coupling ecosystem for renewable energy, decentralized storage and zero-emission mobility.

It combines battery power, hydrogen energy and intelligent control to relieve the grid and enable both E-mobility and H₂ mobility.



Energy Habitat Rheine



H₂PowerLyzer – PEM Electrolyzer

	H ₂ PowerLyzer 40	H ₂ PowerLyzer 120
Installed El. Power	48 kW	144 kW
Hydrogen Production	0,68 kg/h	0,68...2,04 kg/h
Load Range	20...100%	
H ₂ Output Pressure	≤ 40 bar	
Power Demand BoP	7 kW	21 kW
Voltage Supply	400 VAC / 50 Hz	
Control Interface	Modbus TCP, Ethernet	



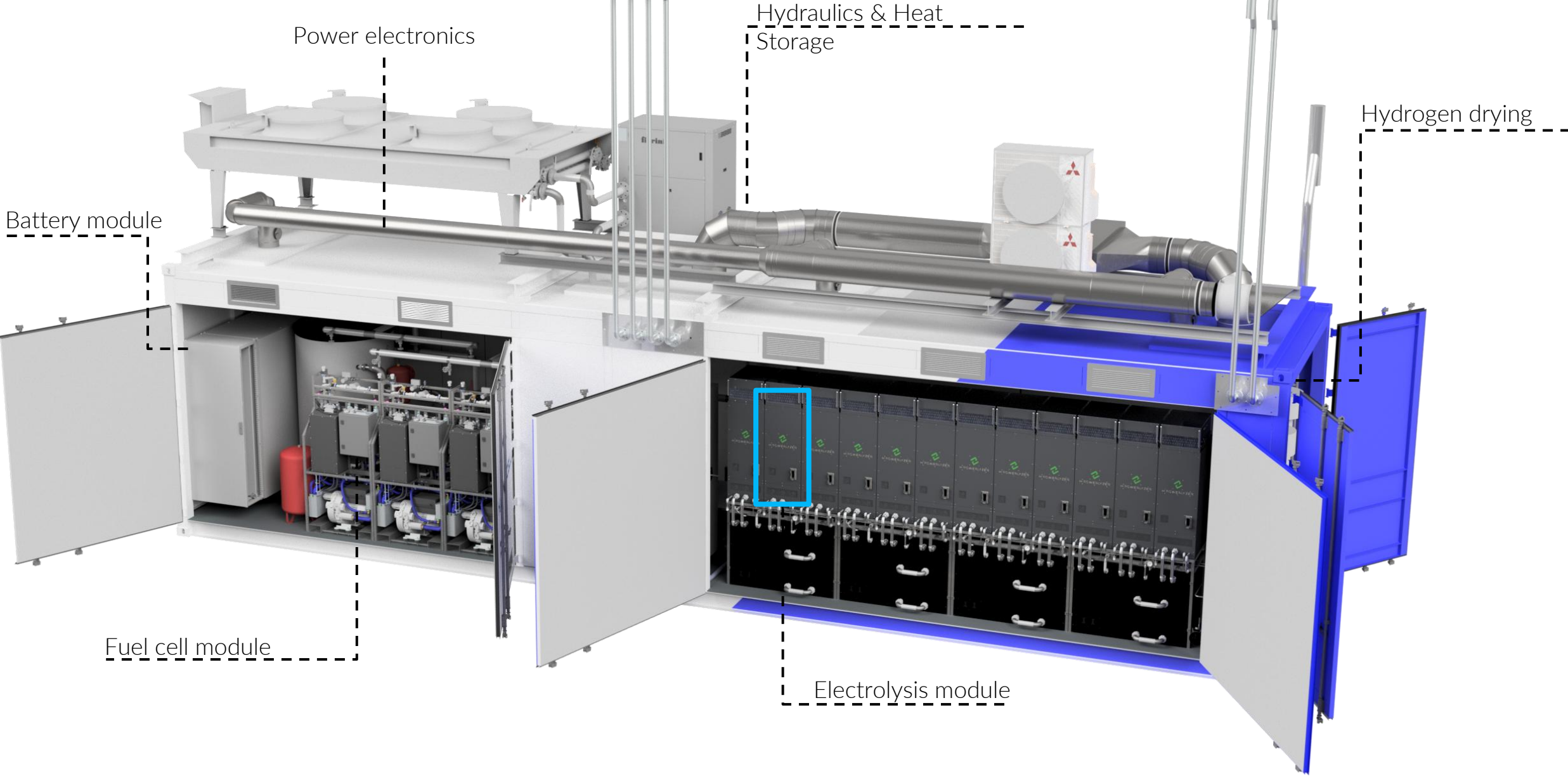
Product Scope:

- Power Electronics
- Electrolyzer
- System Controller
- Water & Cooling Unit

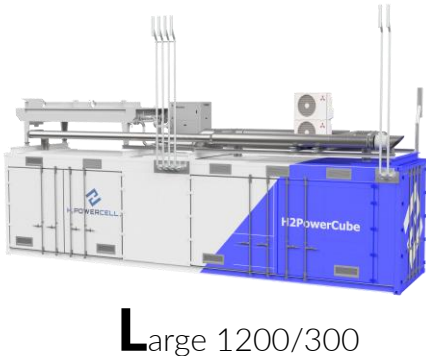
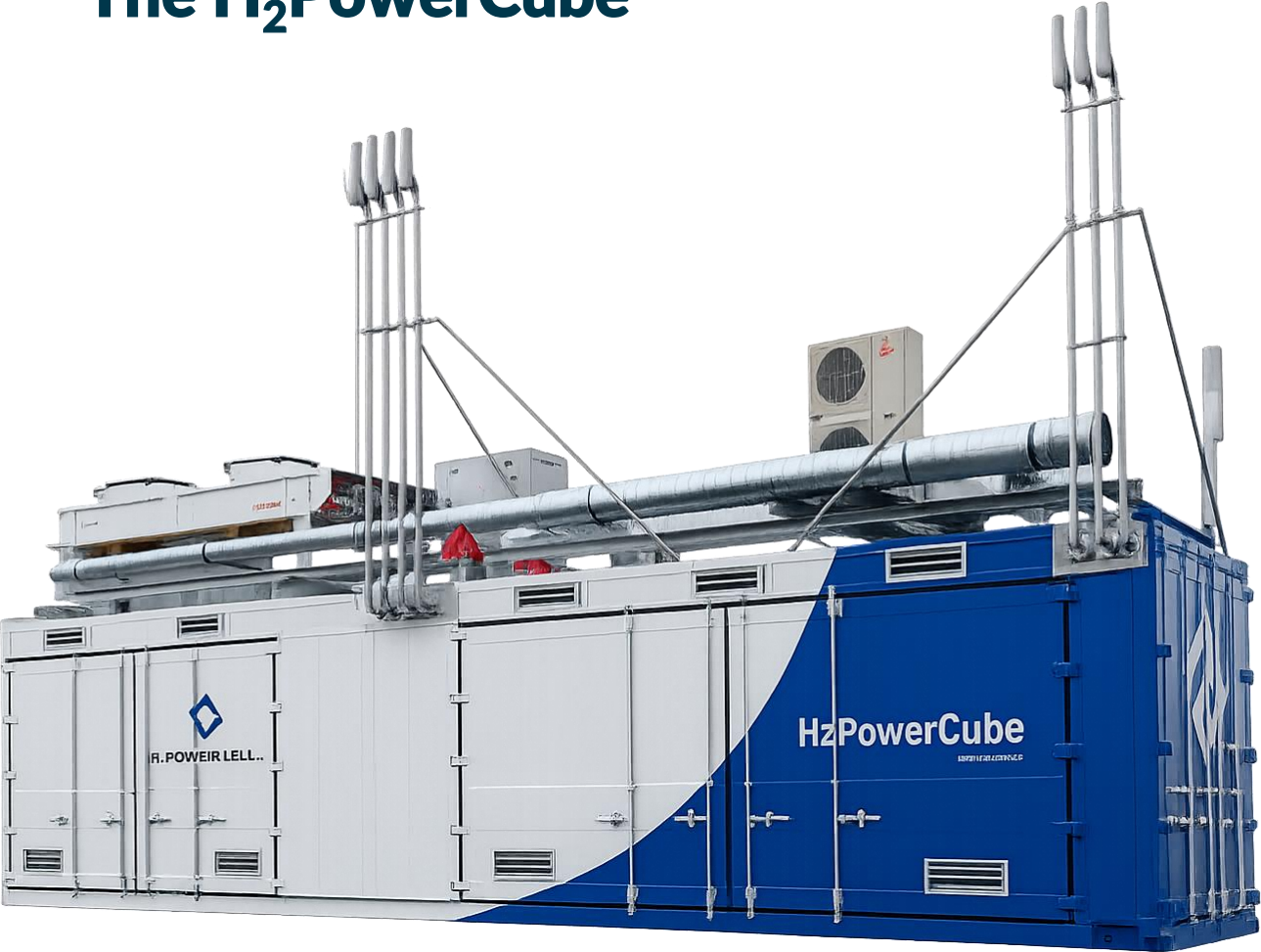
Optional Scope:

- Hydrogen Purification
- Water Purification
- Control Cabinet

H₂PowerCube



The H₂PowerCube





Notstromfähig



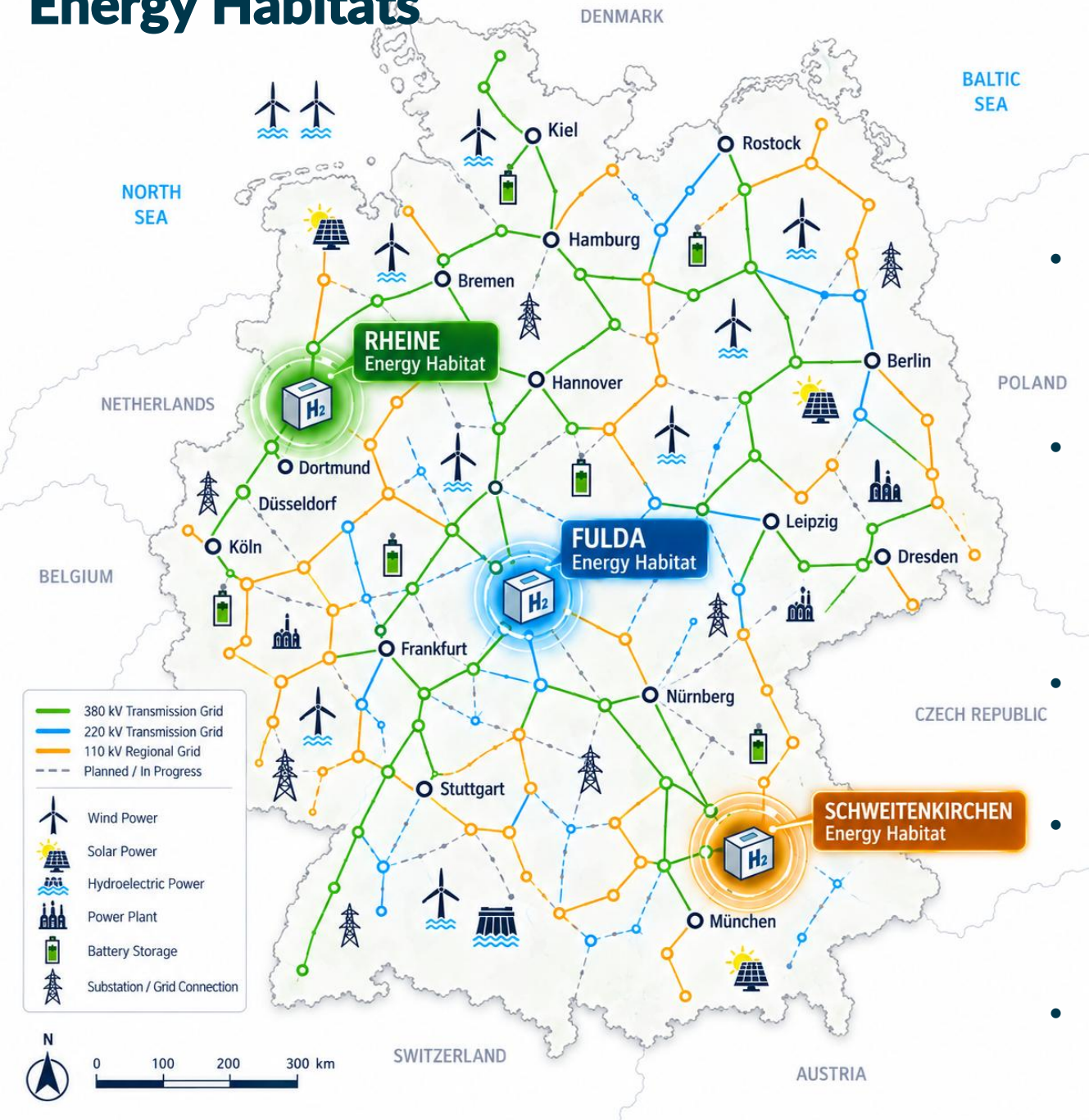
Schwarzstartfähig



Netzstabilisierung

	H ₂ PowerCube		
Type	S	M	L
Container Size	10 Feet	20 Feet	45 Feet
Installed ELY Power	48 kW	48...144 kW	144...1.152 kW
Hydrogen Production	0,68 kg/h	0,68...2,04 kg/h	0,68...16,32 kg/h
H2 Output Pressure	≤ 40 bar		
Installed FC Power	up to 16 kW _{el}	up to 300 kW _{el}	
Battery Size	10 kWh / 10 kW	50 kWh / 200 kW	
Voltage In-/Output	400 VAC		

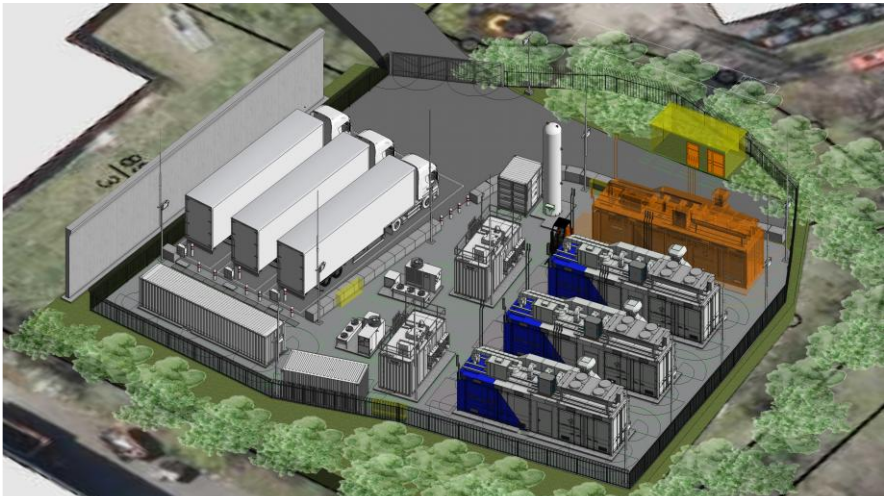
Energy Habitats



- Expanding Renewable Energy Without Waiting for Grid Expansion
- Expanding Sustainable Mobility Despite Insufficient Network Capacity
- Energy storage where it will be needed later
- Making Our Grids More Resilient Through Decentralized Storage
- Creating Local Value



Energy Habitats - Fulda



EMS-system

Übersicht

Energieflüsse

Anlagen

Speicher

Verbraucher

Märkte

Analyse

Alarme

Einstellungen

Systemstatus
Alle Systeme normal

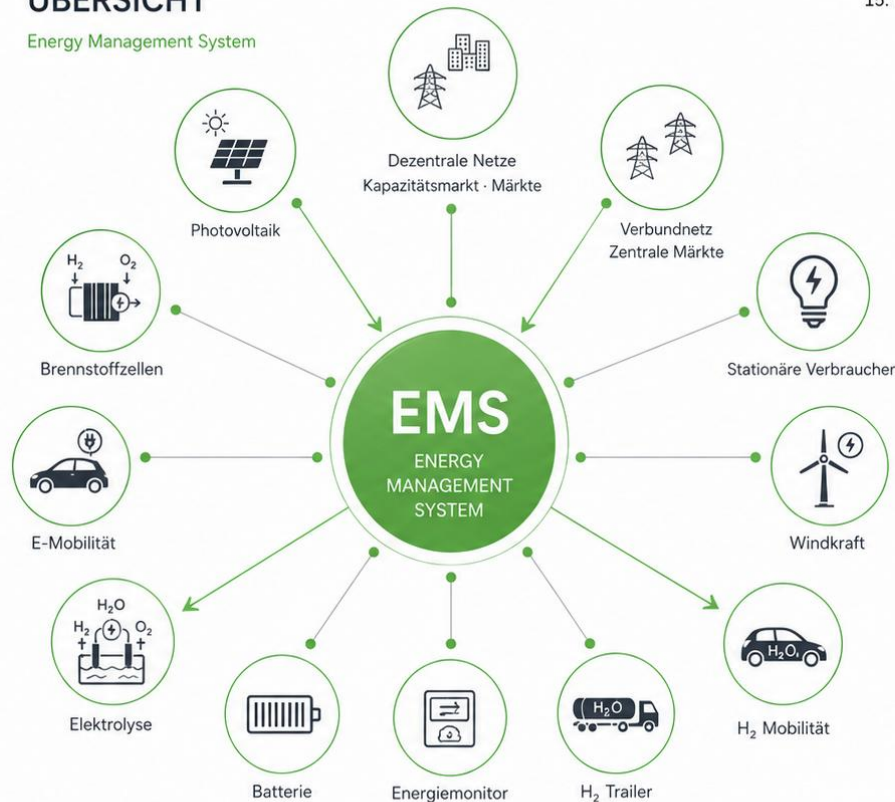
Administrator
admin@h2powercell.de

ÜBERSICHT

Energy Management System

15. Mai 2025 | 10:24

System OK



SYSTEMÜBERSICHT

	Gesamtproduktion 12,45 MW
	Gesamtverbrauch 9,87 MW
	Speicherstand 78 %
	Wasserstoffproduktion 4,32 kg/h
	CO ₂ Einsparung heute 2,45 t

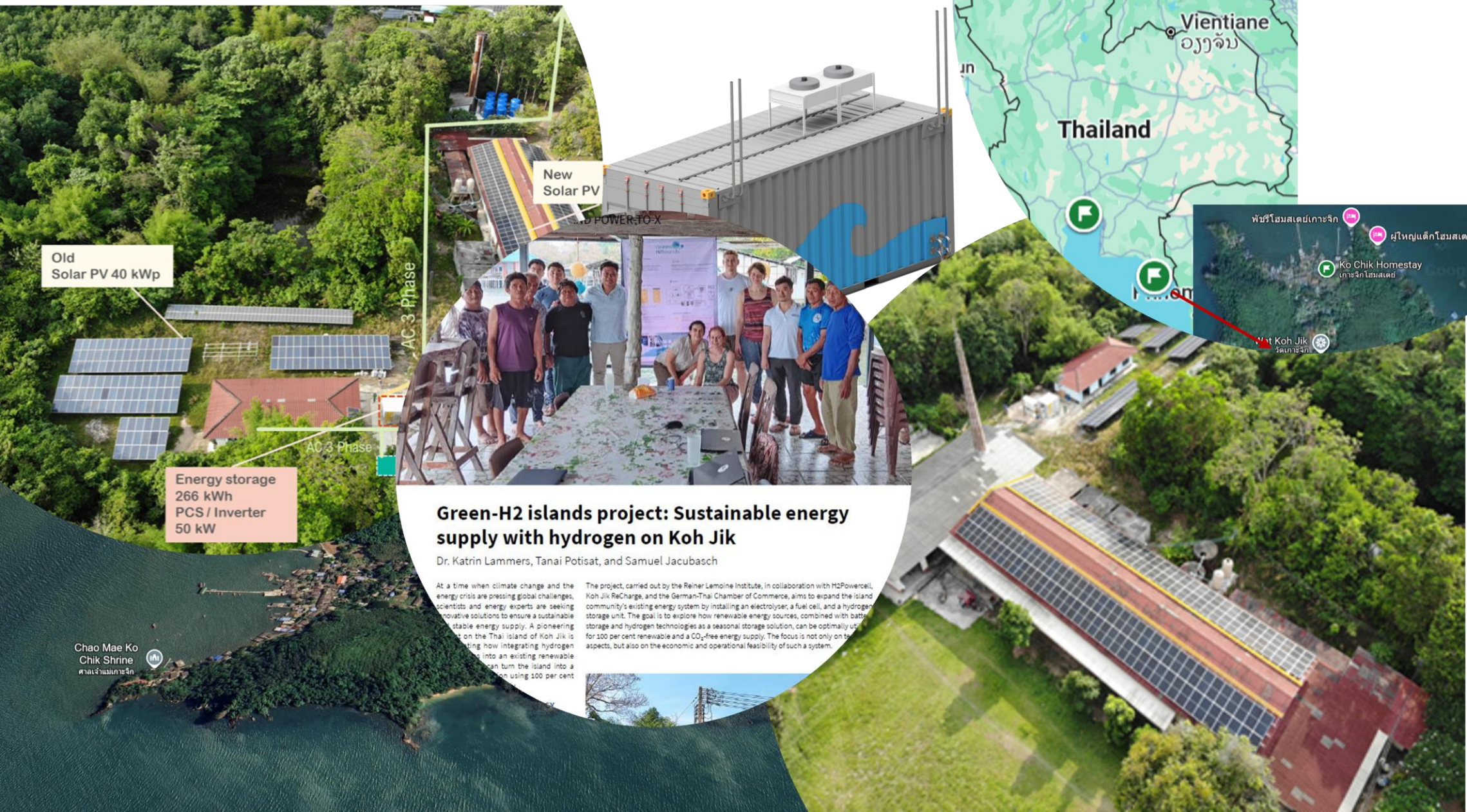
AKTUELLE ALARME

Keine aktiven Alarme

Stationary and mobile sector coupling as hybrid storage, based on technical and economic parameters

- Holistic controller for managing generation plants, battery storage systems, electrolyzers, fuel cells, electric vehicle charging points and grid-friendly operation
- Grid Resilience
- Modular Integration of Generation & Loads
- Network & Cyber Security

Projects



Old
Solar PV 40 kWp

New
Solar PV

Energy storage
266 kWh
PCS / Inverter
50 kW

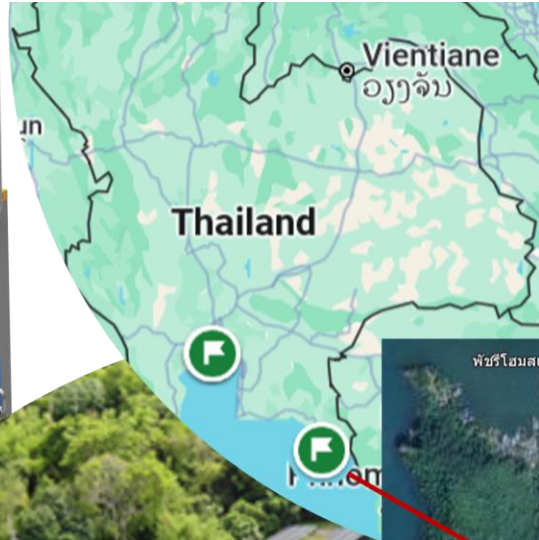
AC 3 Phase

Green-H2 islands project: Sustainable energy supply with hydrogen on Koh Jik

Dr. Katrin Lammers, Tanai Potisat, and Samuel Jacobasch

At a time when climate change and the energy crisis are pressing global challenges, scientists and energy experts are seeking innovative solutions to ensure a sustainable and stable energy supply. A pioneering project on the Thai island of Koh Jik is investigating how integrating hydrogen into an existing renewable energy system can turn the island into a 100 per cent green island using 100 per cent

The project, carried out by the Reiner Lemoine Institute, in collaboration with H2Powercell, Koh Jik ReCharge, and the German-Thai Chamber of Commerce, aims to expand the island community's existing energy system by installing an electrolyser, a fuel cell, and a hydrogen storage unit. The goal is to explore how renewable energy sources, combined with battery storage and hydrogen technologies as a seasonal storage solution, can be optimally utilized for 100 per cent renewable and a CO₂-free energy supply. The focus is not only on technical aspects, but also on the economic and operational feasibility of such a system.

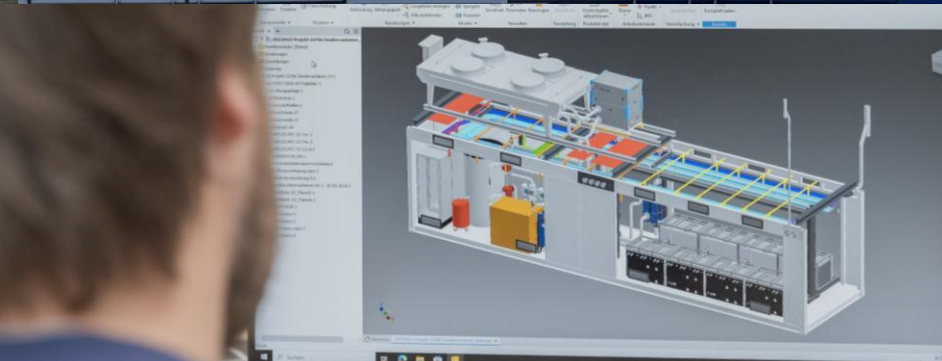


Chao Mae Ko
Chik Shrine
ศาลเจ้าแม่เกาะจิก



 **BEN-Tec**


H₂POWERCELL.
Strom + Wärme



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