

Realize
LIVE



Designing hydrogen at speed:

How H2 Core Systems cut production time with
Designcenter X Solid Edge

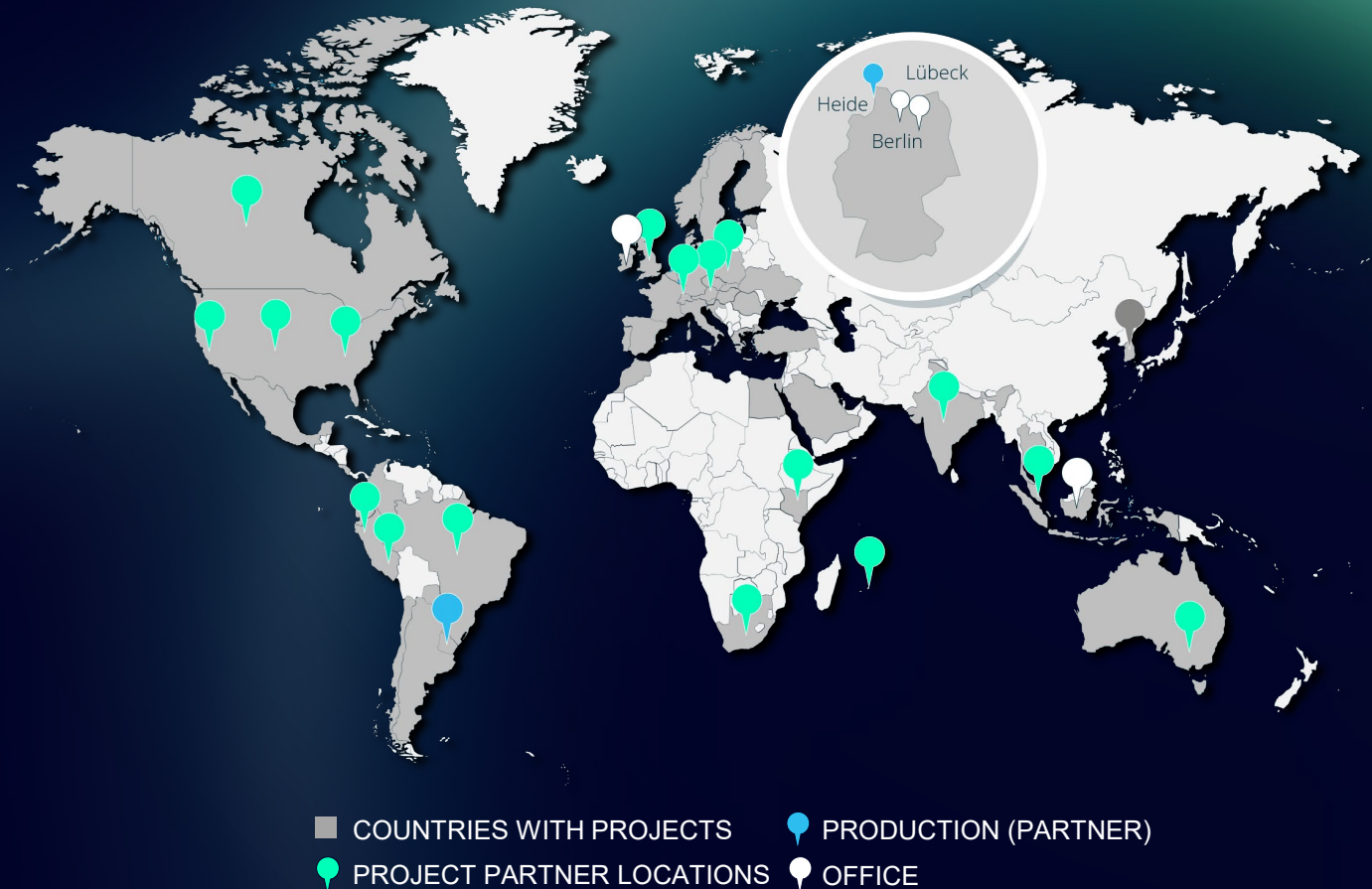
Thorsten Claußen

Head of Engineering

H2 Core Systems

About H2 Core Systems

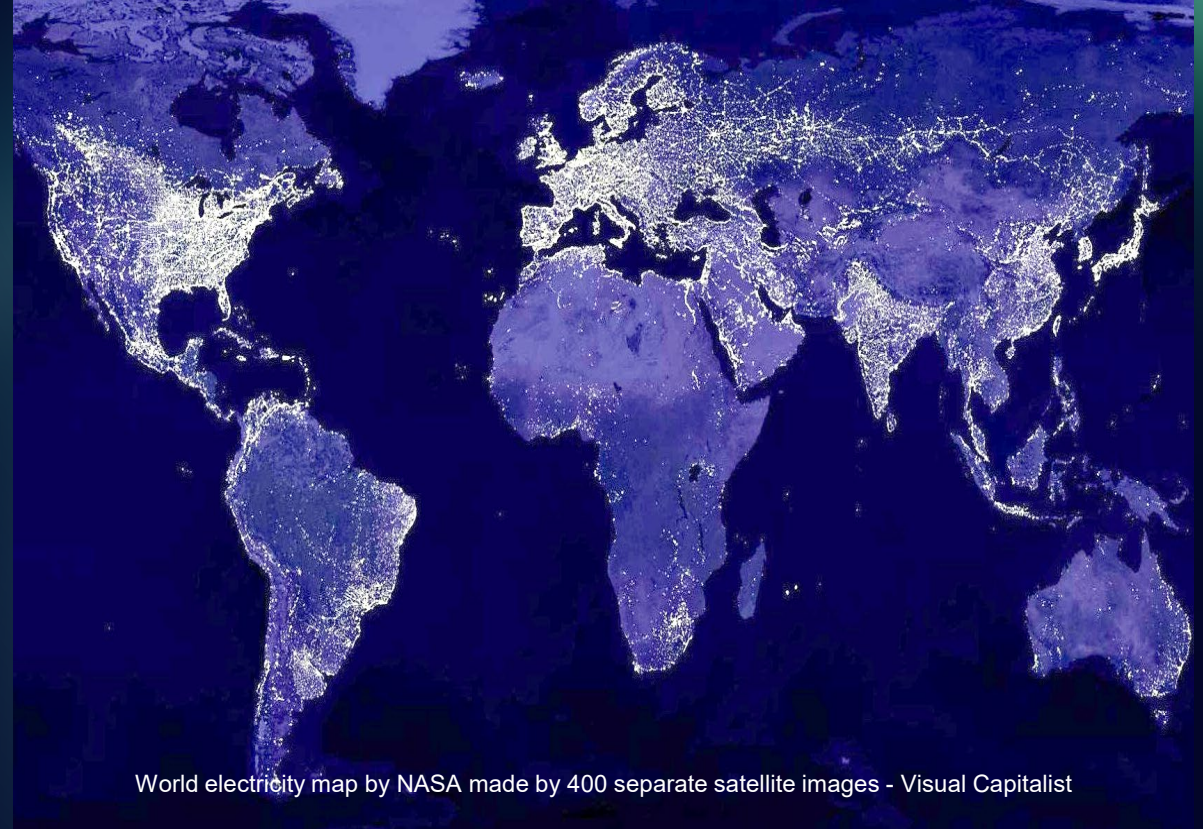
- Founded 2020 – Heide - Germany
- Manufacturer of hydrogen all-in-one energy systems & build partner
- For true sovereignty and independence from resources and prices
- We deliver the standard of the future: safe and economical
- > 300 Plug-and-play H2 systems built
> 40 countries > 50 project partners



The energy trilemma

Energy accessibility & affordability

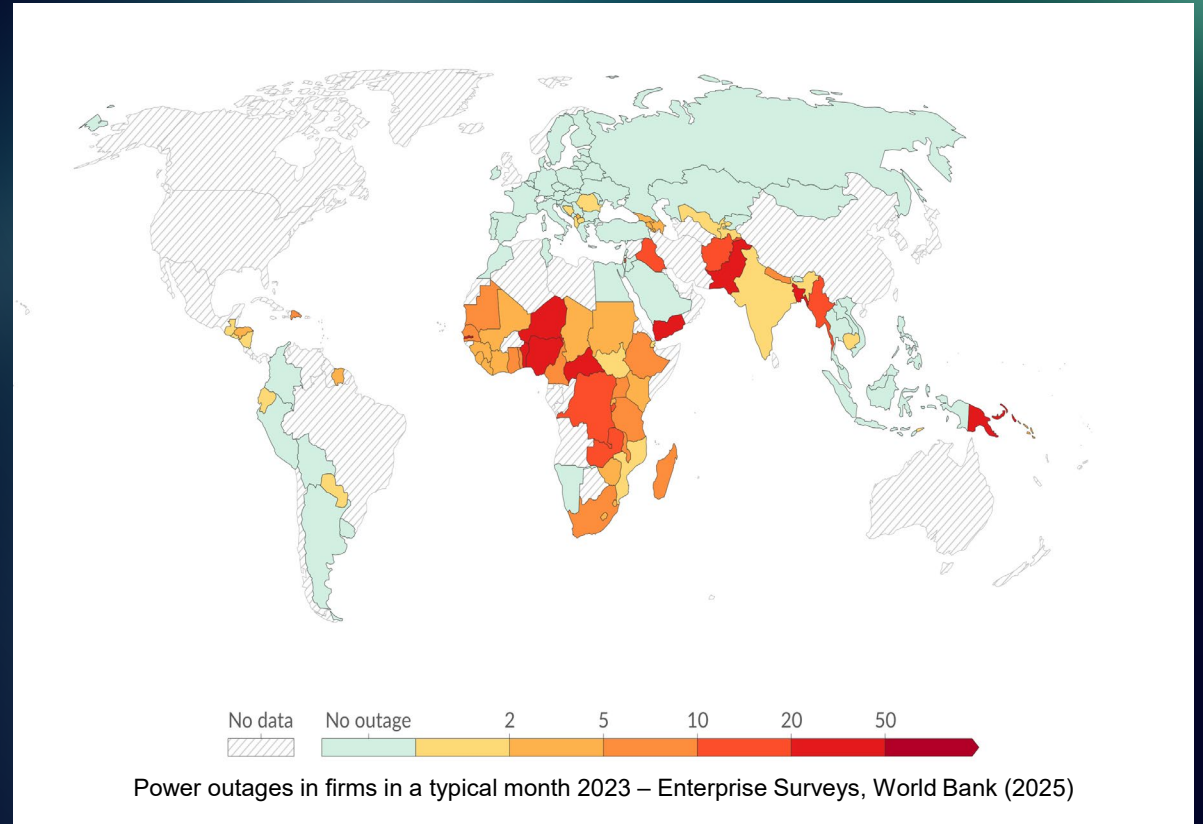
→ Critical energy infrastructure: **No-grid**



The energy trilemma

Energy accessibility & affordability

→ Critical energy infrastructure: No-grid / **bad-grid**

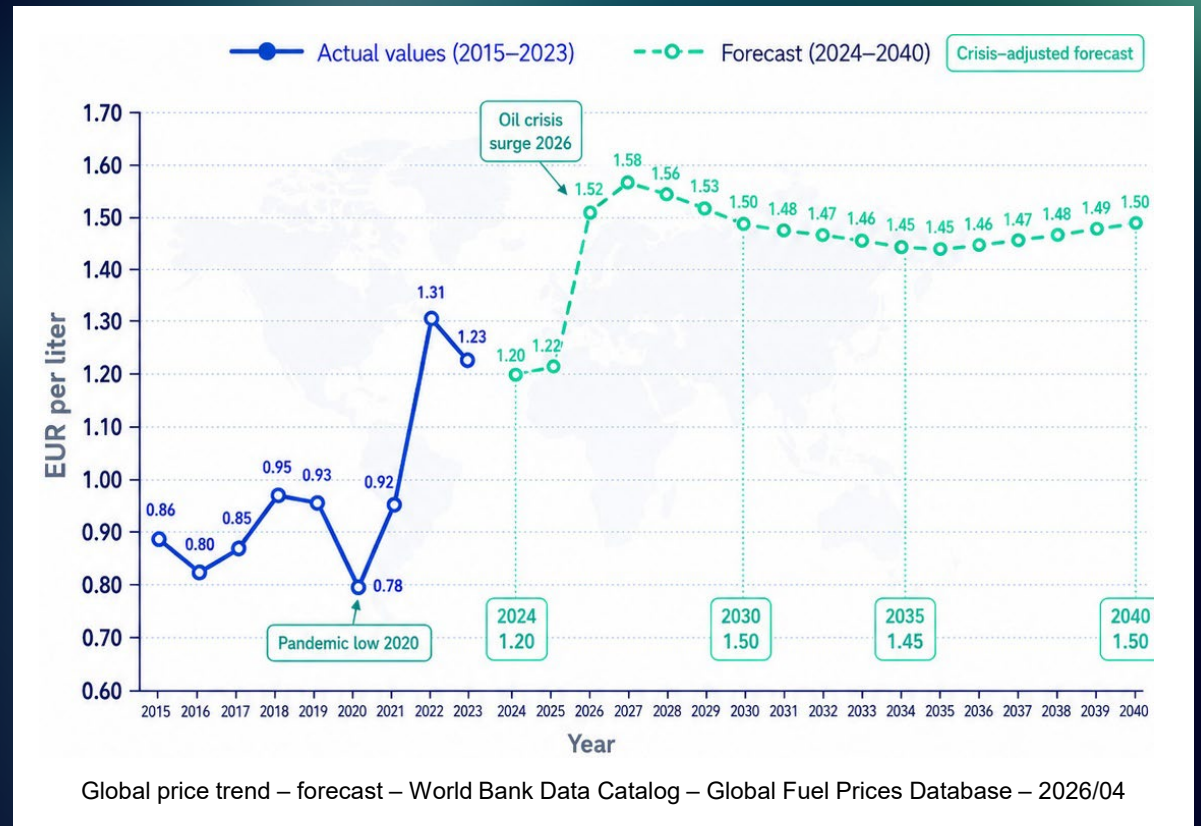


The energy trilemma

Energy accessibility & affordability

→ Critical energy infrastructure: No-grid / bad-grid

→ Rising diesel price / increasing CO₂ pricing



The energy trilemma

Energy accessibility & affordability

- Critical energy infrastructure: No-grid / bad-grid
- Rising diesel price / increasing CO₂ pricing

Energy security & reliability

- Customers need a secure energy supply to ensure a reliable run of their application



We solve the energy trilemma

Energy accessibility & affordability

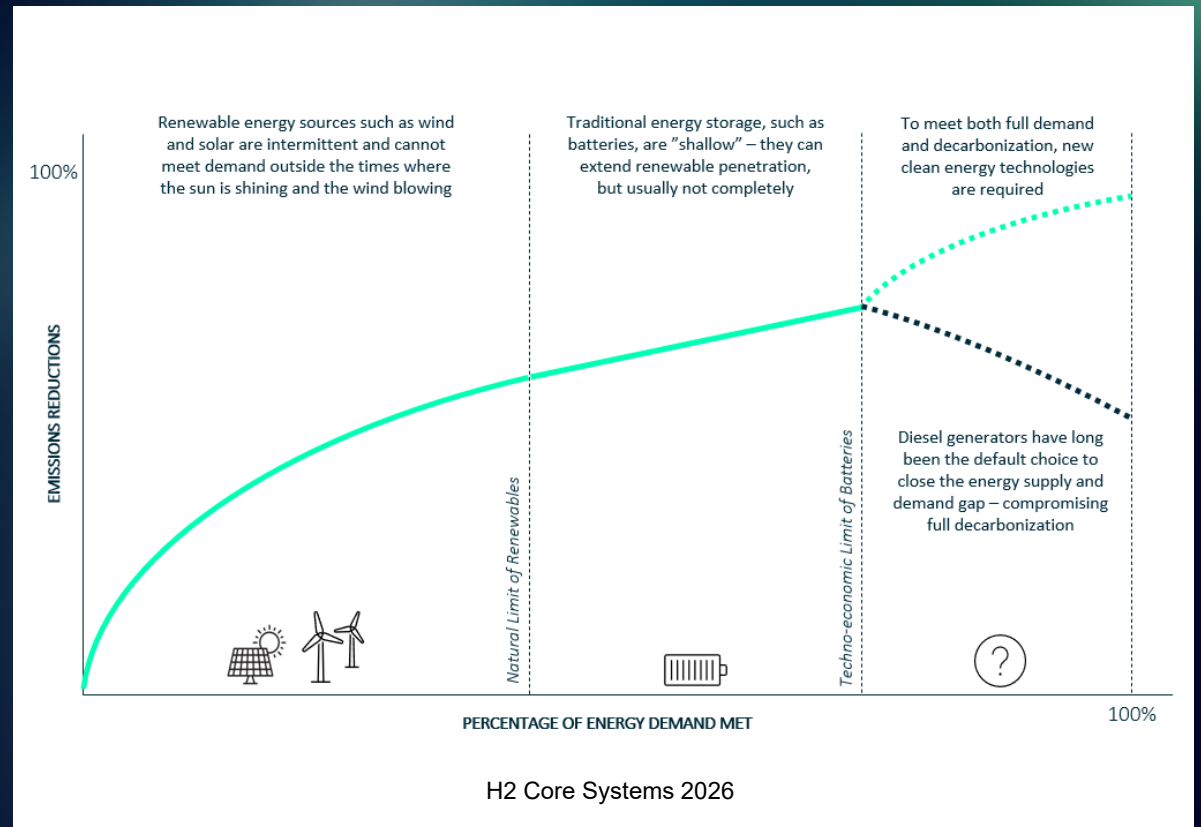
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Energy security & reliability

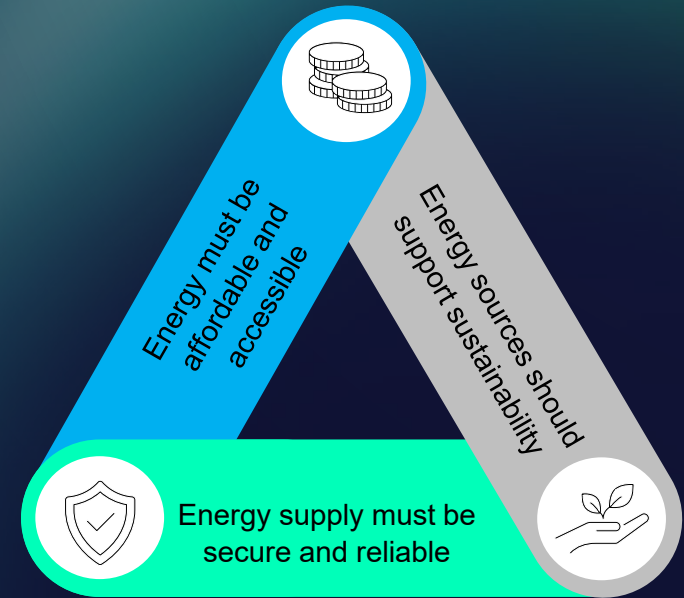
- Customers need a secure energy supply to ensure a reliable run of their application

Energy sustainability

- Companies want a carbon-neutral footprint



The energy trilemma



Improving one challenge will impact the others. Designed and applied correctly, H2 Core hydrogen systems have the potential to balance all three! Independent – Profitable – Secure.

H2 Core energy solutions



Specialised in the development of modular hydrogen energy systems ≤ 1 MW (niche market)



Comprehensive expertise in electrolysis, storage and energy management



Turnkey solutions covering engineering, production and commissioning



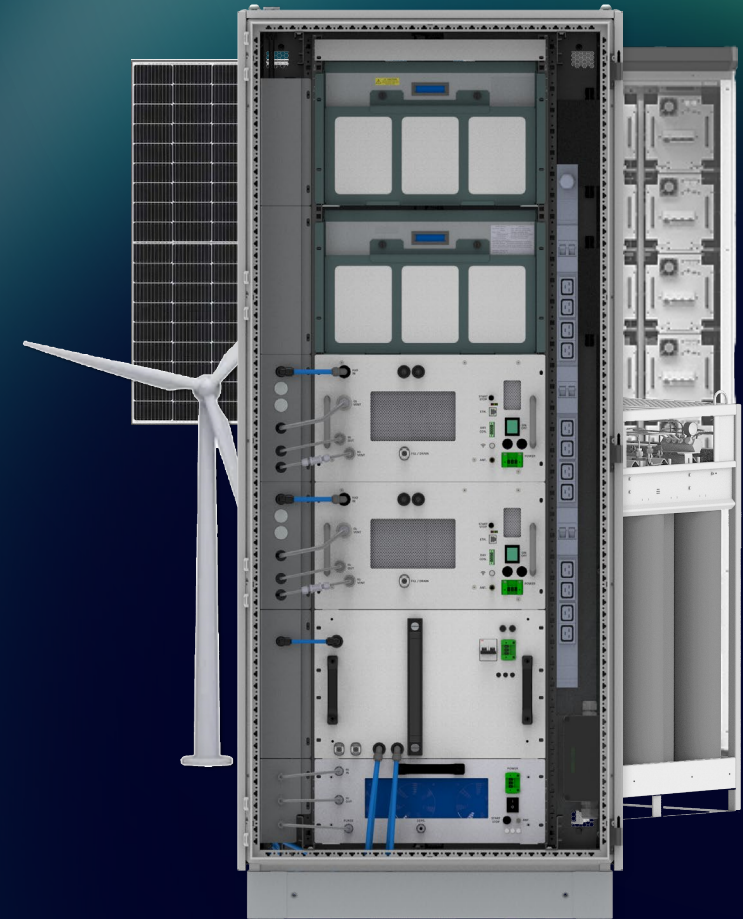
Strong focus on reliability, safety and mission-critical applications – Plug-and-play ready



For off-grid applications, backup power, microgrids, industry and critical infrastructure



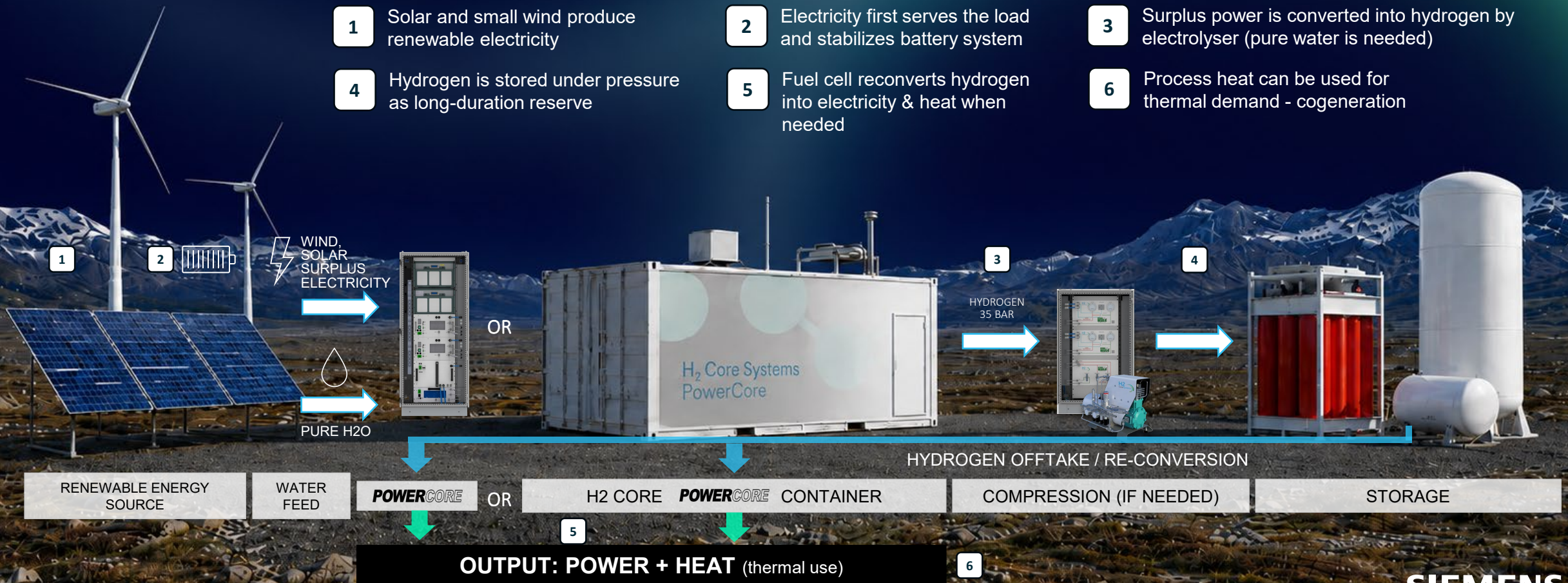
Proven track record of delivering reliable and scalable energy systems > 300 projects worldwide



H2 Core Systems principle

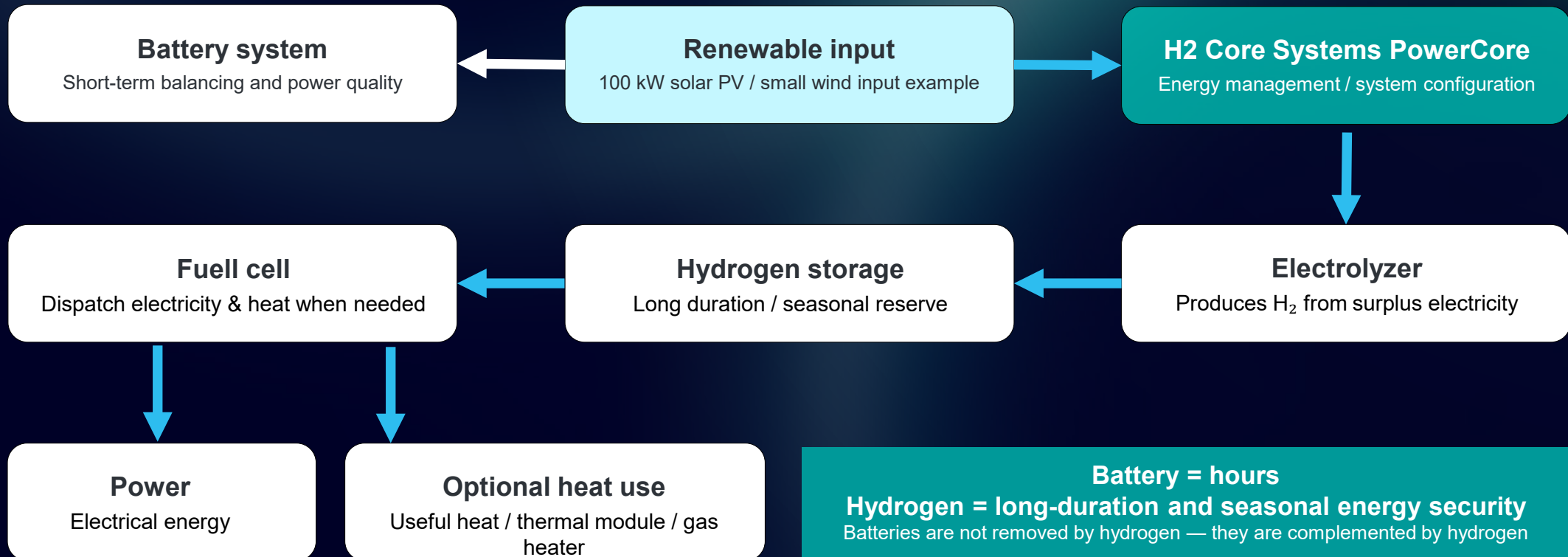
The H2 Core Systems approach combines renewable energy, electrolysis, hydrogen storage and reconversion into an integrated energy supply concept.

- 1** Solar and small wind produce renewable electricity
- 2** Electricity first serves the load and stabilizes battery system
- 3** Surplus power is converted into hydrogen by electrolyser (pure water is needed)
- 4** Hydrogen is stored under pressure as long-duration reserve
- 5** Fuel cell reconverts hydrogen into electricity & heat when needed
- 6** Process heat can be used for thermal demand - cogeneration



The energy flow architecture

The concept is easy to understand - renewable electricity is used immediately, stored for short durations in batteries and converted into hydrogen for longer durations.



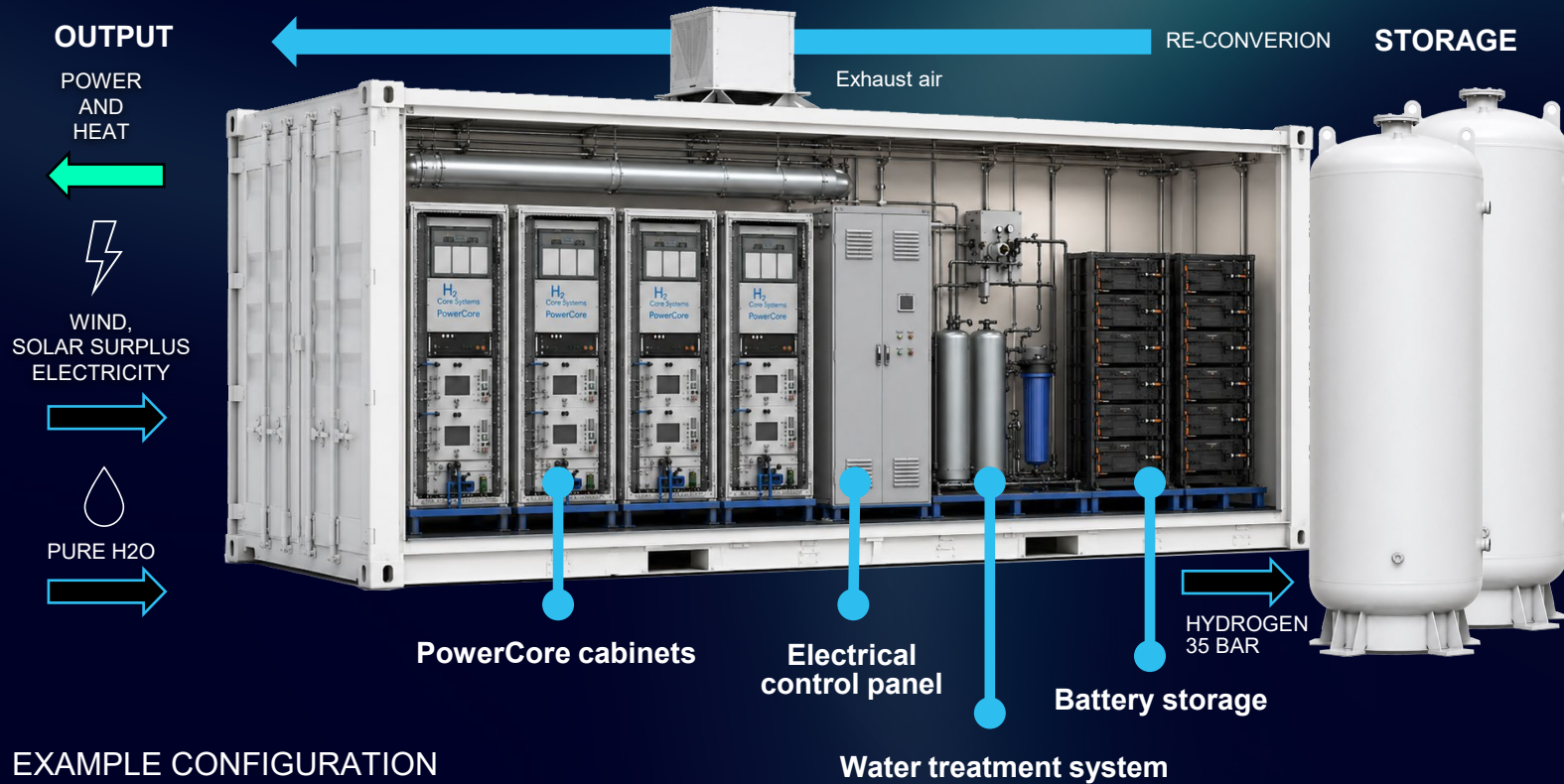
Modular design architecture

Individual components can easily added, removed or replaced as needed. This provides flexibility to tailor the system size and configuration.



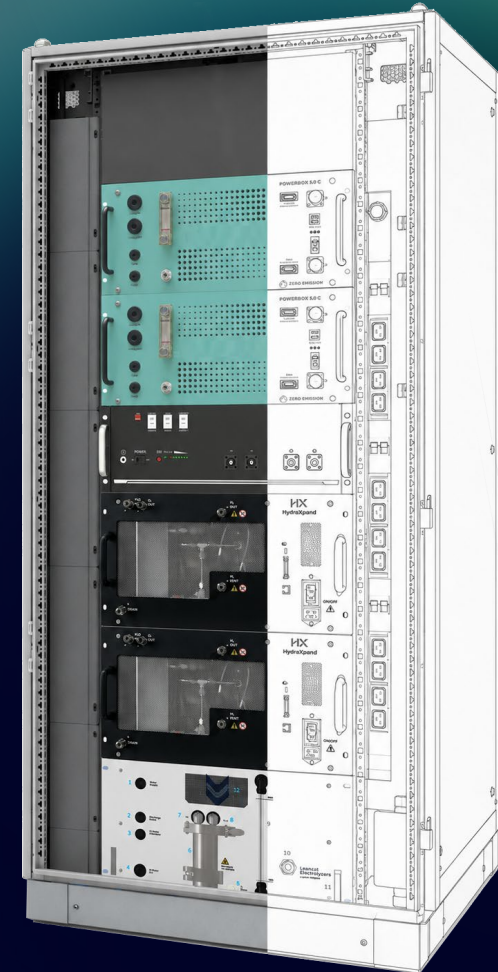
PowerCore outdoor container

Our solution enables a higher hydrogen production rate and provides more space for extensive configurations of additional components like battery storage or water treatment systems.



H2 systems are complex

- Many energy problems = Many hydrogen solutions
- A wide range of system configurations
Customer requirements, energy needs, location, existing technology,
weather conditions (renewables), on-grid / off-grid
- We do need stringent design requirements to
ensure safe H2 system setups
- Designcenter X Solid Edge enables H2 Core the
management of these complex design requirements
Digital twin / use of modular solutions



USE CASE: GIFHORN

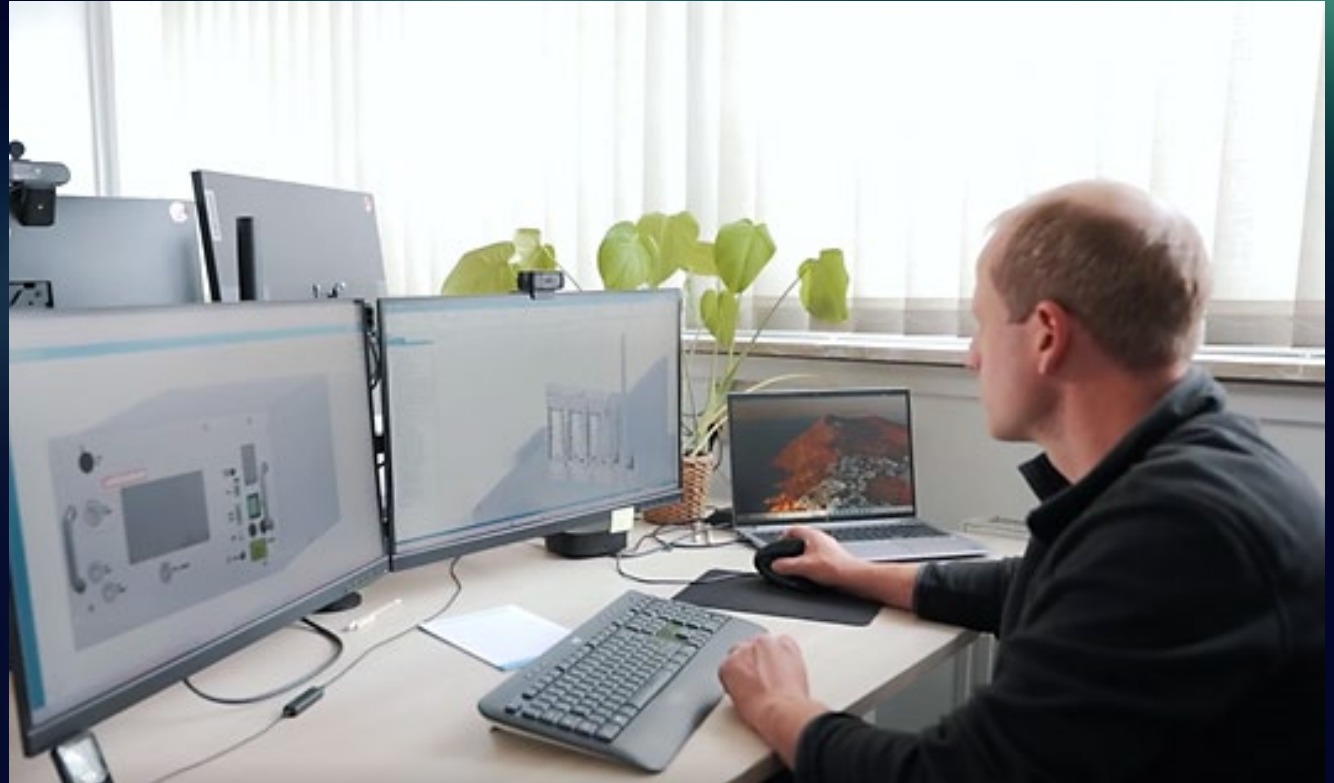
Customer design requirements

- Use of excess PV Power
- Hydrogen production as power storage (approx. 5 MWh)
- Optional refueling station for forklifts
- Use of hydrogen during winter for electricity + heat



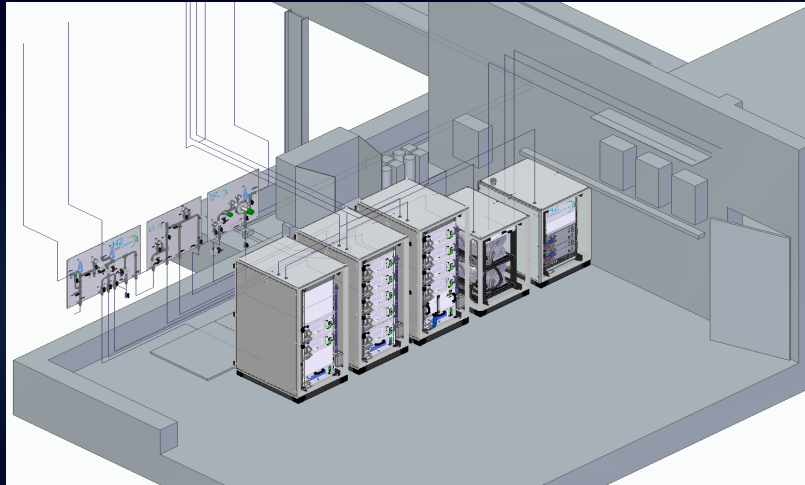
Our Designcenter advantages

- Overview about complex structures
- Digital Twin / Parts List
- Performance
- Usability
- Coworking
- Connection to other CAD Tools
- Rendering
- Upgrades

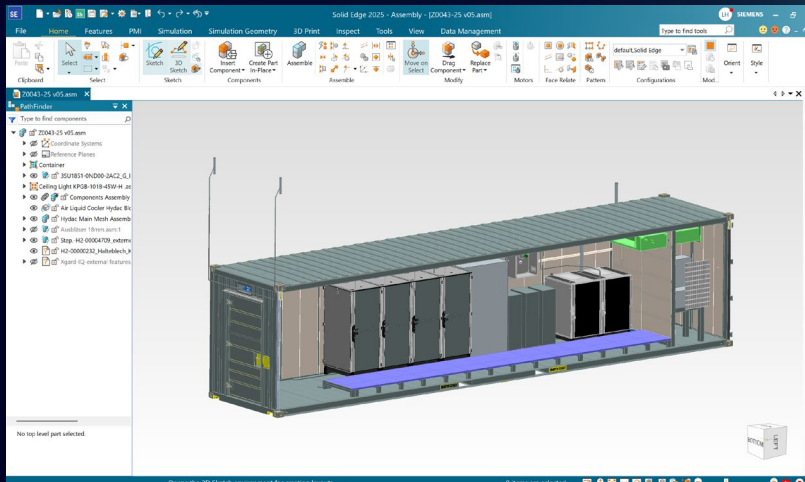


Realized customer projects

- Gifhorn

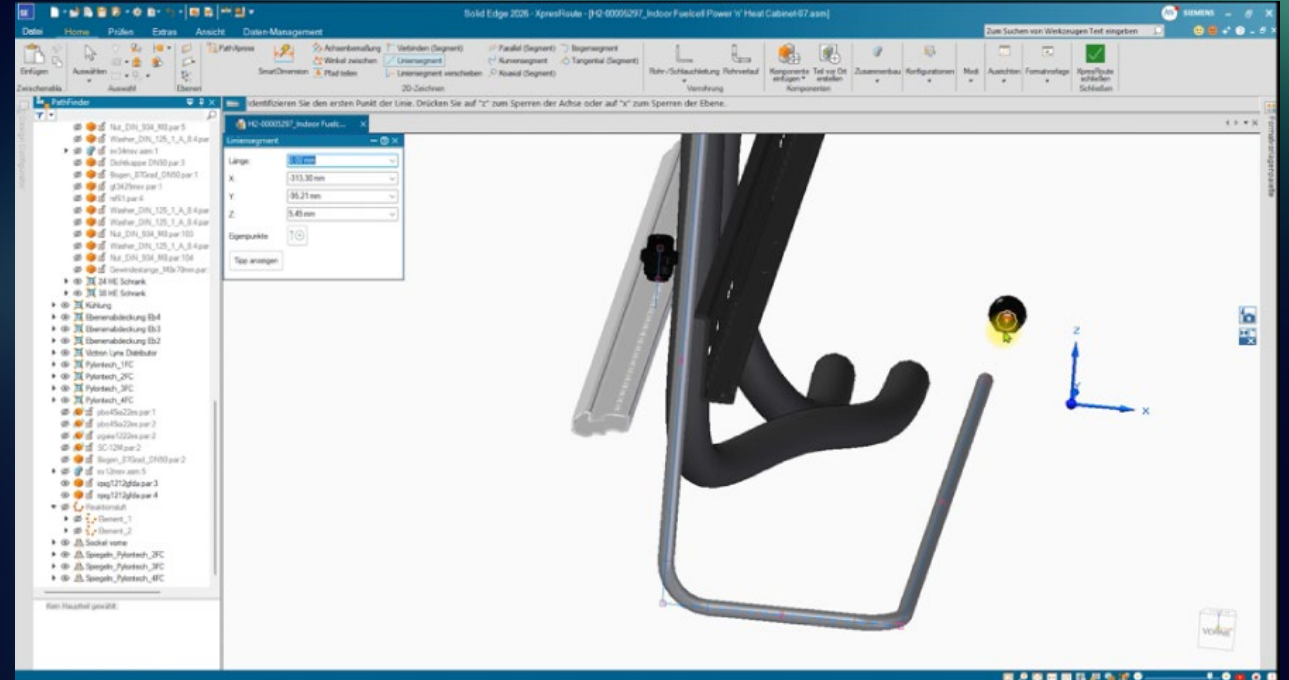


- Africa



Our AI topic wish list

- Optimization of all routing paths for additional pipes/hoses
- Define medium – pressure – automatic adjustment / display – safety considerations
- Pressure loss calculation
- Better Connection to our ERP system
- Intelligent routing based on mounting points



Contact



H2 Core Systems
Sales team

E-mail: sales@h2coresystems.com

H2 Core Systems GmbH
Ruesdorfer Str. 8
25746 Heide - Germany

www.h2coresystems.com



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