



ENERGY | STORAGE | SOLUTIONS

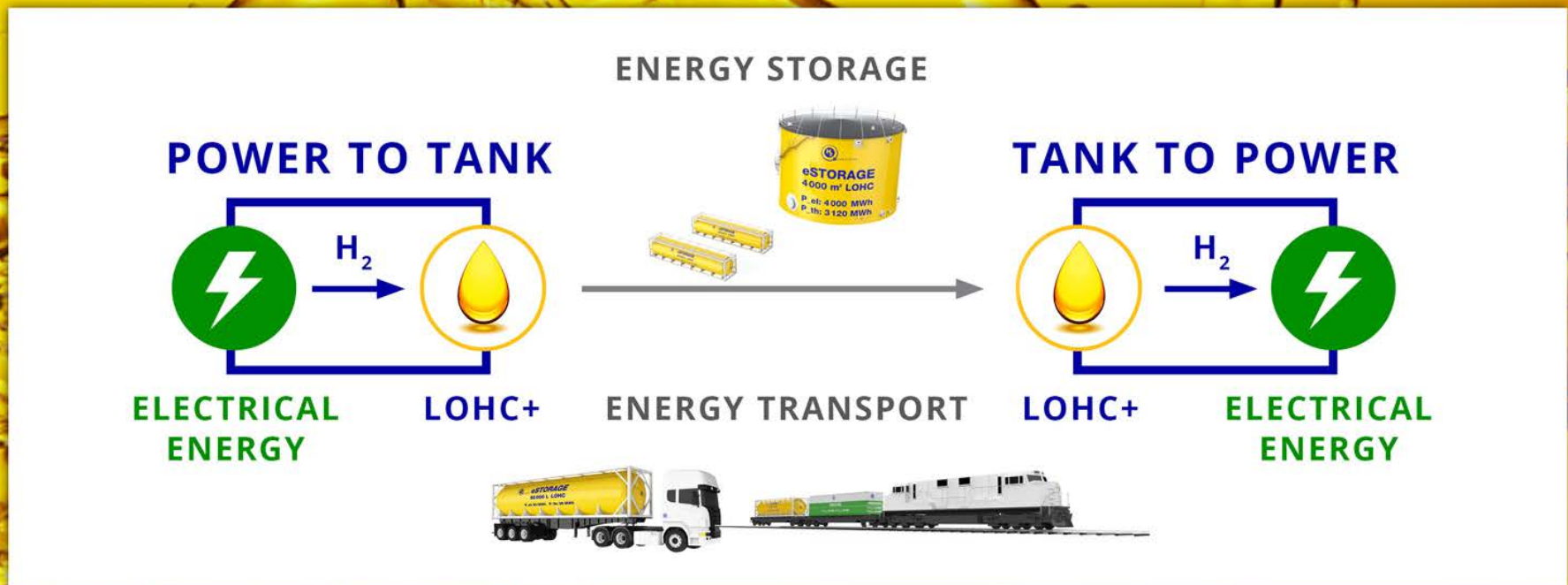
STORING POWER WITHOUT LIMITS! MAKING RENEWABLES RELIABLE



COMPANY OVERVIEW

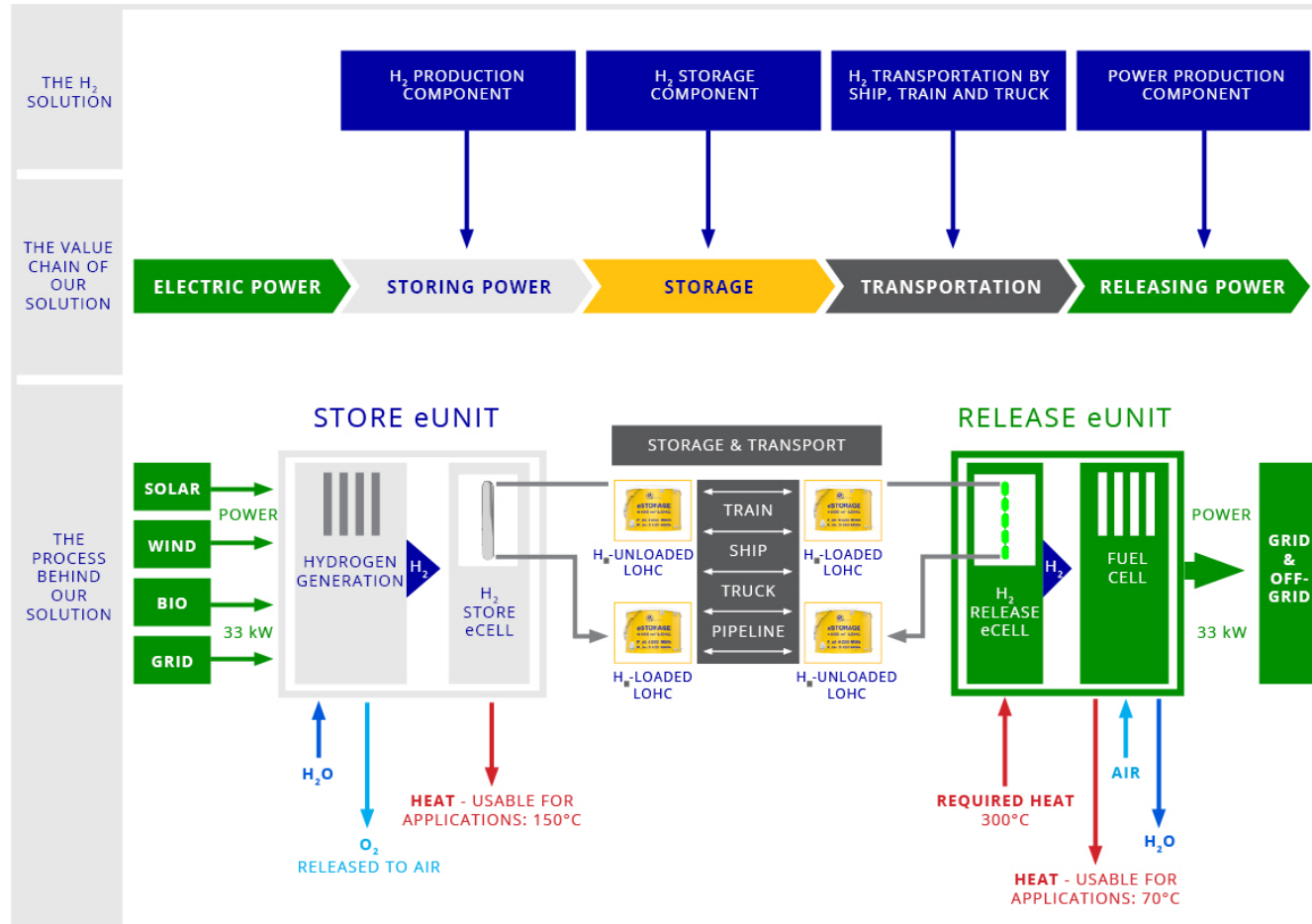
OCTOBER 2014

LOHC - THE LIQUID GOLD



HYDROGEN CAN BE STORED SAFELY UNDER AMBIENT CONDITIONS AND DOES NOT SELF-DISCHARGE

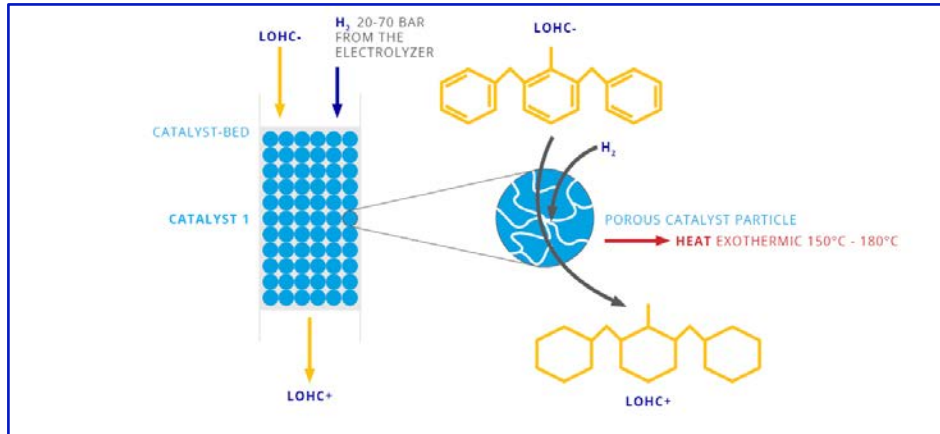
TECHNOLOGY FLOW CHART



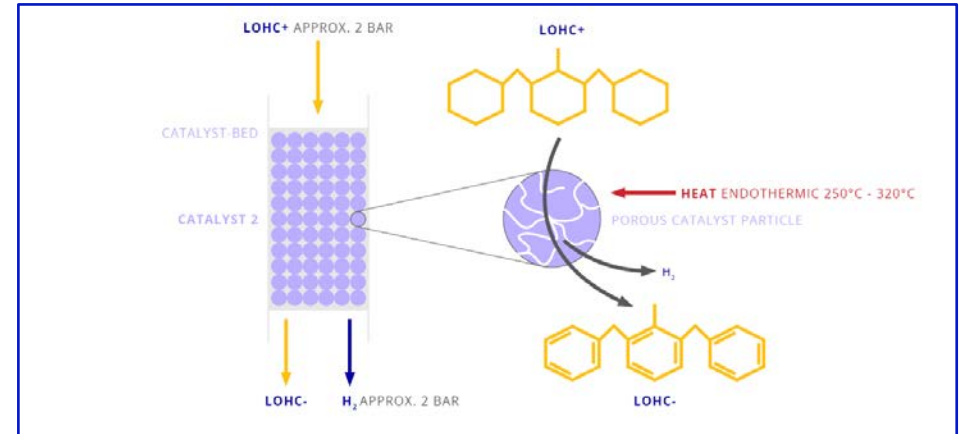
ELECTRICAL ENERGY IS STORED SAFELY UNDER AMBIENT CONDITIONS IN LOHC.
FOR THE TRANSPORT EXISTING INFRASTRUCTURE CAN BE USED.



LOHC STORAGE



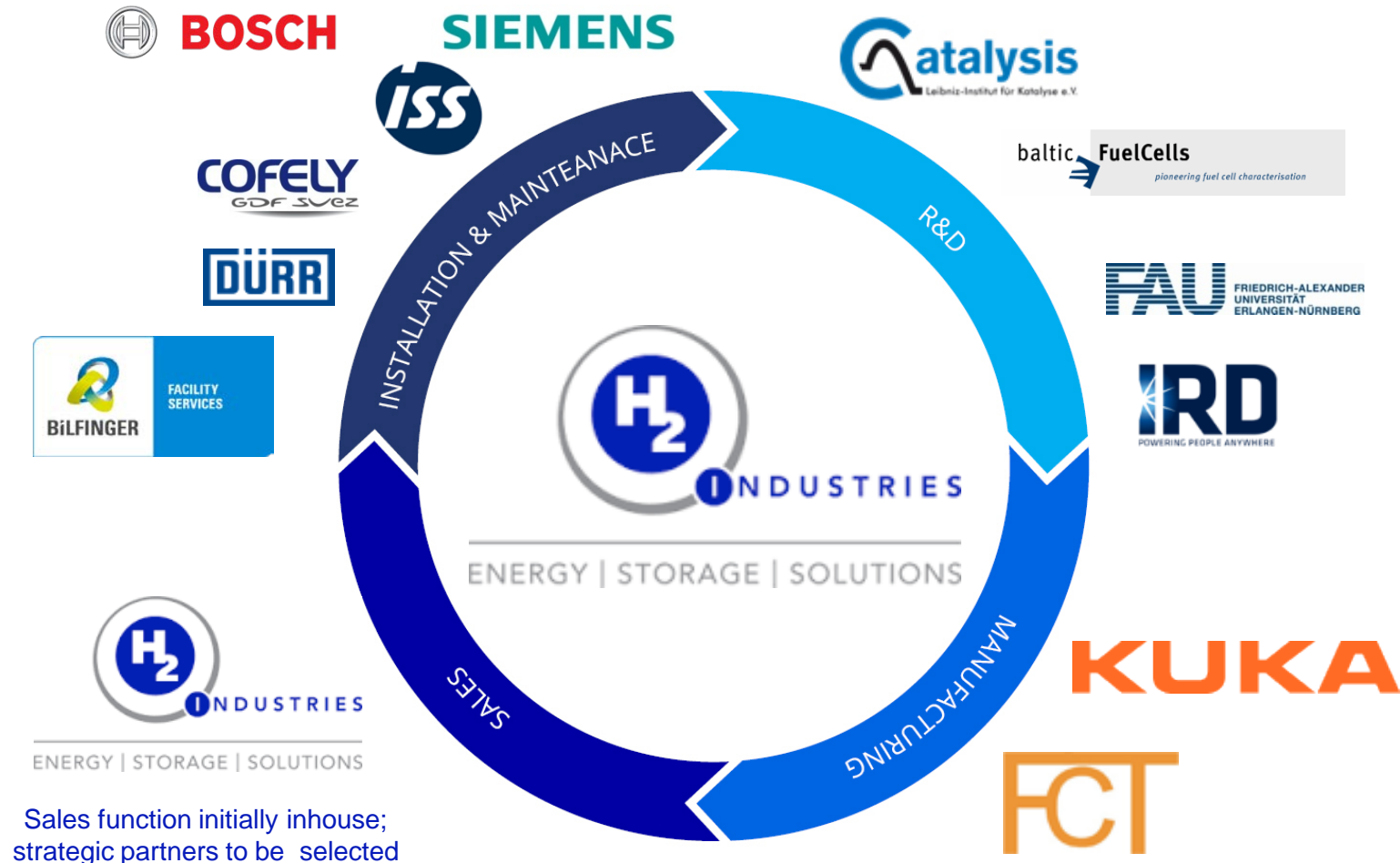
LOHC RELEASE



H₂-Industries' energy storage solutions is based on two separate processes namely the loading (hydrogenation) and unloading (dehydrogenation) of a liquid energy carrier. This liquid is an organic molecule showing similar physic-chemical properties to diesel. The hydrogen stored in this liquid is chemically bonded giving the great advantage to store it under ambient conditions (p=1bar, normal temperature) without suffering any self-discharge or the loss of hydrogen. One liter of the energy carrier can store an equivalent of 2 kWh thermal energy or, after reconversion, 1 kWh electrical energy.



HYDROGEN CAN BE STORED SAFELY UNDER AMBIENT CONDITIONS AND DOES NOT SELF-DISCHARGE



H₂-INDUSTRIES HAS ASSEMBLED A TOP NOTCH TEAM OF REPUTABLE NAMES FOR MANUFACTURING, INSTALLATION AND MAINTENANCE WHILE R&D AND SALES WILL BE PROPRIETARY TO H₂-INDUSTRIES

SAFE &
CLEAN



HIGH
ENERGY
DENSITY



MODULAR
&
SCALABLE



UNLIMITED
STORAGE
CAPACITY



HEAT,
COOLING,
FRESHWATER



USABLE
WITH EXISTING
INFRASTRUCTURE



LONG-TERM
STABLE &
RECHARGEABLE



UNRIVALLED
PRICE



USP: BASED ON LOHC H₂ INDUSTRIES HAS DEVELOPED A PRACTICAL SOLUTION WITH UNMATCHED COST ADVANTAGES



COMPARISON OF KEY STORAGE TECHNOLOGIES

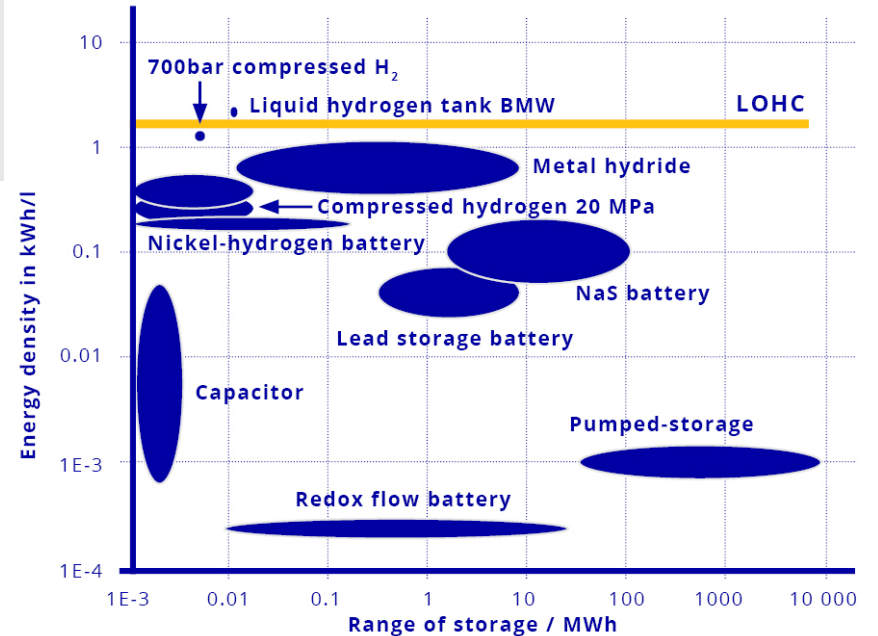
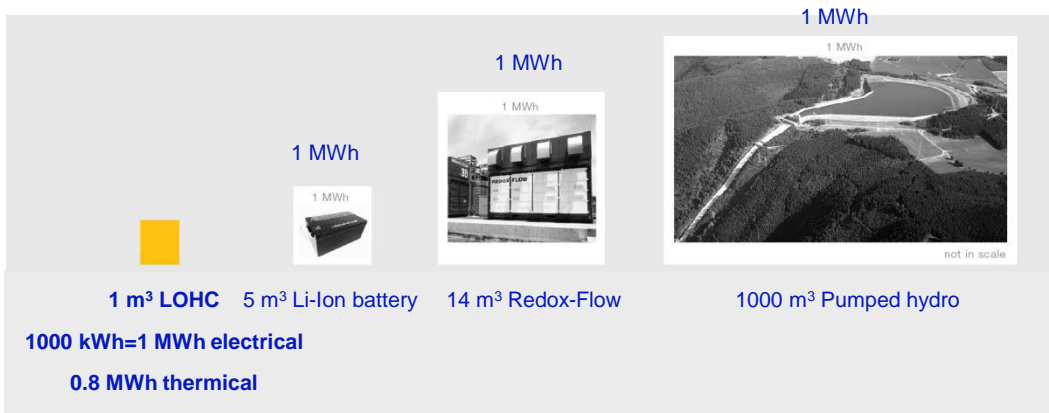
Technology	Energy density (kWh/l)	Range of storage			Fields of application		Long-term storage stability
		0-0.01	0.01-10	10-1,000	Stationary	Mobile	
LH ₂ ⁽¹⁾ -253°C	2.36	✓	✗	✗	✓	✓	✗
LOHC	2.0	✓	✓	✓	✓	✓	✓
GH ₂ ⁽²⁾ 700 bar	1.85	✓	✗	✗	✓	✓	✓
GH ₂ ⁽²⁾ 200 bar	0.53	✓	✓	✗	✓	✗	✓
Li-ion battery	0.46	✓	✗	✗	✓	✓	✗
Pumped storage power	0.001	✗	✗	✓	✓	✗	✓

Note: 1 Liquid hydrogen
2 Gaseous hydrogen

LIQUID ORGANIC HYDROGEN CARRIER (LOHC)

- 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

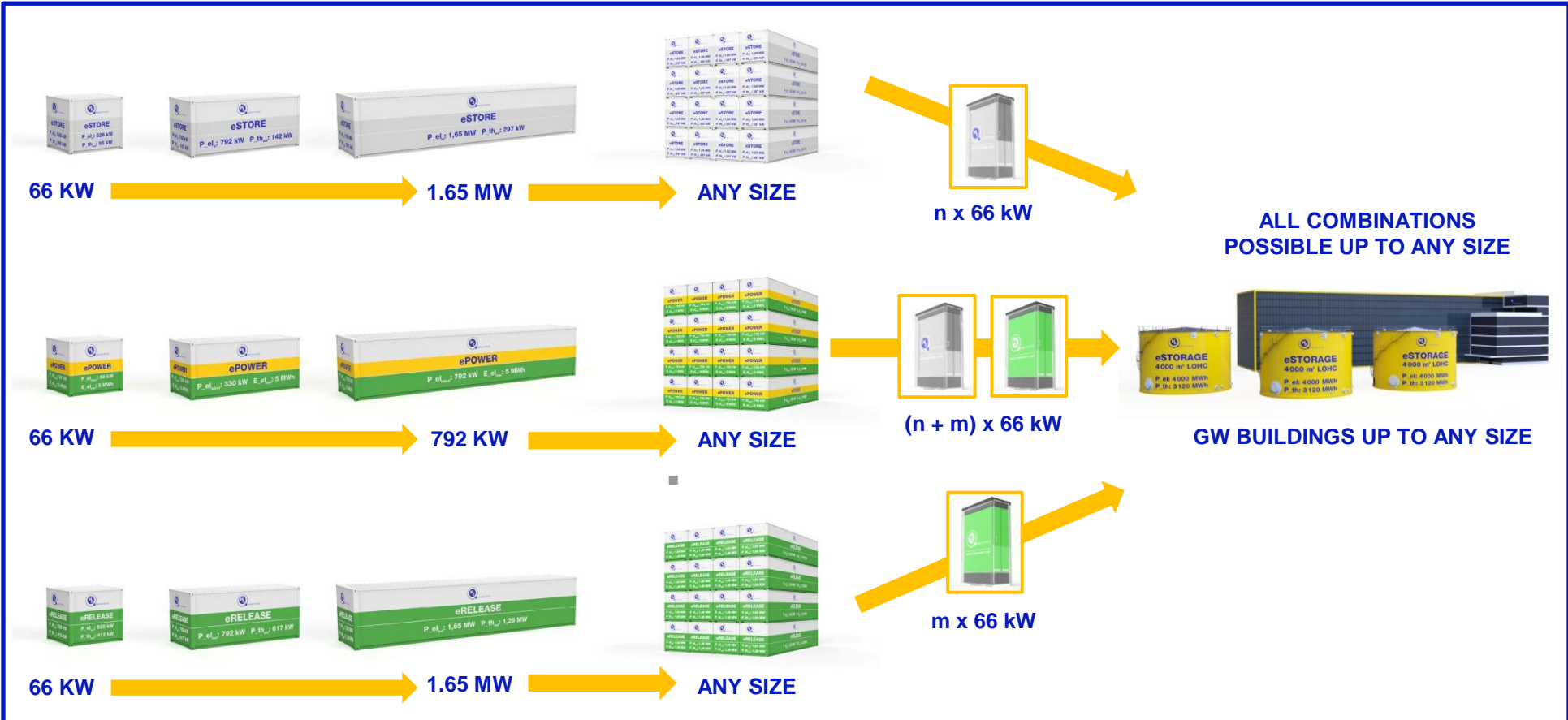
VOLUMETRIC DENSITY: 1kWh ELECTRICAL ENERGY



LOHC SYSTEMS ARE CHARACTERIZED BY A DECOUPLED STORAGE AND POWER DENSITY COMPARED TO CONVENTIONAL HYDROGEN STORAGE TECHNOLOGIES



H₂-INDUSTRIES WILL BUILD MODULAR COMPONENTS FOR ALL BUSINESS APPLICATIONS

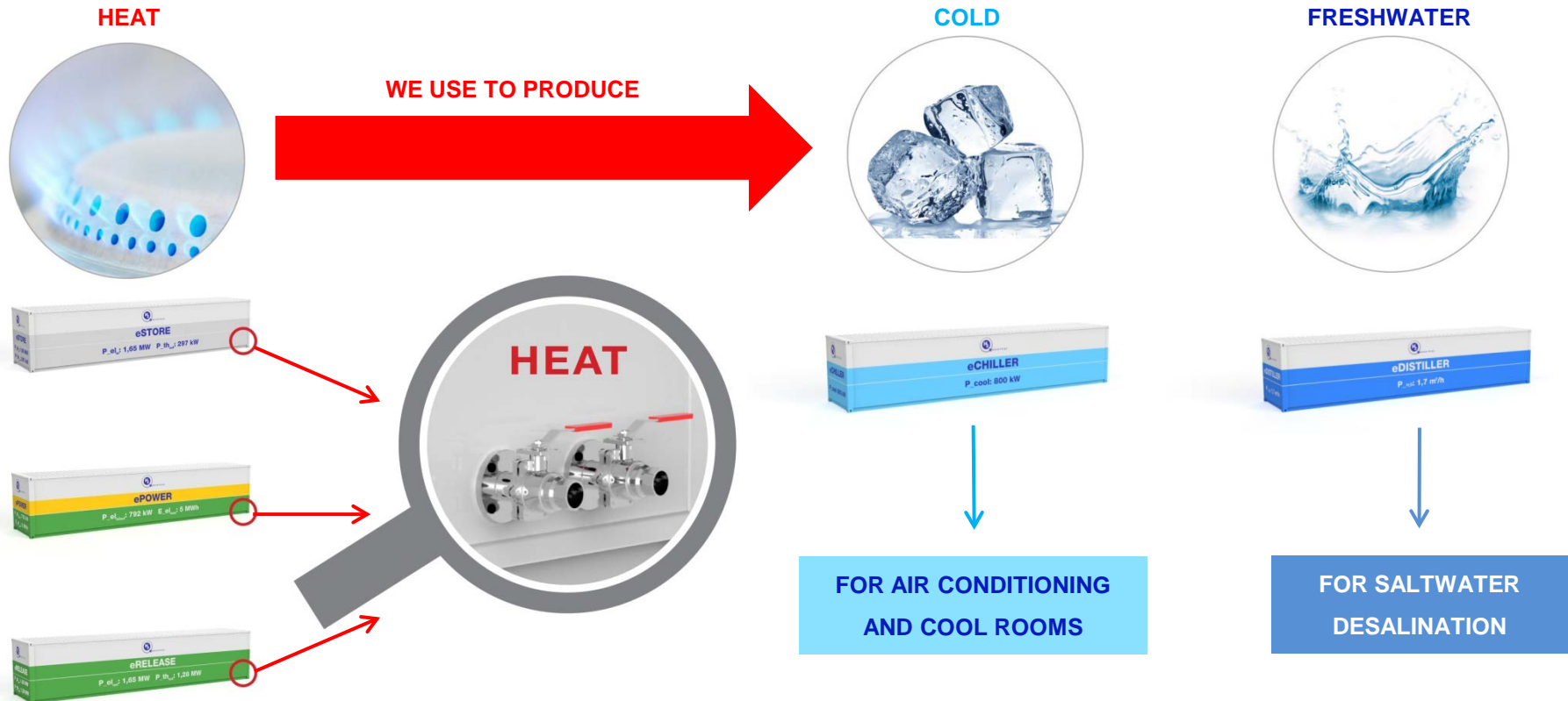


THE LOHC'S MODULAR STRUCTURE FACILITATES CUSTOMIZED SOLUTIONS TO MAKE RENEWABLES RELIABLE – ANYTIME, ANYWHERE, ANY SIZE





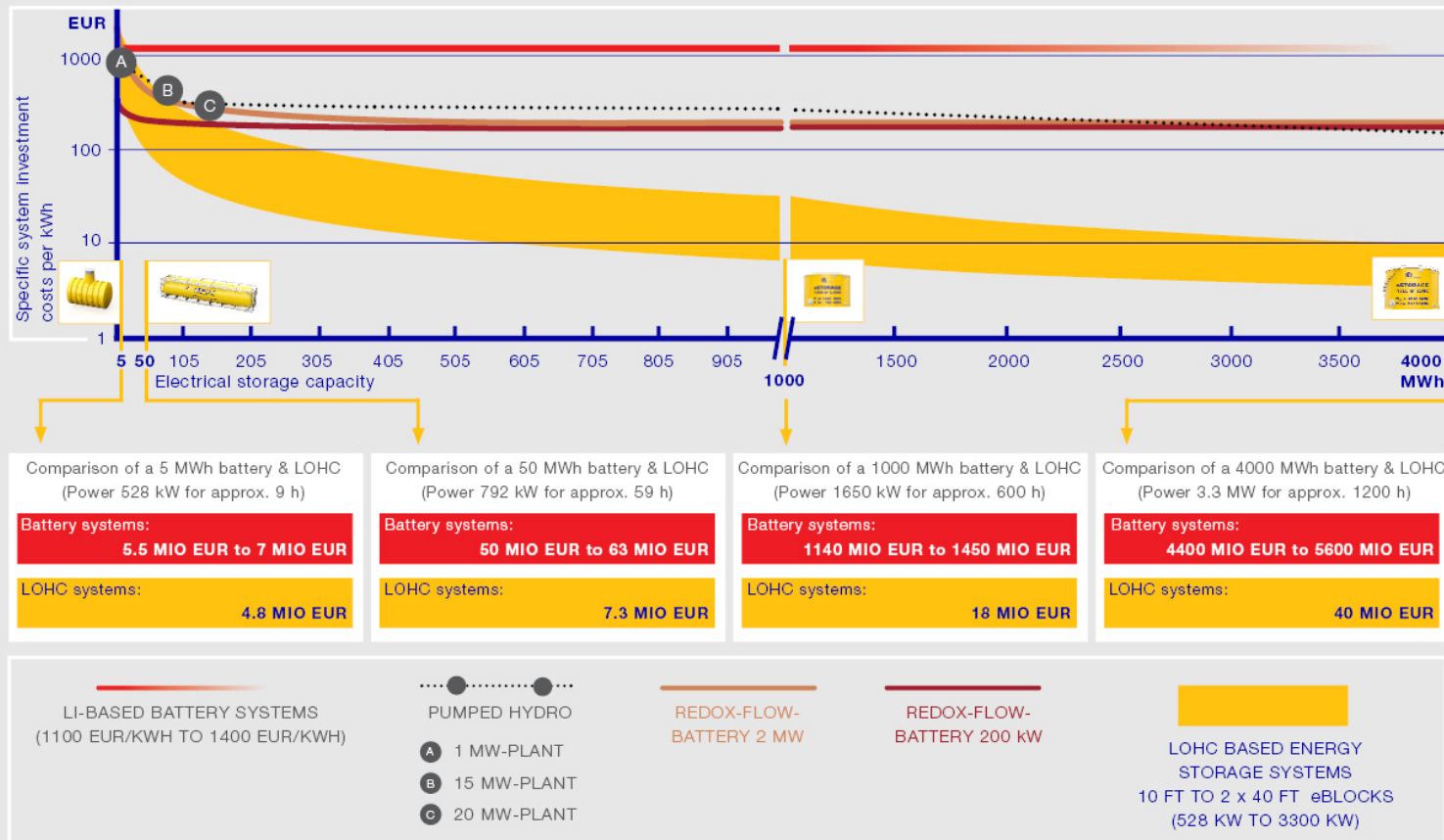
A BY-PRODUCT OF THE eRACK PROCESS IS HEAT, WHICH CAN BE USED TO PRODUCE FRESHWATER FROM SALTWATER, TO HEAT ENTIRE BUILDINGS OR TO RUN ABSORPTION REFRIGERATORS (AC'S)



➔ H₂-INDUSTRIES SOLUTIONS NOT ONLY COVER ENERGY STORAGE AND ENERGY TRANSPORTATION, BUT ALSO FACILITATE OFF-GRID DESALINATION AND COOLING APPLICATIONS (AIR CONDITIONING, REFRIGERATION)



PRICE COMPARISON OF STORAGE SYSTEMS & LOHC eBLOCKS WITH FLEXIBLE STORAGE CAPACITY



LOHC STORAGE SYSTEMS OF 5+ MWH STORAGE CAPACITY HAVE THE LOWEST CAPEX REQUIREMENTS...

ENERGY PRODUCTION & STORAGE



TRANSPORT BY TRUCK



TRANSPORT BY FULL TRAIN



TRANSPORT BY TRUCK

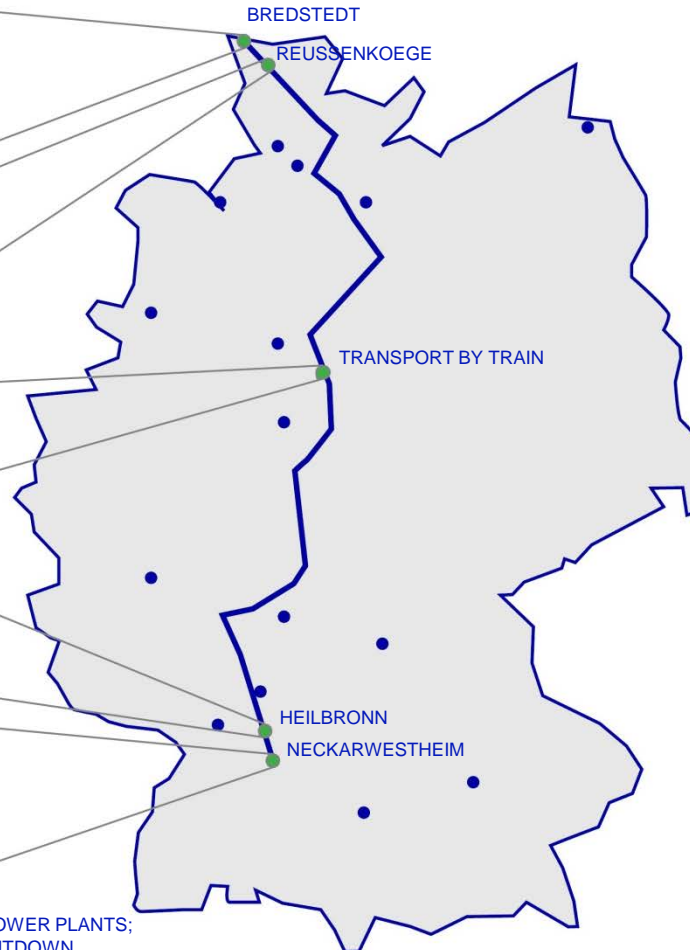


With 24 full trains per day the 1.350 MW energy storage building in Neckarwestheim can run on full capacity.

ENERGY RELEASE



● NUCLEAR POWER PLANTS; PARTLY SHUTDOWN



ONE PERFECT EXAMPLE TO SOLVE THE OVERPRODUCTION OF POWER IN THE NORTH AND THE UNDERDELIVERY IN THE SOUTH

The energized LOHC+ can be transported by truck and train from the windy North to the South, where power is needed.

1. Not used Power produced by windmills in Reussenkoewege/Schleswig Holstein is stored in LOHC in eSTORAGE 40 foot containers.
2. The eSTORAGE, filled with LOHC+ is transported by trucks to the next railway station in Bredstedt.
3. A train (full train) takes over 27 eSTORAGE containers (1,350 MWh) and transport them to Heilbronn.
4. Trucks transport the 27 eSTORAGE to Neckarwestheim, where they will be pumped in the 4,000m³ Silos.
5. The 1,350 MWh can be released from the H₂-Industries 1.35 GW building within one hour to the existing grid infrastructure from the formal nuclear power plant.

NO GRID EXPANSION NEEDED



EASILY ADJUSTABLE, DECENTRALIZED STORAGE SOLUTION AVOIDING GRID INFRASTRUCTURE INVESTMENT WHICH ARE POLITICALLY DIFFICULT TO IMPLEMENT



FOUNDER , CEO AND PRESIDENT

MICHAEL STUSCH



CFO

SVEN-ROGER VON SCHILLING



CTO

STEPHAN MÖLLER



CSO

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