



EDEN project

Illustrations and communication material *(selection labelled for non-commercial reuse)*

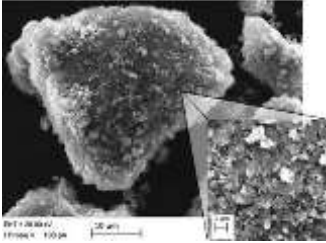
30 June 2016

Project acronym: **EDEN**

Project full title: High **E**nergy **DEN**sity Mg-Based metal hydrides storage system

Grant Agreement no.: 303472

OBJECTIVES ACHIEVED



Development of H₂ storage material in form of Mg-based metal hydrides nano-composites, with high H₂ uptake capacity, improved of catalyst layers.



Development of a high reliable storage tank for the specific proposed material.



Integration of additional sub-components for the improvement of the efficiency profile (i.e. heat recovery system through thermal fluid and/or by thermo electric device)



Integration with a SOFC for compatibility with the realized process in order to realize and test an integrated system for stationary, portable and stand-alone applications



Market Deployment Plan for high volume industrial production of units for distributed applications

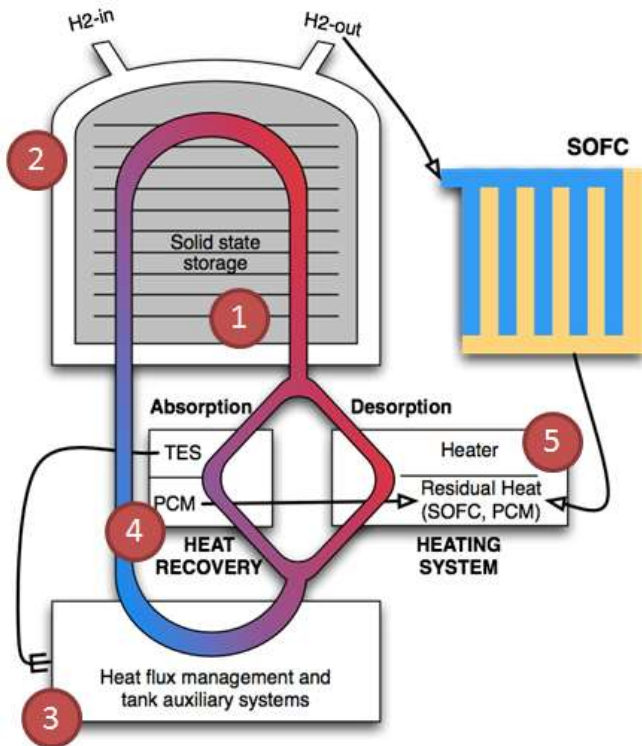


EDEN logo identity

The EDEN logo has been designed having in mind the European flag: 28 small hydrogen molecules coloured in yellow like the stars in the EU flag represent the 28 EU member state, while the main color of the EDEN lettering is in blue. Moreover the ED letter of the logo has been designed to refigure the absorbing material, stacked in planar layer and confined in the EDEN tank. The hydrogen molecules outside the ED recall the position of the stars in the flag, while the hydrogen molecules within the ED recall the action of store hydrogen in a medium.



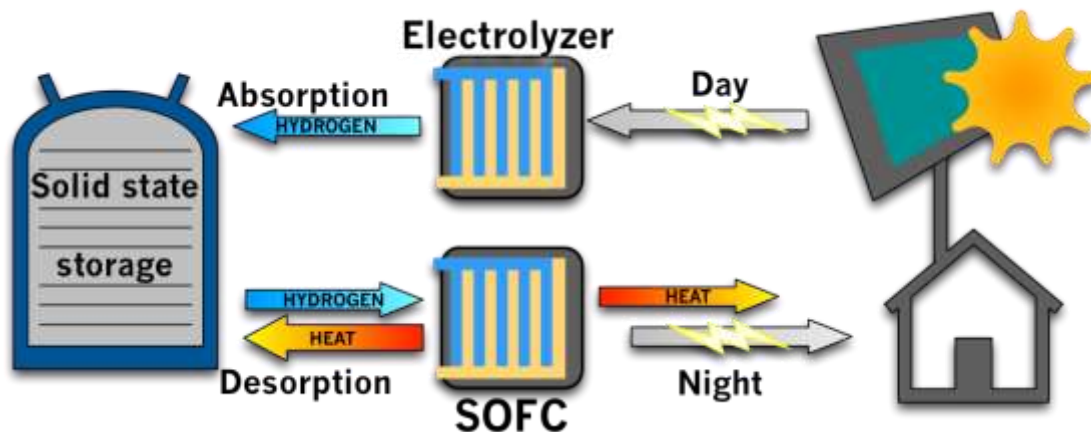
EDEN concept



EDEN realizes a full scale prototype composed by a storage tank, a SOFC operating in reversible mode and an overall integrated system provided of fuel and thermal management in a full P2P energy system.

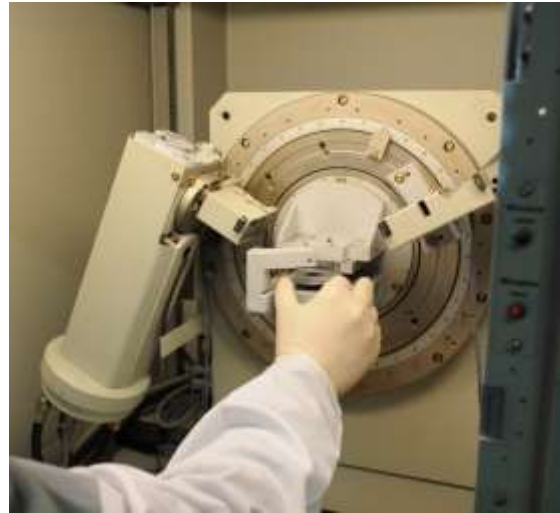
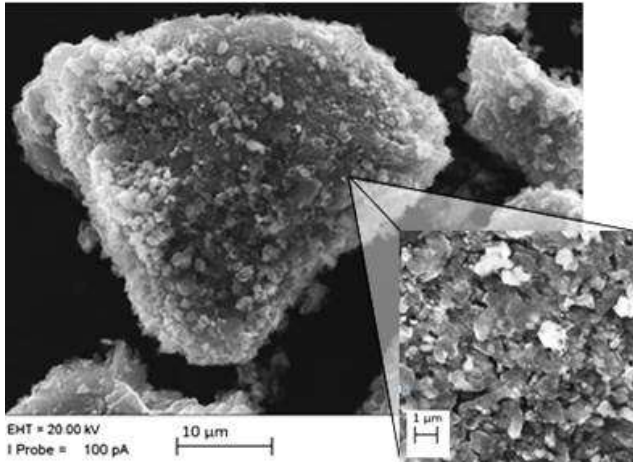
The system architecture will combine five main sub-systems:

- 1) The storage material, compacted in pellet with specific design
- 2) A light, thermal insulated tank
- 3) The heat flow managing system, heat carrier and pumps
- 4) The heat recovery system, equipped by TES and PCM (active during hydrogen absorption)
- 5) The heating system (active during hydrogen desorption) connected with the SOFC

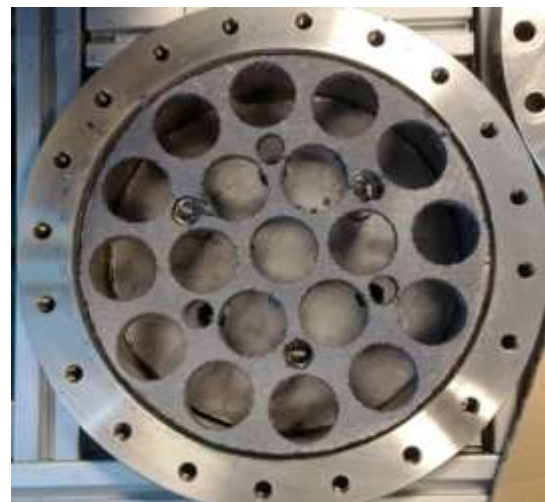
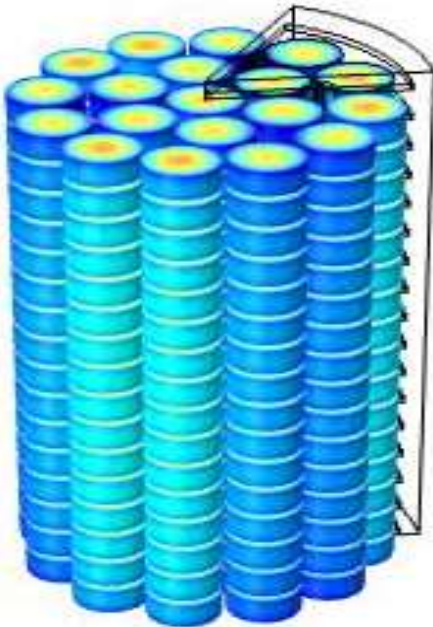
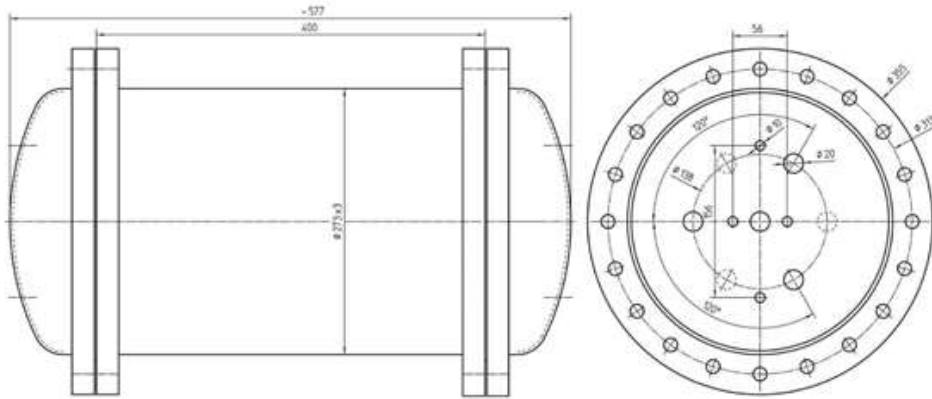


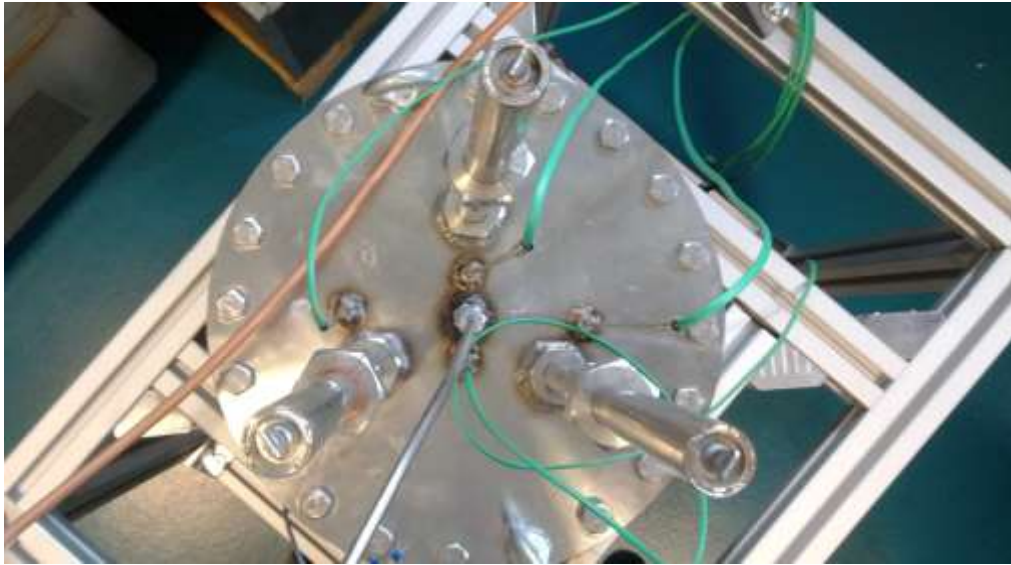
EDEN photos

Mg based storage material



EDEN tank



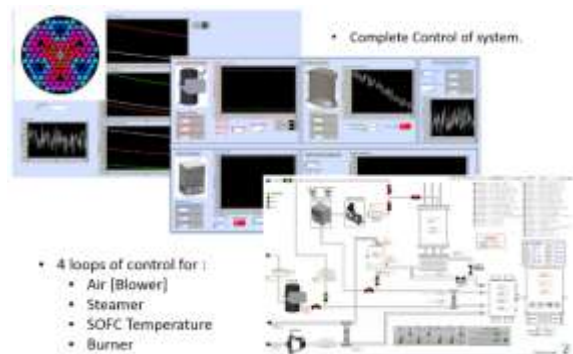


P2P system prototype



ELECTRONIC BOX

POWER BOX



Dissemination Events



EDEN media

TV show “Dedalo” on Ada Channel: <https://www.youtube.com/watch?v=TdLuMaMxEtE>

TV reportage on Italian National Television (RAI)

<http://www.rai.tv/dl/RaiTV/programmi/media/ContentItem-eb022fa3-45a6-4e2...>

TV reportage on Italian National Television RAI – TGR Trentino – Alto Adige

<http://www.rainews.it/dl/rainews/TGR/basic/PublishingBlock-5a42b960-0dad-41fe-b247-d807b49a470f.html>

TV reportage on Italian Regional Television RTTR – TG

<http://www.radioetv.it/rtrr/programmi/item/29-rtrr-notizie#monitor>

Full updated list available on EDEN official website

PROJECT BROCHURES AND BRANDING

Technical Leaflet

The project

Development of an integrated solid state hydrogen system able to manage generation, storage and utilization for small to medium scale, stationary applications at high efficiency

Material development **Task design** **System integration**

- Regenerant based material produced by high energy ball milling
- Enhanced kinetics of the material using the hydrogen by volume expansion technique engineering
- Compact storage material using a coating phase that limits the volume expansion
- Recover the heat produced during hydrogen absorption by (U) and (M)

Design and modeling of the tank as following procedure:

- Acquisition of material behavior
- Modeling of engineering and physical aspect of the tank
- Validation and optimization

The system architecture will combine 4 interesting:

- The storage material compacted in pellet with specific design (size, thermal insulated tank)
- The heat flow managing system, heat carrier and power
- The fuel recovery system, equipped by SO and PEM (solid oxide fueling hydrogen separator)
- The heating system (water-dividing hydrogen desorption) connected with the SOFC

TARGETS

STORAGE DENSITY: 4.7% w/w
VOLUME DENSITY: 34 g/L
WGA FROM H₂O: 2.5 g/wg

TARGETS

STORAGE DENSITY: 4.5% w/w
VOLUME DENSITY: 40 g/L
WGA FROM H₂O: 1.5 g/wg

TARGETS

WGA FROM H₂O: 2.5 g/wg

WHY EDen ?

Integration	Validation	Scenario
<p>new approach to make an overall production-storage-generation system, composed of an innovative material, advanced storage tank and innovative design with solid oxide fuel cell technology. New solutions are envisaged to properly and efficiently realize an integrated solution able to handle environmental and variable energy sources with demand side management</p>	<p>Each single developed in EDen is planned to be validated. Several methods will be used along a path able to realize the final integrated technology: modeling, laboratory testing, pilot and full scale prototypes, certification.</p>	<p>EDen technology is part of a smart energy production, energy storage and generation with a major role in the real energy supply. Before wider market penetration of decentralized and various energy sources will create a response with demand of energy by end users. Where EDen technology can be an answer to such a problem and further issues.</p>

THE PARTNERS

Project Brochure

High Energy DENSITY Mg-Based metal hydrides storage system

EDen is developing an integrated system for stationary energy storage.

Energy storage

Daily Energy Consumption

WGA FROM H₂O: 2.5 g/wg

WGA FROM H₂O: 1.5 g/wg

WGA FROM H₂O: 2.5 g/wg

Dissemination Postcards



EDEN WEBSITES

<http://www.h2eden.eu/>

EDEN OFFICIAL WEBSITE

The website of the EDEN project was published in M3 and shows:

- A general introduction to the project, the objectives, the expected results, the milestones, the detailed description of the consortium, etc;
- Description of the possible application of the developed technology;
- A networking platform to get in touch with project partners in order to involve all the possible stakeholder in the project;
- Description of the consortium and FCH JU initiative;
- Downloadable material.

The website will remain available online until end 2017



<http://hydrogen.fbk.eu/>

EDEN FINAL DISSEMINATION EVENT WEBSITE



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