



# Supporting the Regions to integrate Hydrogen **SPANISH REGIONS**

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Technology Platform on H<sub>2</sub> and FC



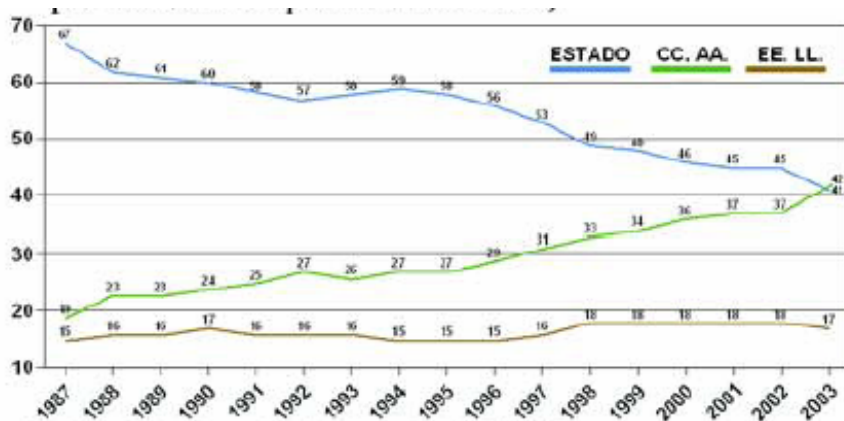
Generalitat  
Valenciana



# Status of Regional Administration in Spain

Spain is one of the most decentralized countries in the world

- 17 Autonomous or "Foral" Communities
- Mainly historic communities, very diverse
- More **budget** on Regions than on the State
- One financial regime, except for Navarra and Euskadi



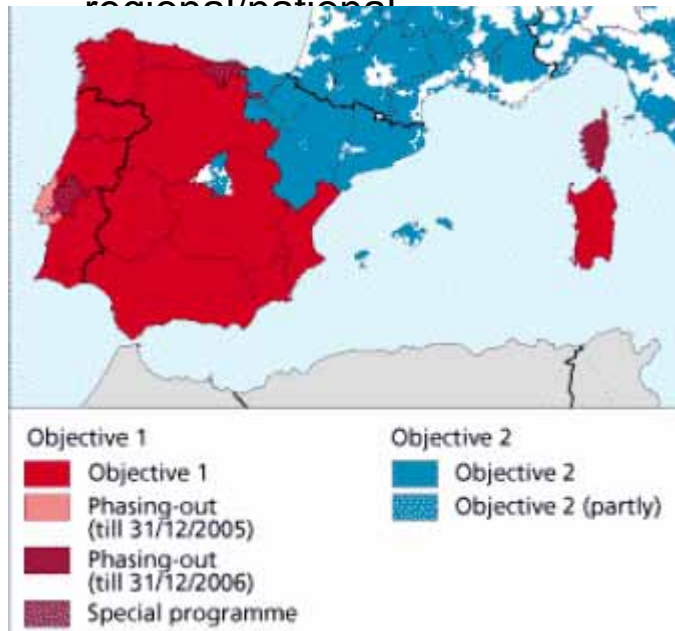
Fuente: Informe Económico-Financiero de las Administraciones Territoriales 2003. MAP

- Only 5 exclusive “competences” of the State
- Most of the “**competences**” are **shared**: education, research, environment, industry, energy, taxes...

# Common issues and differences

## Common

- Same level of “competences”
- Interest on **Renewable Energy**: National and Regional Plans for Renewable Energy
- **Spanish HFC Technology Platform**: Working Group to coordinate regional/national



Installed wind power on 31<sup>st</sup> Dec 2004



● Potencia fotovoltaica de 100kW  
Fuente: CNE

100 kW PV facilities on 31<sup>st</sup> Dec 2004

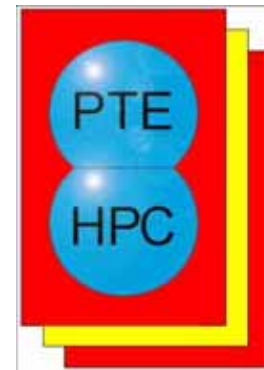
## Differences

- Diverse industrial and economic background
- Different approaches to Renewable Energy
- Very marked difference in accession to Structural Funds from the EU
- Many organisational models to support R&D

# Co-ordination on H2 and FCs in Spain

## Spanish Hydrogen Technology Platform

- Initiated by Spanish companies active in H2 and FCs
- Supported by the Spanish Government
- Large membership including
  - Companies
  - Research and Technology Centres
  - Universities
  - Networks
  - National and Regional Administrations
  - Users
- Provides an efficient mechanism to
  - Disseminate information to all stakeholders
  - Collect information on capabilities and needs
  - Gather input to build-up Spanish positions
  - Co-ordinate actions
  - Contribution to Spanish research and Technology Policy on these issues



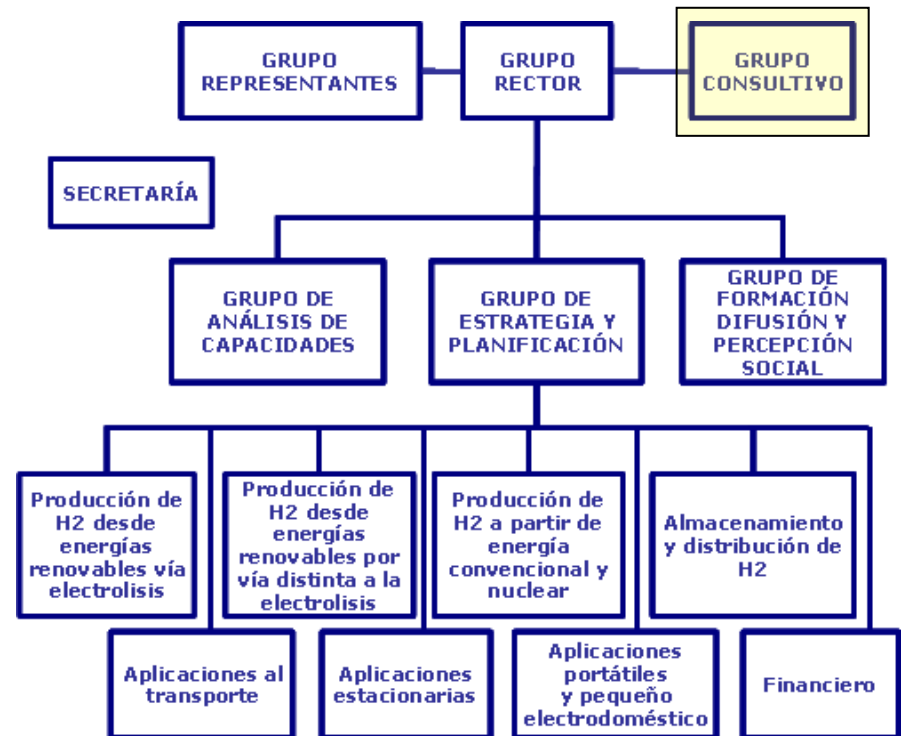
# Regional co-ordination in Spain

## Consultation Group of the Spanish HTP

- The Spanish HTP has a flexible structure that reflects the variety of actors and interests represented.
- In this respect, Autonomous Regions are represented in the Consultation Group of the Spanish HTP
- This presentation is the result of the consensus reached in that Group

## Autonomy and Co-operation

- This set-up is proving very flexible and efficient, as it allows regions to carry out their own initiatives with full knowledge of National and other Regions' activities



# Regional activities in Spain 1

## Overview of Regional Initiatives in Spain

- **Andalucía**

- Regional Research and Demonstration Plan
- Technology Corporation of Andalucía: a PPP, like **regional-scale JTI !!!**
- Hercules project: H2 from solar, storage, distribution (Hynergreen, Santana, Solucar...)



- **Aragón**

- Foundation for Hydrogen in Aragon: a PPP comprising 39 stakeholders covering all the value chain. **Dedicated to H2&FCs**
- Ither project (wind-to-H2) and SMEs focused projects (2.5 M€ in 2006)
- Regional Research Plan



- **Castilla-La Mancha**

- Cornerstones: **ELCOGAS IGCC plant and AJUSA** (PEMFC manufacturer)
- Regional Research Plan (R&D&D)



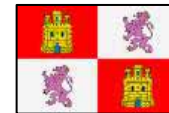
# Regional activities in Spain 2

## Overview of Regional Initiatives in Spain



- **Basque Country**

- Research/Industry alliances: IKERLAN/Mondragón (SOFC) and CIDETEC/Cegasa (PEM)
- Technology Research Centres: INASMET-TECNALIA (SOFC)



- **Castilla-León**

- Research Centres: CIDAUT and CARTIF
- Manufacturers: David FC
- Hychain project deployed in Soria, Valladolid and León municipalities



- **Comunidad Valenciana**

- Launching of the Valencian Initiative for Hydrogen (Regional PPP)
- Funding of Technology Institutes dealing with RES and H2 (2.4 M€ in 2006)
- Energy Infrastructures Plan and Starter Plan for RES target H2, as well as bus fleet in Valencia
- Industry-led projects: Demos by NTDA and fuel cell locomotive by Vossloh

# Regional activities in Spain 3

## Overview of Regional Initiatives in Spain

### Galicia

- wind-to-hydrogen projects



### Other regions or municipalities with on-going or reported projects (not exhaustive)

- Canary Islands: RES2H2 project
- Navarra: research in wind-to-hydrogen
- Madrid and Barcelona: CUTE project.
- Many researchers engaged in H2&FCs projects in these and other regions

# Initiatives/Drivers/Actors

## 1a. Main actors in hydrogen and fuel cell activities

**Regional governments** are the stakeholders promoting the development of a hydrogen-linked academic, technological and industrial infrastructure in their respective territories through PPPs. There is a tendency to establish specific support structures:

- e.g. The Aragón's Foundation for the development of new Hydrogen technologies.

**Research Centres** and Universities .Further to National Research Institutions (CSIC, CIEMAT, INTA) , most regions have active centres in technology areas like fuel cells design and wind-to-H2 applications

- e.g. TECNALIA and IK4 (Basque Country)

**Industries**, both big companies and SMEs, are active in developing applications for mature sectors, namely energy, automotive, railways.

- e.g Cegasa, Naturgas and Gamesa Eólica (Basque Country)
- Nortérmica and Carrocera Castrosua (Galicia)
- Carbueros Metálicos and Air Liquide in several Regions
- Vossloh (Valencia)

**Specific H2/FC** companies are still rare, yet very active: Hynergreen (Andalucía), NTDA (Valencia), David FC Components (Castilla León), AJUSA (Castilla-La Mancha)

# Initiatives/Drivers/Actors

## 1.b Advantages anticipated from hydrogen and fuel cell deployment

### Business development

- New business opportunities are a major driver both for regional governments and companies. Hydrogen is expected to raise favourable conditions for creating and exploiting new markets.
- Catalytic effect on the development of renewable technologies

### Environmental preservation

- An evident expected benefit is the reduction of greenhouse gas emissions and its negative impact on the environment, namely the global warming

### Opportunities for regional promotion

- Development of meaningful lighthouse demonstration projects and infrastructure deployment will have a powerful image projection of modernity and innovation that will attract investors, students, scientists and visitors.

### Establishment of strategic alliances

- RTD projects will facilitate early alliances with far-reaching strategic importance for the future development of the hydrogen-related market

# Initiatives/Drivers/Actors

## 2. “Willingness to pay” for the perceived advantages

### There is willingness to invest

- All agree that there is will and money to pay for these advantages, but there are also uncertainties on how, where and when to place these investments.

### Uncertainties delay decision-making

- Investments also need to be co-ordinated from public and private sources. The PPPs should help to find the best way to do it, but still require some time to get constituted, established and to be operational.
- These are all uncertainties linked to a new market, where **early movers** have high expectations to get dominant positions, but also risk **early failure** that can put them out of business.

# Funding and support

## 1. Availability of regional funds for these activities, both H2FC-specific and general energy-environment activities.

### No Regions with H2FC-specific programmes as yet

- Regional RTD plans have not yet developed specific programmes for H2FC projects.
- All regions have generic Renewable Energy Programmes, both for RTD projects and infrastructure development, from which budgets H2FC-related projects are funded.
- Despite this lack of specific programmes, investments in H2FC-related projects are steadily growing annually, reaching up to 2.5 million per year (Basque Country) for these activities.

### Need for sensible projects

- The limiting factor is more the **lack of well-defined** projects than the shortage of RTD budgets. The 7<sup>o</sup> FP (JTI, other instruments) could drive this process.

# Funding and support

## 2. Regional policies and other instruments in support of H2FC R&D, demonstration and deployment (benefits, shortcomings).

- Fostering of Regional PPPs (e.g. Valencian Region)
- Design of specific RTD and deployment programmes at regional level
- Creation of specific institutions and undertakings (Aragón)
- Participation in European projects (Castilla León, Basque Country, Valencia, Madrid, Catalonia)

## 3. Interactions (overlap, shortcomings) with other regulatory frameworks

- There can be difficulties with the State Aid restrictions to companies, as this is an area that particularly needs the public support to start up operations of new firms, mostly SMEs.

# Problems/ Obstacles/ Barriers/ Difficulties

## 1. Main obstacles experienced by regions in H2FC deployment

- High investments required with too long-term perspective of benefits
- Lack of clear perspectives of well defined applications in new products
- Need to diversify the local industrial to use and exploit the technology
- Insufficient or absent Regional RTD prioritisation in H and FC
- Insufficient availability of equipment for demos (vehicles, fuel cells, H2 stations)
- Insufficient public awareness and interest
- Perception that it is too late to compete in developing technology already in place. Regions can only be 'customers' and not 'drivers'

# Problems/ Obstacles/ Barriers/ Difficulties

## 2. Role for EU in overcoming these obstacles

- Providing a common and clear strategy for RTD and deployment identifying areas where European companies could be competitive
- Clearly specify percentages of FP7 budget and type of actions to be channeled through the JTI
- Facilitating access to knowledge and technology through aggressive training and exchange programmes.
- Raising public awareness
- Helping to incorporate collective core knowledge and technology everywhere in Europe. **It will be a mistake to concentrate the know-how in a few regions in Europe.**
- **Favouring spread of technological capacity all across Europe**
- Promoting (awareness) specialised seed and venture funds for H2 through EIF
- Developing specific loans for H2-related large projects by the EIB

# Acceptance and participation

## 1. Public involvement in hydrogen projects

- Beyond bus fleet deployment in cities, there are still no major demo projects with public visibility. Projects have been targeted to specific industry sectors.

## 2. Participation and acceptance in the projects developed by the region

- Media get gradually more interested on any news dealing with H<sub>2</sub> and look backwards to experiences with hydrogen buses and vehicles

## 3. When is public informed of the project?

- At deployment time.

# Finance Needs

## 1. How is the invested capital supplemented

- Subventions, grants and loans from European, National, Local and Regional programmes
- At a smaller extent, private capital through RTD personnel effort, equipment and infrastructure.

## 2. Are there specific instruments in your region

- GESTA programme and Starter plan for the Energy Sector (Valencia) aids the creation of new companies addressing specific technology problems and supports development of the emerging industry
- Specific programmes of municipalities for Hydrogen fleets
- Collaborative research grants are available in all regions

# Finance Needs

## 3. How much % should come from the European Union

The highest possible percentage, namely at the earliest stages of deployment of the Hy....

## 4. Are you aware of alternative financial instruments

EIB and EIF instruments need to be further explored  
Structural Funds

## 5. What are your exact needs for financing mechanisms

- Long-term loans and non-refundable subventions
- More intense specific seed and venture capital funds for H2-related projects
- EIB funds for large infrastructure and demonstration projects
- Fiscal incentives for H2-related projects

# Cooperation

1. How does the cooperation of the different actors involved into the hydrogen issue work in your region?

2. How did you as a region engage the different actors?

- Through **co-ordination structures**
  - PPPs (Andalucía)
  - *Ad-hoc* institutions (Aragón)
- Through **specific projects**
  - Industrial projects
    - Heating pumps, Electric Hybrid traction vehicles (Galicia)
    - Mondragón/Cegasa/CIDETEC/Ikerlán cooperation for developing FC technology in the Basque Country
  - RTD projects (European, National, Regional, Local)
    - SOFCSpray (Valencia, Basque Country)
  - Demonstrations
    - CUTE project
    - HYCHAIN (Castilla-León)
    - Tecnalía/INASMET/Robotiker (Basque Country)

# Cooperation

## 1. Is there a “regional champion” ... or is there rather some sort of cooperation between different smaller actors?

- In most cases, emerging ‘bottom-up’ cooperation scales up or prepares the pave to the creation of a leading structure. It could be expected that in the mid-term ‘leading structures’ will be established in most regions.
- Some regions do have emblematic companies, research centres or institutions that lead the process in their territories and/ or give high visibility.
  - H2 Foundation Aragón
  - NTDA Valencia
  - Hynergreen Andalucia

## 2. Do you have cooperation activities with other regions?

- Mainly through European RTD projects
  - Roads2Hycom
  - HyCo
  - HyWays

# Other support

- 1. Would you think that more and better information about hydrogen should be supplied? If so, which contents and which forms would suit your needs?**
  - A high quality data base on the main EU actors on hydrogen and fuel cells should be developed and widely distributed. It should include: Industries with significant expertise in product development, demonstration and commercialisation; relevant R&D centers; significant R&DD Projects within the different Member States; local ventures
- 2. What other support (incl. incentives, regulatory change) would you like to receive from your National government and from the EU?**
  - A Spanish H2 and fuel cell R&DD Programme should urgently be launched with a few (2 or 3) clear technological objectives, with industrial leadership.
  - Similarly, a specific programme (fixed budget) on H2 and FC should be included in FP 7
  - Incentives linked to the use of Renewable energy, increase of efficiency and emissions reduction

# Conclusions

1. **Spanish Regions are committed and already embarked in the deployment of the Hydrogen Technology and Economy**
2. **There is a substantial amount of funding available at regional level**
3. **At the same time, there is a need to better define the framework in which major RTD and D projects will be conceived and developed**
4. **Despite the fact that Regions constitute the major playground of the deployment strategy and demonstration, Regions have very little –if any, role in the Governance of FP7 and JTI**
5. **We encourage the EC to**
  - **define rapidly which criteria will govern the split of execution of FP7 between JTI and other instrument**
  - **Establish an indicative amount of resources for H2 and FC RTD&D**
  - **Incorporate the Regions' views into the governance of the actions in support of H2 and FC under FP7**



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