



Metal Hydride | Solid H₂ Storage

Safe | Low Pressure | Low Temp | Small Footprint | High Density

GREEN. SAFE. COMPACT.



GKN Hydrogen Company Brief

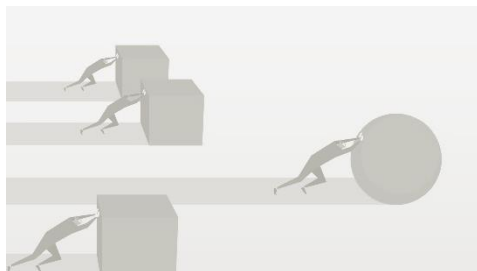
Unique Market Position

| | | |
|--|--|---|
|  <p>GKN POWDER METALLURGY</p>  <p>#1 Global Producer of Powder Metal Parts</p> <p>13 Million Parts Daily</p> |  <p>GKN ADDITIVE</p>  <p>A Global Market Leader in 3D Printing</p> <p>2 Million Parts Annually</p> |  <p>GKN POWDER METALLURGY</p>  <p>#2 Global Producer of Powder Metal</p> <p>Investing €15M/yr in H2 Powder Production</p> |
|--|--|---|



Pioneer in Safe Storage of Green Hydrogen

Company Launch in May 2021

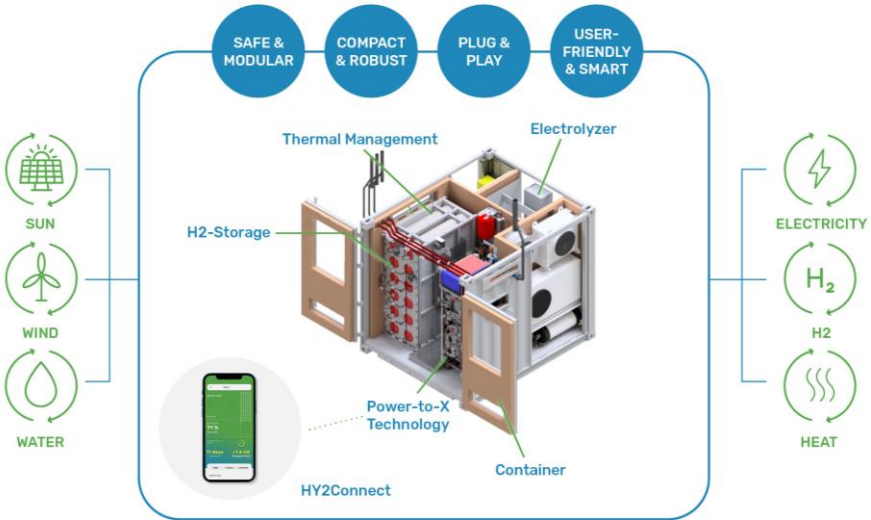


Secure supply chain from leading powder metal producer
Metal Hydride Intellectual Property
GKN Hydrogen's Technical Know-How

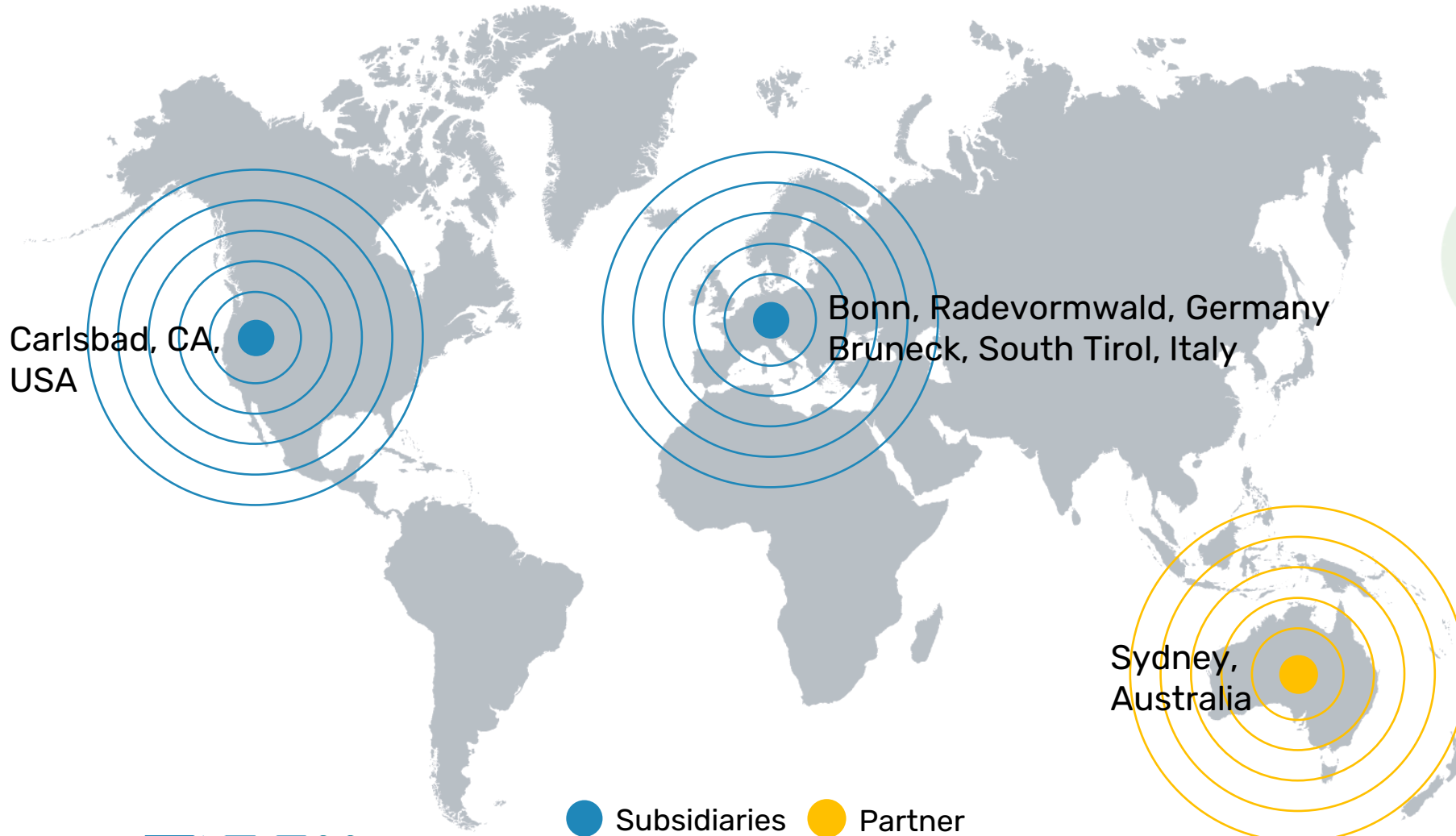
GKN Hydrogen at a Glance

We are a **pioneer** in storing **hydrogen**, utilising a solid-state technology of metal hydrides that is **safe, compact and sustainable**. The system enables a **long lifespan of storage**, outperforming alternative hydrogen storage technologies and can be used to **store green hydrogen** from renewable sources

Safe, Compact and Sustainable versus Alternative Technologies



GKN Hydrogen = Green H₂ Energy Storage



Europe

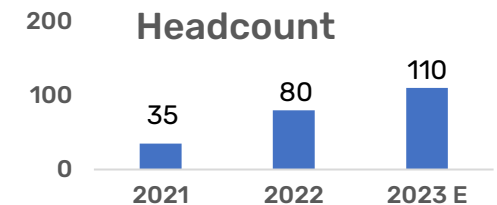
- Research & Development
- Application Engineering
- Supply Chain
- Manufacturing
- Project Management
- Service

USA

- Application Engineering
- Project Management
- Service

Australia

- Application Engineering
- Project Management
- Service



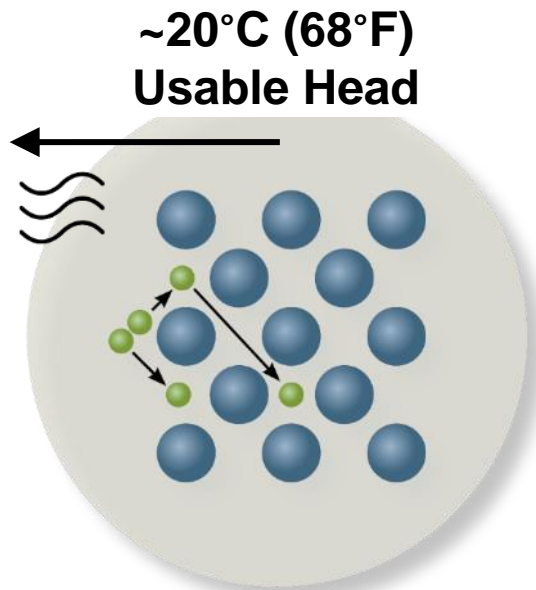


How it Works

How It Works

Hydrogen Charging

- H₂ gas is fed to the metal Fe/Ti alloy at pressure up to 35 bar
- Alloy reacts with hydrogen, creating a metal hydride and releases heat

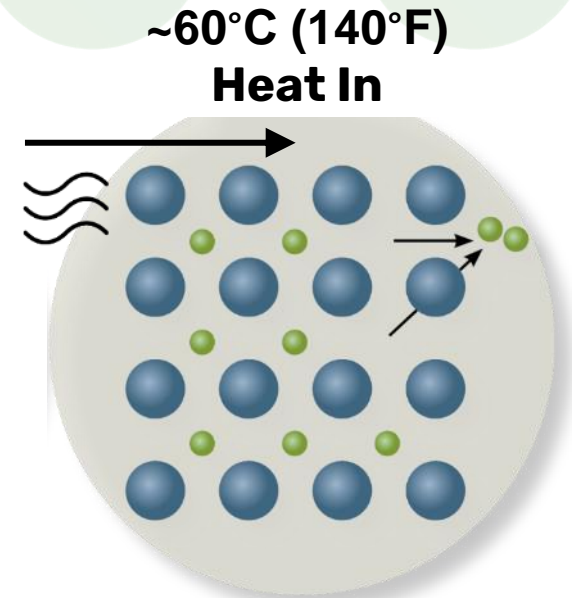


Long-Duration Storage

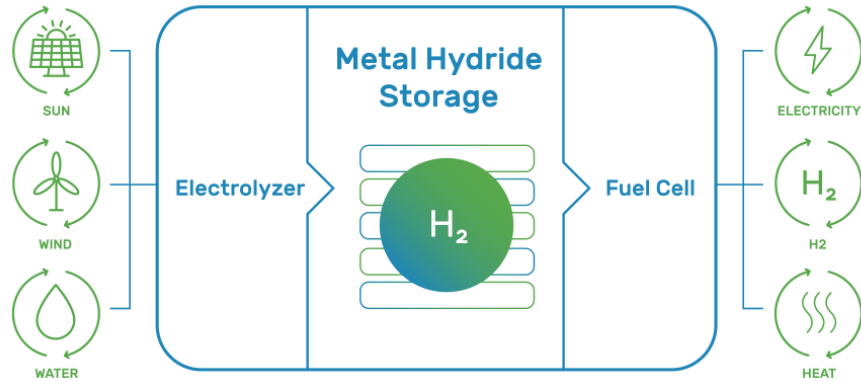
- Indefinitely stored without losses indefinitely until needed
- ~96% chemically bonded, only 4% gaseous

Hydrogen Discharging

- Metal hydride is heated
- H₂ is released safely



Power 2 Power Systems



HY2MINI



HY2MEDI

- **largely plug-and-play**, self-contained systems with electrolyser and fuel cell included
- **custom-built** for use cases with lower-to-mid range energy requirements
- **easily deployable** in a range of settings at low cost and larger scale applications
- **important proof of concept** for new customers in smaller applications
- **highly flexible** and the size of the system is well-suited to standalone / off-grid application
- **offers flexibility and safety** as a back-up power supply, and for micro grids
- **maximizes flexibility** as it can be configured to provide electricity and thermal energy (HY2MEDI)

Power 2 Power Systems – Technical Data

HY2MINI



Dimensions / Weight

3m x 2.5m x 2.6m /
4,000 – 6,000 kg

Key Specifications



Energy Storage Capacity

165 – 420 kWh electrical
10 – 25kg H₂ @ max. 40 bar



Electrolyser

1 – 4 kg hydrogen per 24h



Nominal Load

7 kW



Peak Load

19 kW (15 min every 12h)



Output Voltages

EU 120V / 230V / 400V – 50Hz
NA 120V / 240V / 480V – 60Hz



Power During Outage

7 kW up to 60h

HY2MEDI



Dimensions / Weight

6 m x 2.5m x 2.6m /
13,000 – 23,000kg

Key Specifications



Energy Storage Capacity

0.5 – 2 MWh electrical
30 – 120kg H₂ @ max. 40 bar



Electrolyser

Up to 10kg hydrogen per 24h



Nominal Load

7-14 kW



Peak Load

14W / 19kW (15 min every 12h)



Output Voltages

EU 120V / 230V / 400V – 50Hz
NA 120V / 240V / 480V – 60Hz



Power During Outage

7kW up to 285h /
14kW up to 142h

Power 2 Power Applications

Application

- Remote / Off-Grid
- Energy Balancing
- Back-up Power
- Micro Grid
- Combined Heat & Power



HY2MINI



HY2MEDI

Hotels



Commercial Buildings



Large Residential Areas



EV Charging Infrastructure



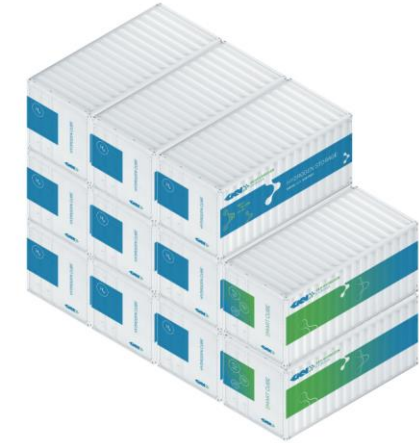
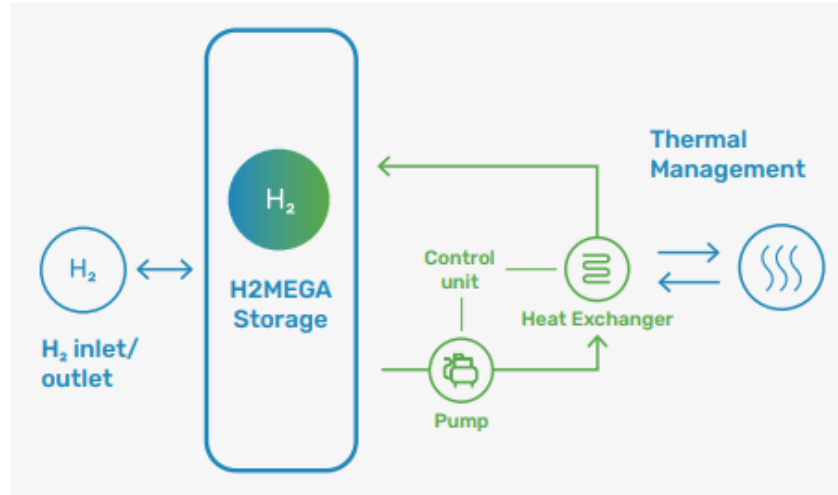
Utilization of Renewables



University and R&D Test Infrastructure



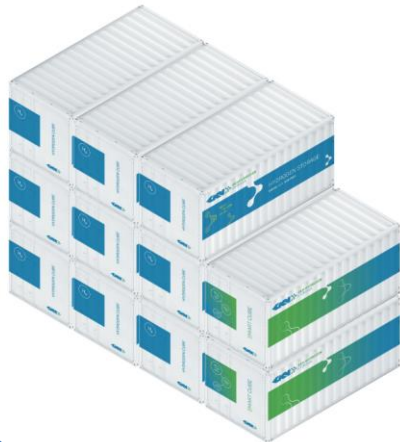
Hydrogen Storage



- **Larger system for storing hydrogen** as part of utility-scale grid cases or for decarbonizing hard to abate sectors (e.g. green hydrogen as a feedstock for steel producers)
- **Product can be stacked**, including vertically, to maximize storage capacity
- **Flexibility to integrate** with the customers existing electrolysis processes
- **highly flexible** and the size of the system is well-suited for large industrial and infrastructure applications with less space
- **Very suitable for** industrial applications with Hydrogen direct use and large infrastructure back up solutions to replace of diesel backup power

Hydrogen Storage

HY2MEGA



Dimensions / Weight

3m x 2.5m x 2.6m /
4,000 – 6,000 kg

Key Specifications



Hydrogen Storage Capacity

Up to 250 kg / Unit
Units can be clustered / stacked



Transportable

By truck and train



Pressure Range

0.5 – 40bar(g)



Output Voltages

EU 120V / 230V / 400V – 50Hz
NA 120V / 240V / 480V – 60Hz



Hydrogen Quality

5 – 99.999%

Electrolyzer and Fuel Cell upon Customer request

Hydrogen Storage

Application

- Hydrogen Direct Use
- Hydrogen on Demand



Heavy Transport



Critical Infrastructure Backup



Industrial Process



Grid Services Firming & Support



Energy Demanding Industries








Hydrogen Refueling





Application areas and project experience

Compelling Story for a Diverse Range of Applications

| | |
|--|---|
| <p>Utilities / Energy Rebalancing</p>  | <p>Management of fluctuating renewable energy volumes e.g. excess energy from solar power seasonably stored or sold back to the grid. Contributes to decarbonize utilities. 100% renewable alter-native to coal or gas fired peaker plants in low-energy periods.</p> |
| <p>Remote Power Supply / 100% Off-Grid</p>  | <p>Enables 100% off-grid living in remote locations, with a fully decentralized renewable energy system that permits storage over a multi-year time horizon. No requirement for direct electricity transmission.</p> |
| <p>Back-Up Power Supply</p>  | <p>Serves as a mission critical, back-up power supply for large energy users such as data centers or industrial manufacturers, replacing diesel generated back-up supply, and with a longer lifespan than batteries</p> |
| <p>Auxiliary Power Supply</p>  | <p>Typically utilized to provide sustainable storage from renewable power sources for auxiliary power output e.g., from a commercial building to EV chargers in the car park</p> |
| <p>Hydrogen Direct Use</p>  | <p>Allows large industrial users to decarbonize their energy mix by injecting large volumes of stored green hydrogen (e.g petroleum refining, chemicals processing and materials production)</p> |

Strong Validation From Our Existing Customer Base



 **Cutlers Cottage (2022)**

| | |
|----------|----------|
| Use Case | Off-Grid |
| System | HY2MINI |
| Size | 0.45MWh |



 **Knappenhau (2018)**

| | |
|----------|----------|
| Use Case | Off-Grid |
| System | Pilot |
| Size | 0.30MWh |



 **Elektro Bauer (2022)**

| | |
|----------|----------|
| Use Case | Off-Grid |
| System | HY2MEDI |
| Size | 0.81MWh |



 **Fincantieri (2022)**

| | |
|----------|----------|
| Use Case | Maritime |
| System | Custom |
| Size | 40kg H2 |



 **Mt Holly Microgrid (2022)**


| | |
|----------|-----------|
| Use Case | Auxiliary |
| System | HY2MINI |
| Size | 0.45MWh |



 **ACOM (2022)**

| | |
|----------|-------------------|
| Use Case | Rebalancing / CHP |
| System | HY2MINI |
| Size | 0.42MWh |



 **IT Back-up (2020)**

| | |
|----------|-----------|
| Use Case | Auxiliary |
| System | HY2MINI |
| Size | 0.33MWh |



 **Plug-in E-Charging (2021)**

| | |
|----------|-----------|
| Use Case | Auxiliary |
| System | HY2MINI |
| Size | 0.33MWh |



 **Müller Hütte (2022)**

| | |
|----------|----------|
| Use Case | Off-grid |
| System | Custom |
| Size | 0.90MWh |



 **Arieshof (2022)**

| | |
|----------|-------------|
| Use Case | Rebalancing |
| System | HY2MEDI |
| Size | 2.00MWh |



 **CEC Phelan (2022)**

| | |
|----------|----------------------|
| Use Case | Back-up/ Rebalancing |
| System | HY2MEDI |
| Size | 0.41MWh |



 **Rubner Haus (2022)**

| | |
|----------|------------------|
| Use Case | Rebalancing Demo |
| System | HY2MINI |
| Size | 0.27MWh |



 **Carlsbad (2022)**

| | |
|----------|-----------|
| Use Case | Demo Unit |
| System | Custom |
| Size | 0.42MWh |



 **Bruneck**

| | |
|----------|----------------------|
| Use Case | Demo Unit |
| System | HY2MEGA |
| Size | 286kg H ₂ |

"We have built a farm where we organically grow and produce our own food, can accommodate guests, and produce and store our own energy so that we are 95% CO₂ neutral."

Christoph Groner,
CEO and Founder



Compelling Project Benefits

Safe Technology

- No thermal runaway risk
- No pyrophoric => Non-reactive with air
- 15 x smaller energy storage at equal pressure technology
- Low pressure (0,5 to 40 bar)
- Global controls interlocking modules => enhanced safety
- Ease of permitting

Efficient Products

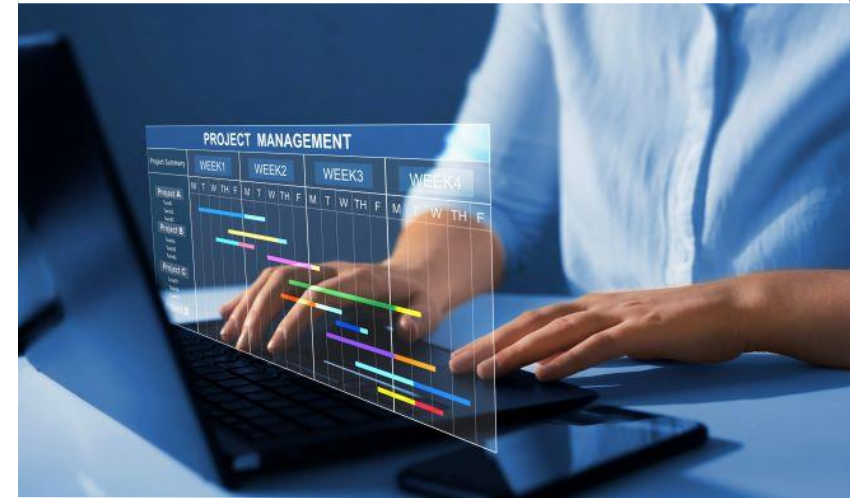
- Longer lifetime > 30 years
- Enables low-cost renewables
- Efficient H2 release (4kWh / kg)
- No self-discharge and unlimited cycles
- Minimal maintenance
- No compression required

Performance Application Engineering

- Simple install (plug & play)
- Short lead time (6-8 months)
- Transports easily & movable
- Smaller footprint and setbacks
- Digital real time monitoring
- Configured to site layout & capacity
- Scales vertically (up to 5 high)
- Use case simulation

Smart Services

- Digital performance monitoring
- Digital service plans
- Remote maintenance
- Global fleet management
- Efficient alarm management

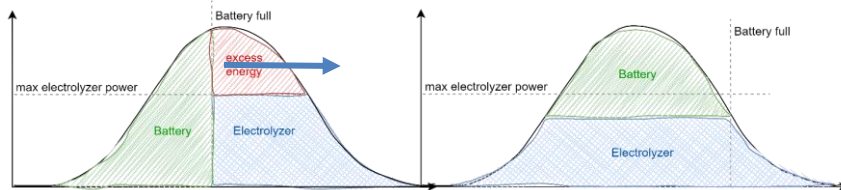


Digitization – Easy to Manage

HY2Connect app and digital platform for remote control and monitoring of system operation and integration with other energy management control systems

Adaptive Control System

Continuous control strategy optimisation based on production forecast and demand analysis



Value Reports

Performance monitoring, usage summary, environmental data - Storage as a Service

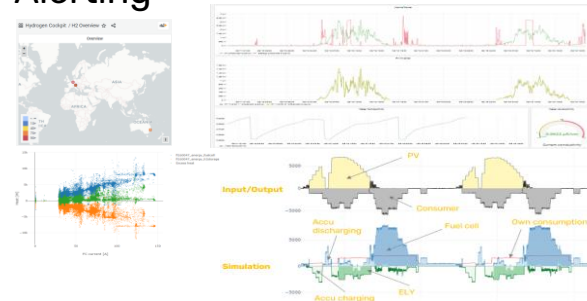
Measurement and Verification

Artificial intelligence & machine learning techniques for performance guarantees – Storage as a Service



Digital Cockpit

Fleet Management, Monitoring and Alerting



Advanced Analytics

System efficiency optimisation, error pattern recognition and anomaly detection

Digital Twin Simulation

Replicates behavior of system for various demand/production profiles over long time periods

