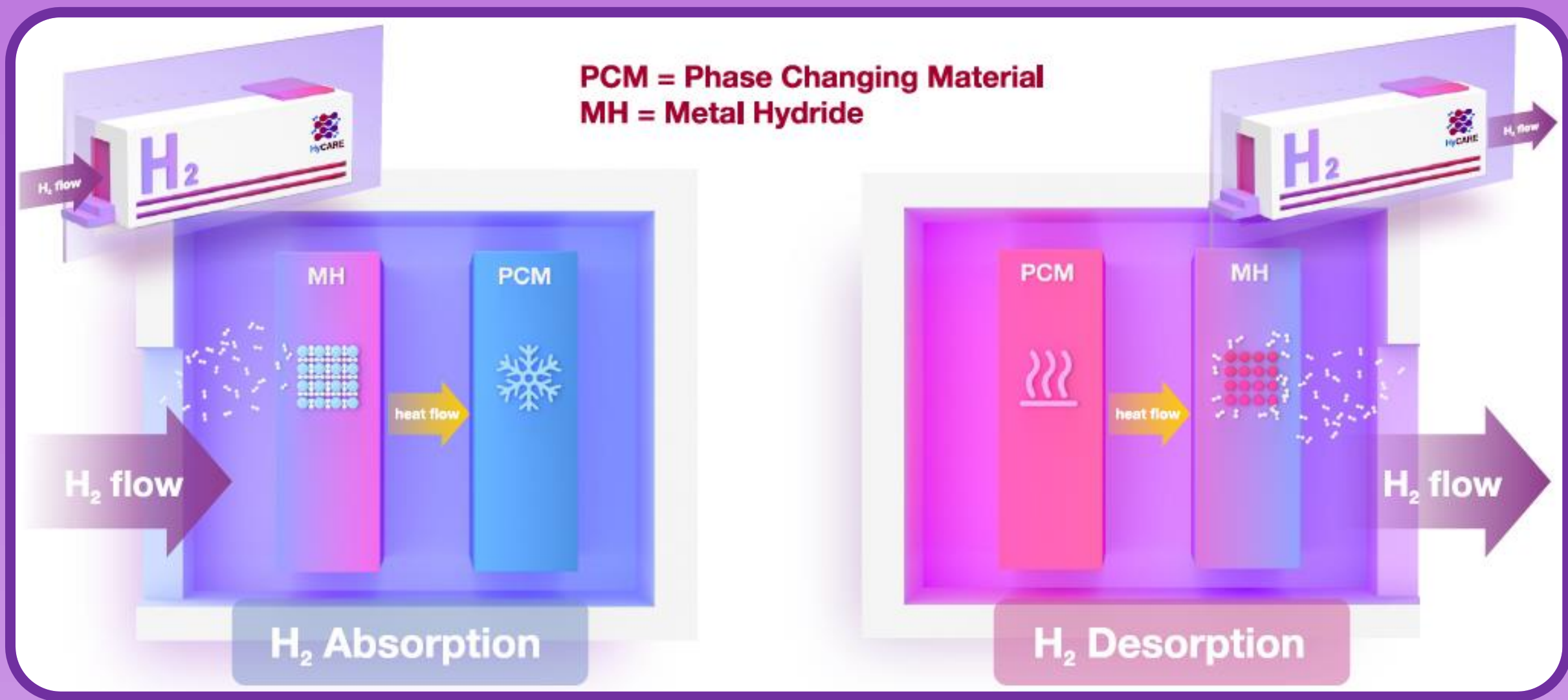




The HyCARE project aims at designing, developing and testing a hydrogen storage tank with use of a solid-state hydrogen carrier in large scale.



The tank is based on an innovative concept that couples hydrogen and heat storage for stationary storage of the excess renewable energy.

The HyCARE concept is based on four key elements:

RENEWABLE ENERGY



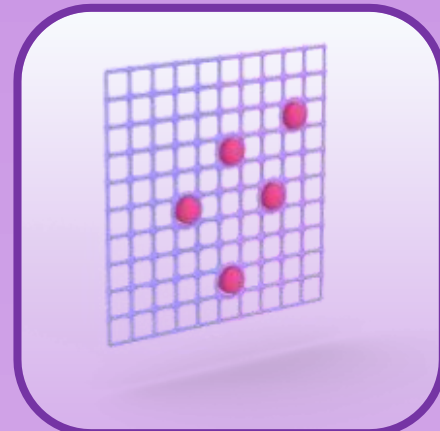
wind, solar and hydroelectric energy to be used as alternative sources for carbon-free energy systems

HYDROGEN



an energy carrier produced from other energy sources for long-term storage of renewable energy

METAL HYDRIDE

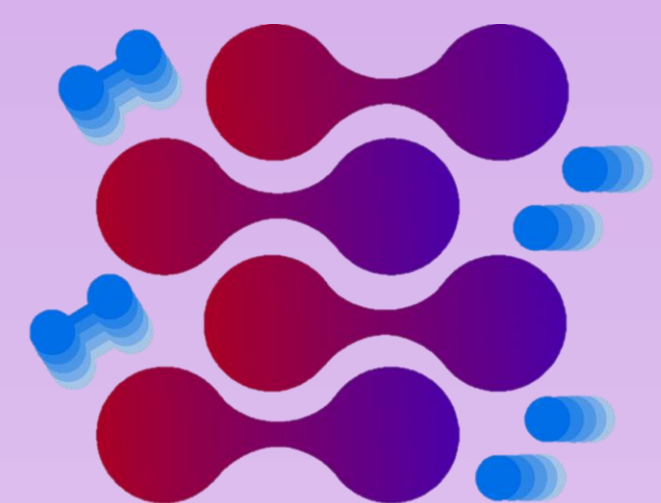


for absorbing and releasing hydrogen under moderate pressure and temperature

PHASE CHANGING MATERIALS



for managing heat due to hydrogen sorption and desorption in metal hydrides



Erika M. Dematteis, Jussara Barale, Mattia Costamagna, Paola Rizzi, Marcello Baricco, Camel Makhloufi, Nils Bornemann, Bettina Neumann, Carlo Luetto, Holger Stühff, Matteo Testi, Chiara Pellegrini, Luigi Crema, Giovanni Capurso, José M. Bellosta von Colbe, Klaus Taube, Bjorn Hauback, Monica Risso, Sabina Fiorot, Davide Damosso, Fermin Cuevas, Michel Latroche

Hydrogen CArrier for Renewable Energy storage

to demonstrate on a large scale hydrogen capacity to harness power from renewable and support its integration into the energy system

We care about:

• Clean Transport

• Green H₂ Production

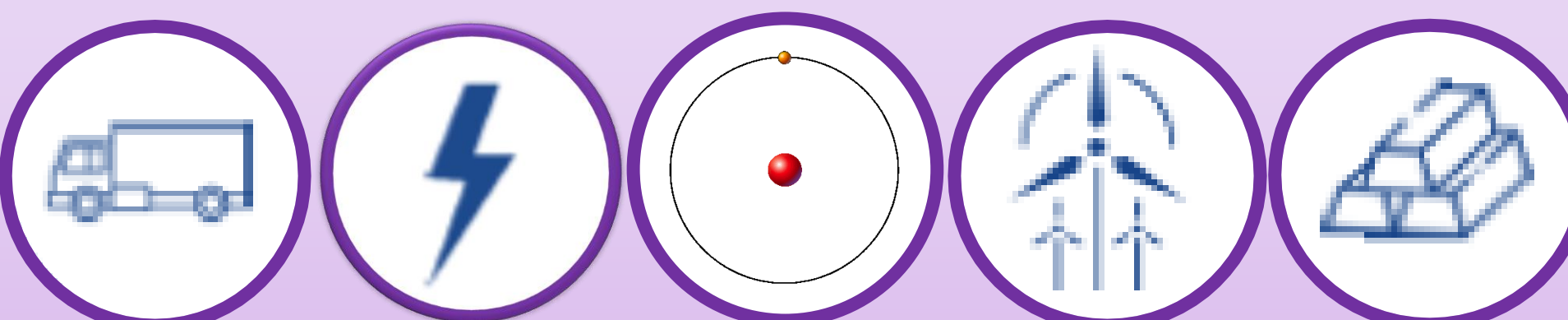


• Heat & Electricity Production

• H₂ Storage for Grid Balancing

• Low Critical Raw Materials

<http://hycare-project.eu>



Follow Us!

The tank will be installed in the site of ENGIE Lab CRIGEN in 2021

HyCARE will be integrated to renewable energy, a PEM electrolyser and a PEM fuel cell

Quantity

50 kg H₂

High quantity of stored hydrogen

Safety

<30 bar

Low pressure storage

<70 °C

Low temperature storage

Efficiency

<70 %

Total round trip energy efficiency

Environmental Impact

<5.0 kWh/kg H₂

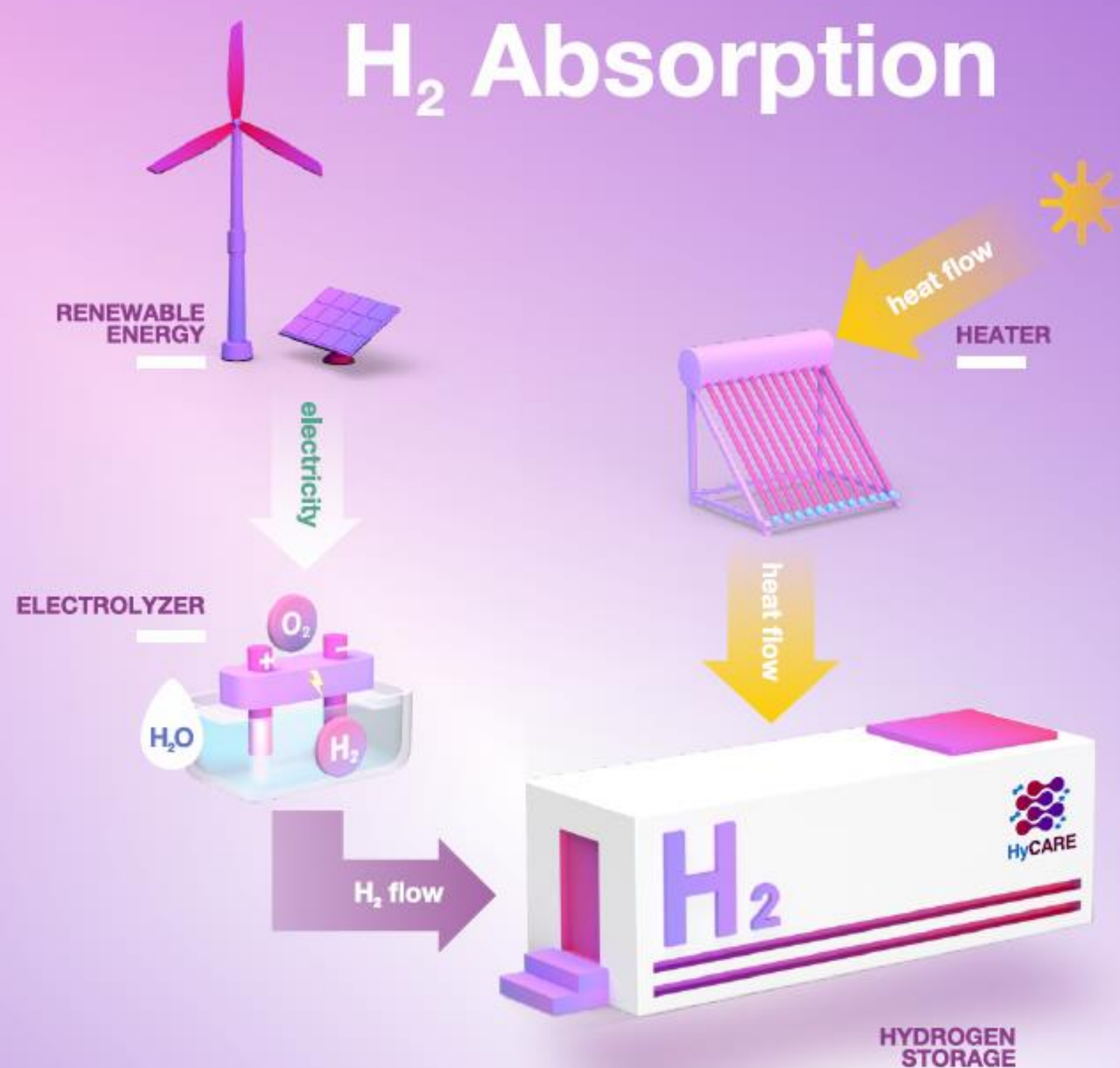
External energy source with innovative design for large scale storage, and use of non critical raw material

Cost

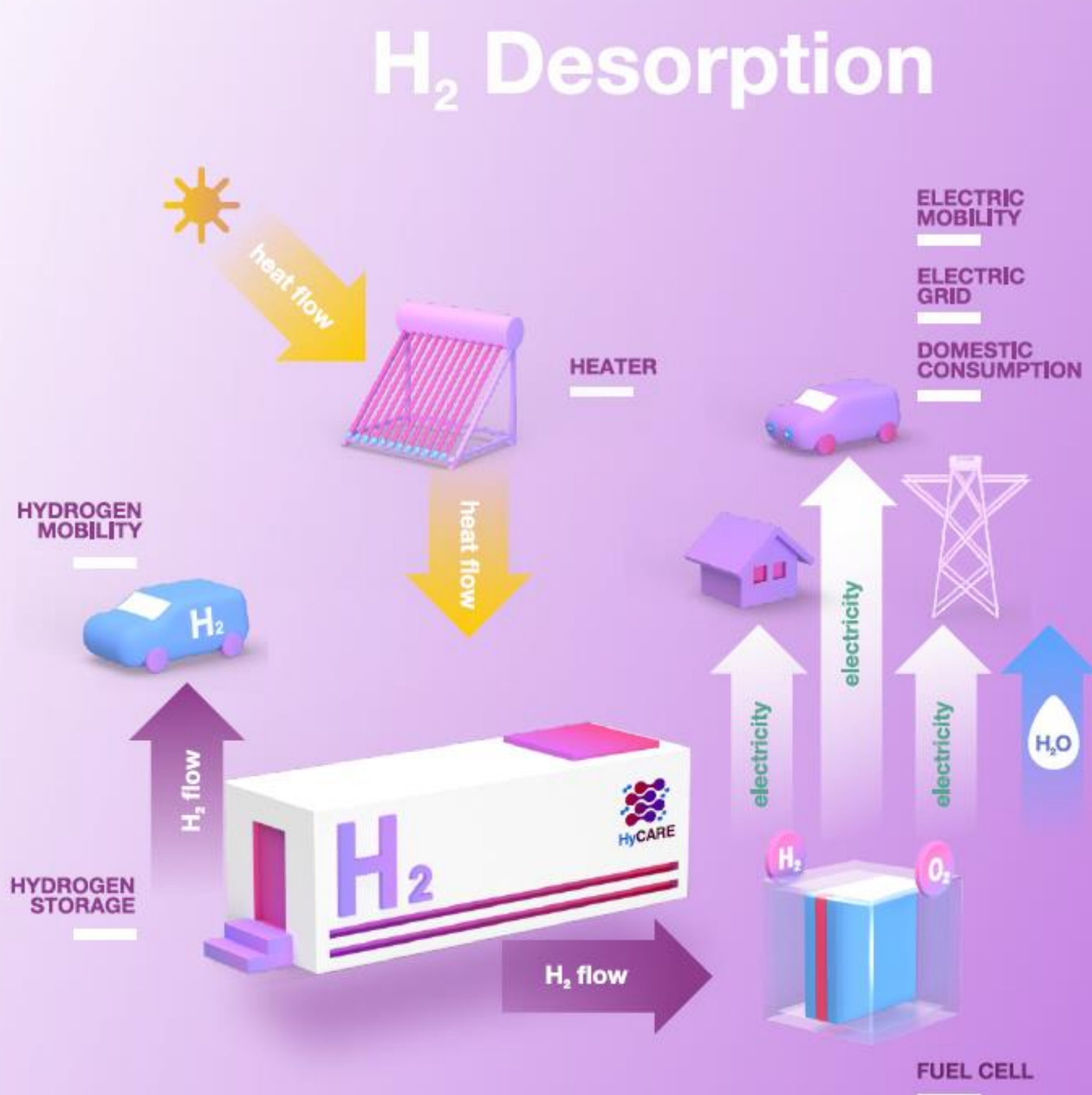
Lower

Activation time, material degradation, need of purification system

H₂ Absorption



H₂ Desorption

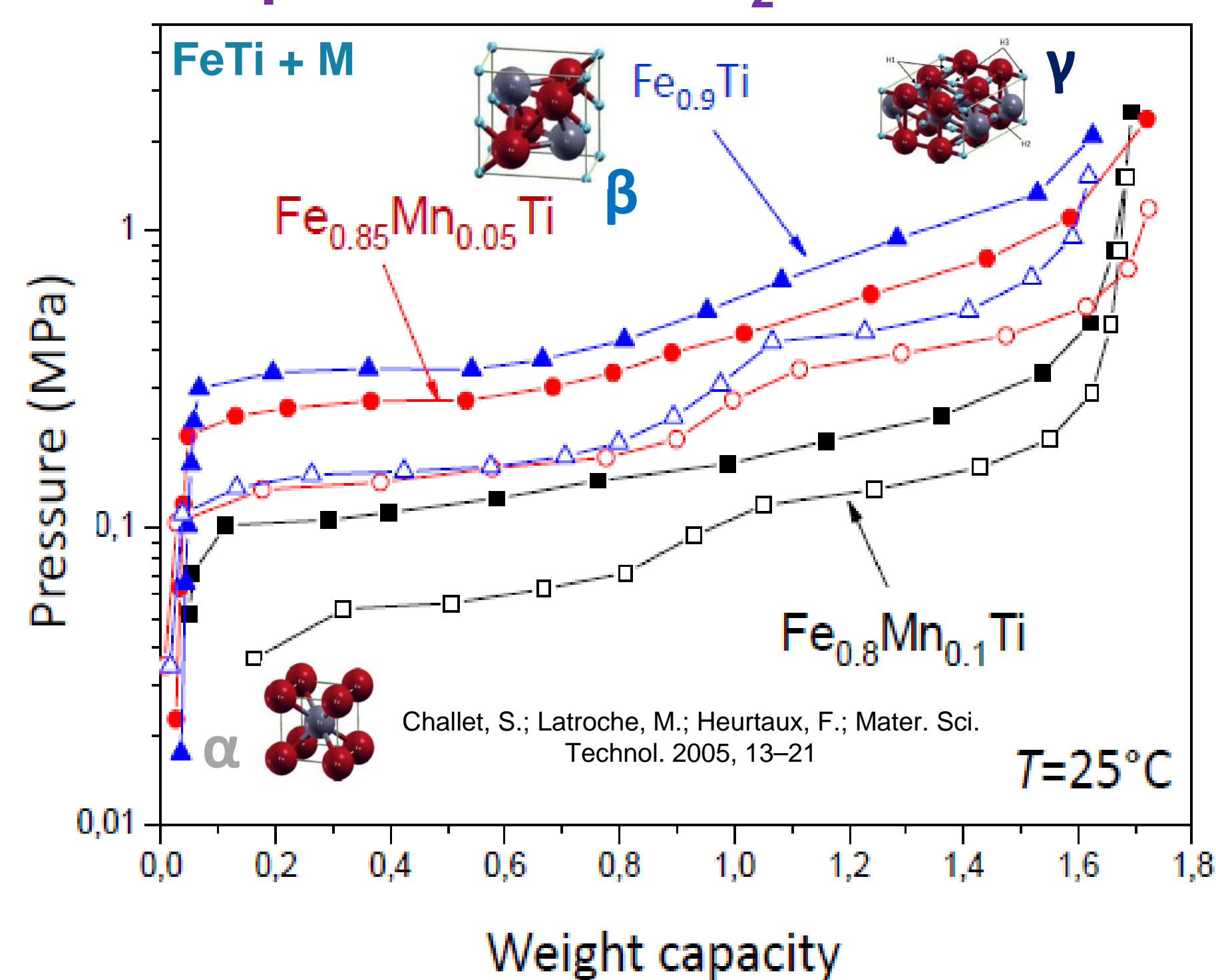


FeTi-type alloy



Organic PCM

Optimization of H₂ Carrier



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