STORING POWER WITHOUT LIMITS!
MAKING RENEWABLES RELIABLE

LOHC
H₂-INDUSTRIES stores energy without limits and makes renewables reliable, 24/7.

Base load capable and decentralized
H₂-INDUSTRIES ENABLES SUSTAINABLE POWER STORAGE SOLUTIONS

BENEFITS – POWER TO LIQUID TO POWER

1. LOW COST
2. SAFETY
3. UNLIMITED CAPACITY
4. ZERO EMISSIONS

... MAKING RENEWABLES RELIABLE WITH LOHC
OUR MISSION | HYDROGEN CARRIER TECHNOLOGY

**LOHC** (LIQUID ORGANIC HYDROGEN CARRIER) ENABLES HYDROGEN ECONOMY

HYDROGEN CAN BE STORED & RELEASED EFFICIENTLY UNDER AMBIENT CONDITIONS
COMPANY PRESENTATION | LOHC TECHNOLOGY FLOW CHART

TECHNOLOGY FLOW CHART

THE VALUE CHAIN OF OUR SOLUTION

ELECTRIC POWER  STORING POWER  STORAGE  TRANSPORTATION  RELEASING POWER

THE PROCESS BEHIND OUR SOLUTION

STORE eUNIT

SOLAR  WIND  BIO  GRID

POWER

33 kW

33 kW

GRID & OFF-GRID

POWER

H₂O

HEAT - USABLE FOR APPLICATIONS: 150°C

O₂

RELEASED TO AIR

H₂O

REQUIRED HEAT 300°C

HEAT - USABLE FOR APPLICATIONS: 80°C

H₂

FUEL CELL

H₂-UNLOADED LOHC

H₂-LOADED LOHC

TRAIN  SHIP  TRUCK  PIPELINE

H₂-UNLOADED LOHC

H₂-LOADED LOHC

H₂ UNLOADED LOHC

H₂ STORE eCELL

HYDROGEN GENERATION DUE TO ELECTROLYZER

H₂ RELEASE eCELL

© H₂-INDUSTRIES SE

3
LOHC outperforms all other energy storage solutions and provides the optimal combination of storage capacity and transportation flexibility.

- It is the only technology that covers the entire storage range from 0.1 to 1000 MWh.
- Compared to conventional hydrogen storage technology it can be handled and transported safely under normal conditions using existing infrastructure.

LOHC SYSTEMS ARE CHARACTERIZED BY A DECOUPLED STORAGE AND POWER DENSITY COMPARED TO CONVENTIONAL HYDROGEN STORAGE TECHNOLOGIES.
Solutions for solar parks

Photovoltaic power plants do not produce electricity at night or when the sky is heavily overcast. Other electricity suppliers have to step in. Our LOHC energy storage solutions will provide solar power around the clock.
Many countries still rely on conventional power plants (nuclear/coal), which endanger significantly our planet.

Our energy storage technology will make it possible to economically realise large, multi-redundant (solar) power plants in the Gigawatt (GW) range. GW power plants are the ideal solution for replacing nuclear/fossil power plants.
Solutions for wind farms

Sometimes wind turbines deliver too much electricity, sometimes not enough. They often have to be turned away from the wind. Our energy storage technology will provide for greater use of wind turbines, allowing wind power to meet base load requirements.
Solutions for buildings

A large proportion of the operating costs of a building are energy costs for electricity, heating, hot water and air conditioning. By using our LOHC storage technology, energy is used more cleverly and costs are reduced. In addition this solution will improve the sustainability of commercial and residential buildings.
Solutions for municipal utilities

The production of renewable energy is subject to strong fluctuations caused by the weather. This in turn threatens power grid stability.

Our energy storage technology will enable power grids to be stabilised, decentralised energy supplies to meet base load requirements with renewable energy sources, unprofitable reserve power plants to be shut down, as well as prolonged and expensive network upgrades to be bypassed.
Solutions for transporting energy

Renewable energy is often not produced where it is needed. Our LOHC energy storage systems eliminates the need for expensive transmission networks. LOHC technology will allow stored energy to be transported to any location using existing infrastructure.
Solutions for backup power without diesel

Environmentally damaging diesel generators ensure the backup power supply in hospitals, industrial plants and office buildings. Our LOHC generator solutions will provide a clean, reliable and uninterruptible power supply.
Solutions for supplying power without a grid

In areas with insufficient grid coverage (i.e. on islands or remote locations), environmentally harmful and unreliable diesel generators supply the required electricity.

With our photovoltaic LOHC solutions, solar energy will be used to generate clean electricity – day and night.
Solutions for every kind of ship

Ships are irreplaceable on oceans and rivers. But they are powered by diesel engines that emit significant amounts of CO2 and NOx. Our retrofittable LOHC solutions will offer an emission-free, all-electric ship propulsion system. LOHC can be refueled like diesel and enough clean energy can be stored to cross oceans.
Many thousand miles of rail lines have not yet been electrified (e.g. roughly 40% in Germany) and are used by diesel engines. Our LOHC energy storage technology will enable the trains to run without any emissions and to be quickly refueled.
Solution for e-mobility

E-mobility has currently reached its limit in terms of range and charging times. Our range extenders will allow power to be continuously generated whilst you are driving, therefore considerably increasing the range. 100-200 kWh of electrical energy bound in LOHC can be refueled in a few minutes – so you can continue with your journey.

PRODUCT DESCRIPTION:
The STORE eRACK converts electrical power via electrolysis to hydrogen and binds it in the LOHC.

Our 66 kW eRACKs are the basic components for all our products.

PRODUCT DESCRIPTION:
The RELEASE eUNIT releases the hydrogen from the LOHC and directly burns it in the fuel cell to produce electrical power.

Our 66 kW eRACKs are the basic components for all our products.
H₂-INDUSTRIES WILL BUILD MODULAR COMPONENTS FOR ALL BUSINESS APPLICATIONS

66 KW → 1.65 MW → ANY SIZE

66 KW → 792 KW → ANY SIZE

66 KW → 1.65 MW → ANY SIZE

n x 66 kW

(n + m) x 66 kW

m x 66 kW

ALL COMBINATIONS POSSIBLE UP TO ANY SIZE

GW BUILDINGS UP TO ANY SIZE

THE LOHC’S MODULAR STRUCTURE FACILITATES CUSTOMIZED SOLUTIONS TO MAKE RENEWABLES RELIABLE – ANYTIME, ANYWHERE, ANY SIZE
**ADVANTAGES OF LOHC-BASED ENERGY STORAGE**

<table>
<thead>
<tr>
<th>SAFE &amp; CLEAN</th>
<th>HIGH ENERGY DENSITY</th>
<th>MODULAR &amp; SCALABLE</th>
<th>UNLIMITED STORAGE CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GRADE LESS TOXIC THAN DIESEL</td>
<td>1 kWh/L ELECTR. 1 kWh/L THERM.</td>
<td>FROM 33 kW UP TO GW</td>
<td>FROM 5 MWh TO TWh</td>
</tr>
<tr>
<td>HEAT, COOLING &amp; FRESHWATER</td>
<td>USABLE WITH EXISTING INFRASTRUCTURE</td>
<td>LONG TERM STABLE &amp; RECHARGEABLE</td>
<td>UNRIVALLED PRICE</td>
</tr>
<tr>
<td>FOR ALL APPLICATIONS</td>
<td>TRUCKS, TRAINS &amp; EXISTING FUEL STATIONS</td>
<td>INFINITY</td>
<td>UP TO 50 TIMES MORE COST EFFECTIVE THAN LI-ION-BATTERIES</td>
</tr>
</tbody>
</table>

**USP: BASED ON LOHC H2-INDUSTRIES HAS DEVELOPED A PRACTICAL SOLUTION WITH UNMATCHED COST ADVANTAGES**
Our energy storage systems are over 50x cheaper than Li-based energy storage systems for quantities over 5 GWh.

The “Energiewende” is possible!!!
**MARKET ADAPTION | TARGET SEGMENT: EMERGENCY GENERATORS POWERED BY LOHC**

**DIESEL GENERATOR**

| Power (KW) | 1,650 |
| Voltage (V) | 400 / 230 |
| Frequency (HZ) | 50 / 60 |
| Phase | Three Phases |
| Dimensions | 40 ft ISO container |
| Total cost of ownership (TCO) | 103 m € |
| Annual cost | ca. 4 m € |

**H₂-INDUSTRIES LOHC POWER**

| Power (KW) | 1,650 |
| Voltage (V) | Custom build |
| Frequency (HZ) | 50 / 60 |
| Phase | Custom build |
| Dimensions | 40 ft ISO container |
| Total cost of ownership (TCO) | 19 m € (incl. 15 m € for PV-Plant) |
| Annual cost | 0.1 m € |

**Investment case Diesel vs LOHC for independent power supply 24/7/365 days (25 years)**

- Diesel: 103 m € (0.36 €/kWh)
- LOHC: 19 m € (0.07 €/kWh)

**LOHC POWER SOLUTIONS ARE > 5 TIMES LESS EXPENSIVE COMPARED TO DIESEL GENERATORS**
FUTURE POTENTIAL | REVOLUTION IN THE POWER MARKET

PARADIGM CHANGE ENABLES NEW PLAYERS TO EMERGE

SMART GRID & BIG DATA
INTELLIGENT STORAGE
eMOBILITY
PROSUMER
eHEAT & COOLING
SMALL & DECENTRAL
CO₂-NEUTRAL & CARBON-FREE

“ENERGIEWENDE”

GLOBAL ENERGY TRADING PLATFORM

PIONEERS

CARBON & NUCLEAR

Google
TSLA
H₂ INDUSTRIES
SIEMENS
ABB
RWE
USEC
GAZPROM
DIVIDENDSOLAR
CISCO
blueyonder
SAVE OUR PLANET

✓ CO₂ – NEUTRAL & EMISSION FREE POWER STORAGE
✓ CLEAN WATER DUE TO SALTWATER DISTILLATION
✓ eMOBILITY ENABLER

... H₂-INDUSTRIES FOR A BETTER WORLD