

# Hydrogen Flagship Project H<sub>2</sub>Giga: Serial Production of Electrolysers

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# H<sub>2</sub>Giga

H<sub>2</sub>Giga is dedicated to R&D on industrialization and scale-up of water electrolysis – a precondition to make green hydrogen available on gigawatt scale.



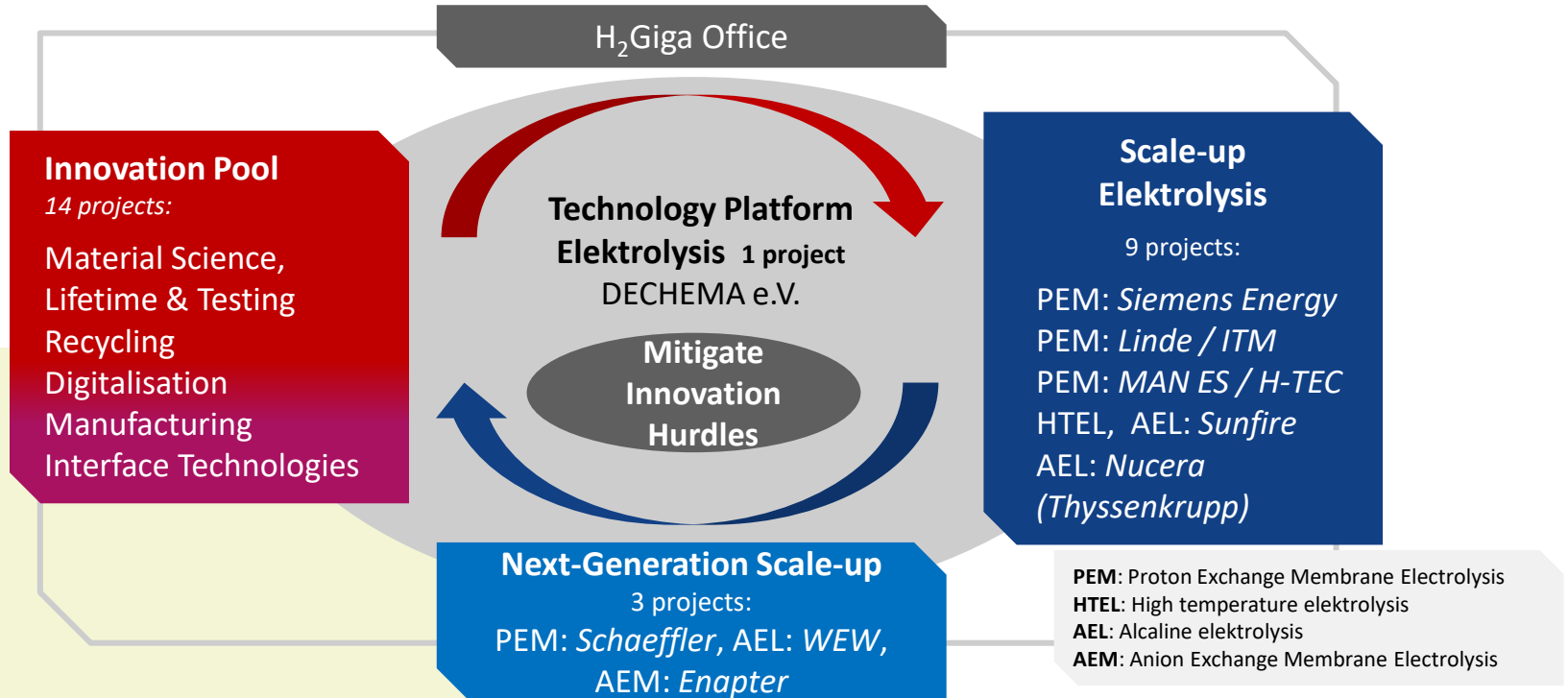
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# H<sub>2</sub>Giga at a Glance (as of 03/2022)

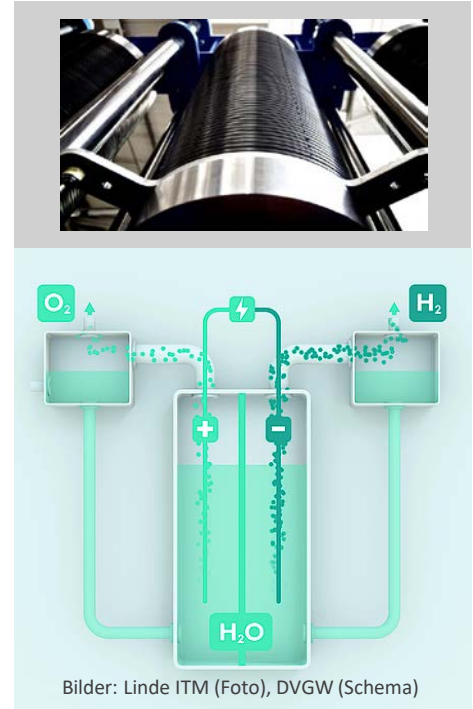
- ▮ **Participants:**
  - ▮ 27 joint projects (independent)
  - ▮ Approx. 120 partners
  - ▮ Partners from industry, SME's, start-ups, universities, research centres
  - ▮ One joint project is 'Technology Platform Electrolysis' = networking project in H<sub>2</sub>Giga, coordinated by DECHEMA e.V.
  - ▮ Hydrogen Flagship Projects are still open for new, matching joint projects or partners
  
- ▮ **Duration:** 4 years; from 4/2021 to 3/2025 (exceptions: to 9/2025)
- ▮ **Funding:** ca. 450 Mio. €

# Structure of Flagship Project H<sub>2</sub>Giga



# State of the Art and Project Goals

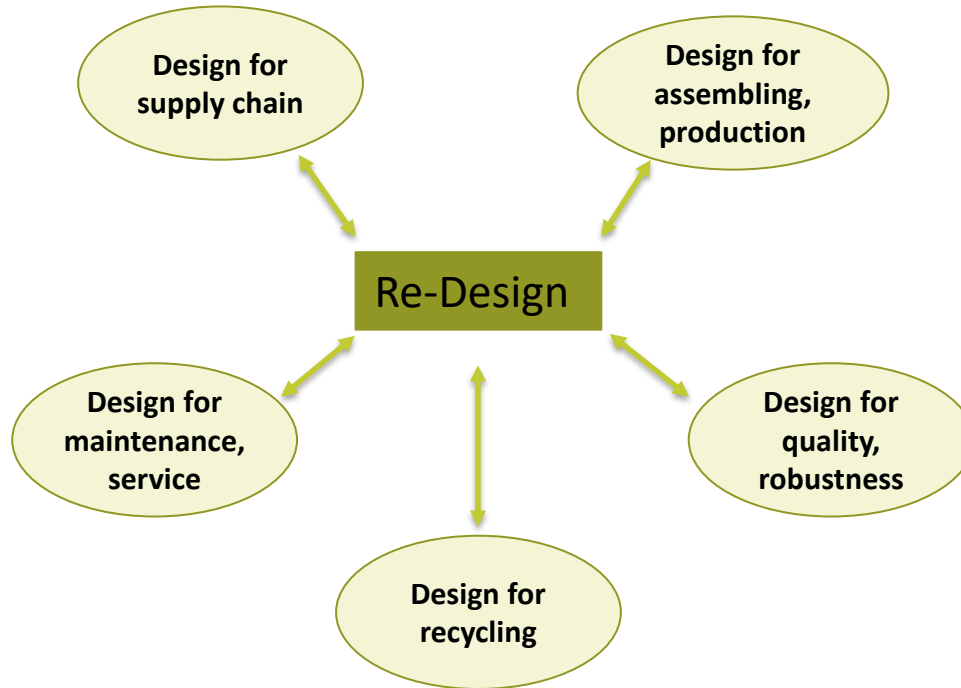
- Electrolysers are a mature technology, however ...
- For our mid-term needs of green hydrogen the capacity of electrolysers is far too low (> factor 50)
- Today crucial steps of electrolyser production contain hand processes, are not automated, causing low throughput, compromised consistency, high cost
- **H<sub>2</sub>Giga develops technologies enabling production of electrolysers on an industrial scale**



# Platform for Manufacturers, Suppliers and Research Partners

- ▮ **Goal:** Develop technologies for industrialization and scale-up of water electrolysis to achieve gigawatt scales / year installed electrolysers
  
- ▮ **R&D topics in the 27 H<sub>2</sub>Giga joint projects:**
  - ▮ Design for production
  - ▮ Manufacturing & robotics
  - ▮ Digitalization, digital twin
  - ▮ Material development
  - ▮ Lifetime & cell testing
  - ▮ Recycling
  - ▮ Regulatory, standardization
  - ▮ Training
  - ▮ Interaction Industry & Research
  - ▮ Communications, PR
  - ▮ Technology Roadmap for industrialization of water electrolysis

# Re-Design of Core Components: *Design for Production*



# Generic Examples for ‚Design for Production‘

- ▮ Re-design of core components with respect to producibility
- ▮ Improvement of process robustness, safe process window (e.g. dimensional tolerances of MEA, plates, gaskets, ...)
- ▮ Pre-assembled sub-units, loss protection during assembling
- ▮ Optimization of membranes, electrodes for pick-up and release in automated assembling units (e.g. surface properties, gas permeability)
- ▮ → *Design for production is a very important topic!*
- ▮ *membrane electrode assembly (MEA)*



# TPE: Technology Platform Electrolysis

## Training

- PhD students
- Hackathon
- Training on the job

## H<sub>2</sub>Giga Joint projects

- Transfer meetings: research – industry
- Working Groups AG1-7

## Networking

- Linkando

## Communications, PR,

- Fairs, social media, press...

## Annual H<sub>2</sub>Giga Status Conference

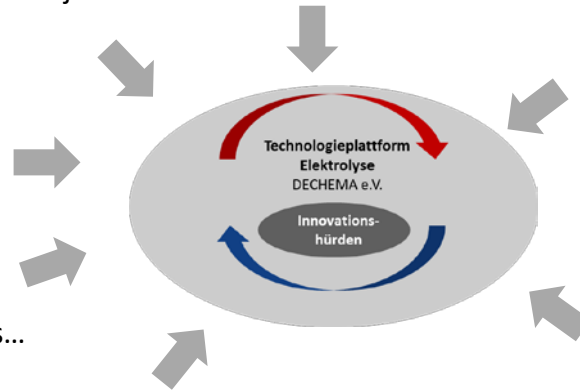
- H<sub>2</sub>Giga Partners
- H<sub>2</sub> Basic Research Projects (GLF)
- Guests from H<sub>2</sub>Kompass, H<sub>2</sub>Mare, TransHyDE

## Regulatory, Standards

- Operating licences
- Testing standards

## H<sub>2</sub>-Kompass, H<sub>2</sub>Mare, TransHyDE, NWR:

- Interface to complementary projects
- Expert interviews
- AG7 (H<sub>2</sub> Implementation)



\*) examples, not complete

# Get in touch

- ▮ Want to get in touch with our project partners?
- ▮ Fill out our contact form and share what you are looking for or would like to offer
- ▮ contact us at: [h2giga@dechema.de](mailto:h2giga@dechema.de)

*Thank you!* 😊

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