Partners

LNE – Le progrès, une passion à partager
CEM – Centro Español de Metrología
NPL – National Physical Laboratory
VSL – Dutch Metrology Institute
MAHYTEC – Innovative Energy Solutions
cea
AIR LIQUIDE – Creative Oxygen
SP – Science for your future
Ha – Foundation for the Development of New Hydrogen Technologies in Aragon
AREVA H_2Gen

Collaborators

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More info at
http://projects.lne.eu/jrp/Hydrogen

Contact information

Frédérique Haloua, PhD
frederique.haloua@lne.fr
+33 (0)1 30 69 32 57

Laboratoire national de métrologie et d'essais (LNE)
29 avenue Roger Hennequin
78197 Trappes Cedex, France

http://www.lne.eu

Hydrogen

a Joint Research Project

Hydrogen is a clean and storable solution that could meet the worldwide energy demands.

The Hydrogen project addresses the standardisation needs in the hydrogen-energy sector that meet the requirements of the European Directive on the deployment of Alternative Fuels Infrastructure 2014/94/EU in order to bring forward the standardization in R&D related to metrology.

The Hydrogen project expresses the new European policy objectives in the transport and energy sectors defined in the Horizon 2020 programme that encourages the decarbonisation of the transport sector.

EMPIR EURAMET

This work was funded through the European Metrology Programme for Innovation and Research (EMPIR) Project 15NRM03 Hydrogen. The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States.

This project aims at:

- ✓ evaluating the probability of hydrogen impurity affecting fuel cells and developing analytical techniques for traceable measurements of the hydrogen impurity (research axes for the revision of **ISO 14687-2**)
- ✓ developing and validating traceable methods to assess accurately the hydrogen mass absorbed and stored in metal hydrides (research axis for the revision of **ISO 16111**).

Technical objectives:

1. Develop hydrogen quality specifications for fuel cell vehicles, including **tolerance levels for impurities** in hydrogen and limits for the degradation of fuel cell performance as per **ISO 14687-2***.

A fuel cell vehicle refueling - Air Liquide

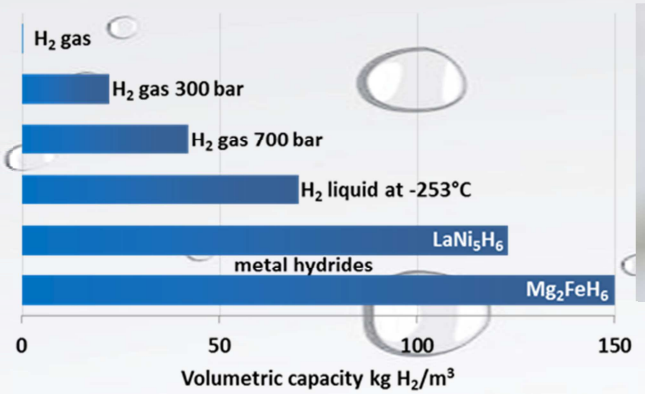
Proposal of **recommendations on maximum concentration of individual compounds** based on **fuel cell degradation studies** and on the **probability of presence** of the contaminants.


Stack assembly - CEA

2. Propose optimised analytical protocols including **fit-for-purpose analytical methods** and assess an analyser that enables the implementation of **ISO 14687-2**.

The **multicomponent** analyser will have **optimised sampling method** and **meet the required detection limits** as per business plans **ISO/TC 197** and **CEN/TC 268**.

Multicomponent gas analyser of ultra-trace impurities in H_2 - AP2E

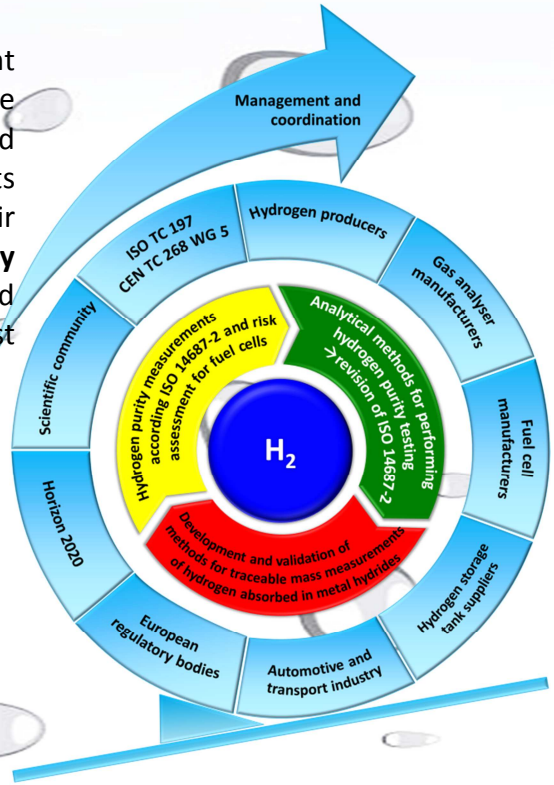



Tank and metal hydride - MAHYTEC

3. To develop and validate **traceable methods** for measuring **the hydrogen mass absorbed in metal hydride tanks** (hydrides AB, AB2 and AB5), with reference to **ISO 16111****

4. To contribute to the development of the standardization work within the technical committees **ISO/TC 197** and **CEN/TC 268** ensuring that the outputs of the project are aligned with their needs and are **communicated quickly** in a form that can be incorporated into the standards at the earliest opportunity.


Hydrogen storage tank made of metal hydrides - CEA



*ISO 14687-2 *Hydrogen fuel – Product specification – Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles*

**ISO 16111 *Developing transportable gas storage devices - Hydrogen absorbed in reversible metal hydride*