

# Welcome



FUNDACIÓN PARA EL  
DESARROLLO DE LAS NUEVAS  
TECNOLOGÍAS DEL HIDRÓGENO  
EN ARAGÓN



## EU Worskhop on Electrolysis: features, capabilities and projections



# WHY HYDROGEN IN ARAGON?

- First Wind Farm in Spain installed near Zaragoza
- 2003: Great energy change approaching
- Reasons to support new hydrogen technologies:
  1. To take advantage of the **renewable energy potential**
  2. To take advantage of the region's **strategic situation**
  3. **A consolidated industry** (sectors coupling/developing new products)
  4. Existence of a **high level of involvement in research groups**
- 2003: Workshop organized by Government of Aragon
  - Objectives:
    - To learn and to discuss about hydrogen as energy vector
  - Results:
    - **Strategy to develop Hydrogen technologies in Aragon**
    - **Foundation for the Development of New Hydrogen Technologies in Aragon**



# WHY HYDROGEN IN ARAGON - Hydrogen Master Plan in Aragón

## AIMS OF THE PLAN:

- **GENERALS**

- To have a tool for the identification of opportunities of the new hydrogen technologies
- To identify strategic lines for the region and to establish a time scale and actions

- **SPECIFICS**

- To review the state of technology and to define opportunities
- To identify specific projects for Aragón's SMEs
- To set across-the-board and general objectives
- To carry out a survey with SMEs to ensure the continuity of the strategic lines drawn

**TO PREPARE SME'S AND PROFESSIONALS FOR THE FUTURE**

Hydrogen  
Master Plan



(2011 – 2015)



(2016 – 2020)

(2007 – 2010)

# WHO WE ARE?

The Foundation for the Development of New Hydrogen Technologies in Aragon (FHA) is a private, not-for-profit entity, **created to promote the use of hydrogen as an energy vector.**

Research and Technological Development Center, key instrument for **the promotion of strategic projects** around the hydrogen, renewable energy, electric vehicles, energy efficiency. With the purpose of generating, storing and transporting hydrogen, for its use in fuel cells, in transport applications or for the generation of distributed energy.

FHA aims to foment research, technological development, cogeneration and industrial adaptation, contributing to **industrial modernization and improved competitiveness.**

**Created: December 23<sup>rd</sup> 2003**

First meeting of Board: May 25<sup>th</sup>, 2004





## ADMINISTRACIONES PÚBLICAS



## CORPORACIONES Y ASOCIACIONES



## ENERGÍA



Class management



## INMOBILIARIA Y OBRA CIVIL



## AUTOMOCIÓN



## INDUSTRIA QUÍMICA



## METAL MECÁNICO



## INVESTIGACIÓN, ENSEÑANZA E INNOVACIÓN



## INGENIERÍA Y CONSULTORÍA



## SEGURIDAD Y HOMOLOGACIÓN



## OCIO Y TURISMO



## ASOCIADO



## TRANSPORTE



## FINANZAS



## NOMINATIVO

Carlos Javier Navarro

## DE HONOR

Jeremy Rifkin  
Víctor Manuel Orera  
Emilio Domingo



## AeH2, Spanish Hydrogen Association

- **Board Members**



## APPICE, Spanish Association of Fuel Cells

- Secretary
- **Board Members**



## PTE HPC, Spanish Platform of Hydrogen and Fuel Cells

- **Board Members**



## AENOR

- Comité AEN/CTN 181: Tecnologías del Hidrógeno

## Clúster de la Energía de Aragón

- Founder Members





## HER, Hydrogen Europe Research (former Nerghy)

- **Board Members**



## HyER, Hydrogen Fuel Cells and Electro-mobility in European Regions

- Government of Aragon
- Founder Member
- Board Member



## CENELEC (Comité Europeo para la estandarización sector eléctrico)

- Working Groups:
  - Hydrogen Production
  - RCS

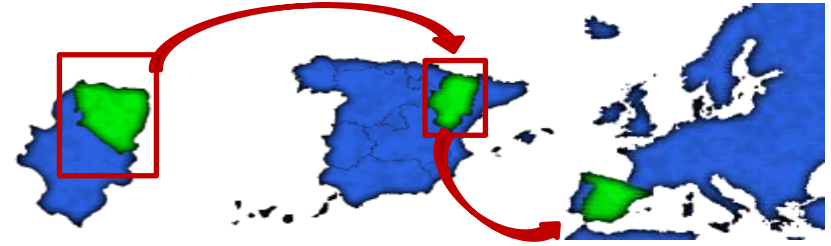


## IEA, International Energy Agency

- TASKs Participation
- Working Group Leader TASK 24
  - Integration of wind power and hydrogen
  - Participation of 9 countries

# Facilities and Infrastructures

- Location: **Walqa Technology Park, in Huesca**
- Building: Part of the Technological infrastructure Hydrogen and Renewable Energies project (ITHER)\*
- Facilities: **Unique in Spain to work with large scale hydrogen equipment/systems** (8.5 m in height, safety measures (ATEX, gas detection equipment and ventilation)
- Infraestructure: **TEST BENCH at the services of companies** for developing new projects and technologies.



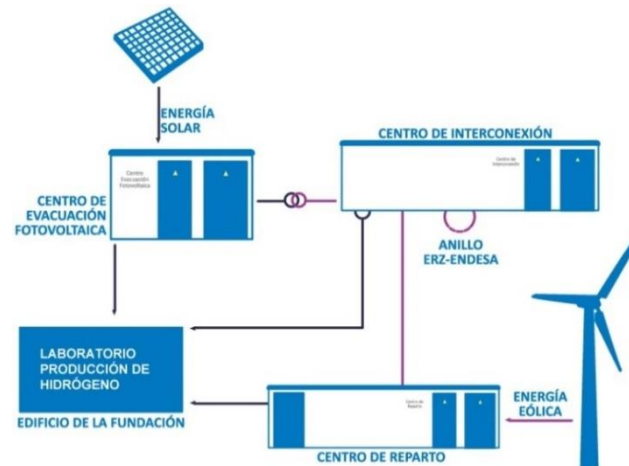
*\* Awards: International Energy Agency (IEA) (2010) and Spanish National Engineering (2007)*



- A 1200 m<sup>2</sup> building:
  - Offices
  - Laboratories
  - Workshop (For Hydrogen Industrial and Research Activities)



# Facilities and Infrastructures



- **Hydrogen as the energy vector**
- Production, storage and transport, applications
- Sustainable mobility and renewable energy storage
- Systems integration and energy efficiency
- Training



Fha as the key instrument for the **promotion of strategic projects** around the hydrogen, renewable energy, electric vehicles and energy efficiency.



# COMPETENCES

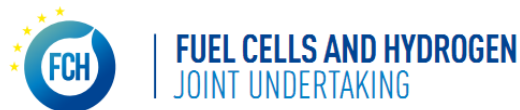
1. Private R&D&i Partnerships
2. Public R&D&i Partnerships
3. Public-Private R&D&i Partnerships
4. Collaboration Agreements
5. Training
6. Technology Transfer Agreements



Departamento de Innovación,  
Investigación y Universidad

**Grupo Investigación reconocido  
H2+I: Hidrógeno para la Investigación**

**PLAN ESTATAL DE INVESTIGACIÓN  
CIENTÍFICA Y TÉCNICA Y  
DE INNOVACIÓN 2013-2016**



Education and Culture

**Leonardo da Vinci**





- **H2PiyR (POCTEFA – INTERREG):** The main objective of the project is to develop a cross-Pyrenees border corridor of refuelling stations for hydrogen vehicles connecting Spain, France and Andorra with central and northern Europe, where the deployment of infrastructure associated with this type of mobility without emissions is more advanced.. Coordination: FHa. <http://h2piyr.eu/>



- **HyTechCycling (FCH JU):** The main goal of proposal is to deliver reference documentation and studies about existing and new recycling and dismantling technologies and strategies applied to Fuel Cells and Hydrogen (FCH) technologies, paving the way for future demonstration actions and advances in legislation. Coordination: FHa. [www.hytechcycling.eu/](http://www.hytechcycling.eu/)



- **ELY4OFF (FCH JU):** Hydrogen production by PEM water electrolyzers (PEMWE) has the potential of becoming a key enabling technology in the deployment of FCH technologies in the future energy market as an energy storage system able to deliver hydrogen to different applications and enabling a high penetration of renewable energy sources (RES). Coordination: FHa. [www.ely4off.eu/](http://www.ely4off.eu/)



**BIG HIT (FCH JU):** BIG HIT will create a replicable hydrogen territory in Orkney (Scotland) by implementing a fully integrated model of hydrogen production, storage, transportation and utilisation for heat, power and mobility. Coordination: FHa. [www.bighit.eu](http://www.bighit.eu)



- **ELYNTEGRATION (FCH JU):** The strategic goal of the ELYntegration Project is the design and engineering of a robust, flexible, efficient and cost-competitive single stack MW High Pressure Alkaline Water Electrolysis of 4,5Ton H<sub>2</sub>/day capable to provide cutting-edge operational capabilities under highly dynamic power supplies expected in the frame of generation/ transmission/ distribution scenarios integrating high renewable energies (RE) shares. Coordination: FHa. [www.elyntegration.eu](http://www.elyntegration.eu)



- **SUSTAIN HUTS (LIFE+):** The project aims to reduce CO<sub>2</sub> emissions emanating from buildings in isolated environments, such as mountain huts. The project also aims to prevent air pollution, preserve mountainous forests, promote sustainable tourism and introduce environmentally-friendly methods for the production, distribution and use of energy. Coordination: FHa. <http://sustainhuts.eu/es/>