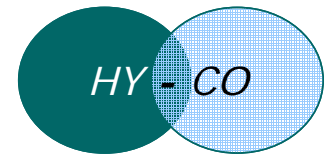


Hydrogen and Fuel Cells in Portugal

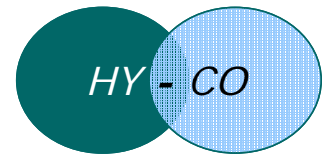
Rei Fernandes

H₂ Policy in Portugal



- Portugal had no special Policy Document on H₂.
- Great interest & proactive in participation in H₂ related projects.
- participated in EU H₂ projects for at least 10 years
- The Ministry for Science, Innovation and Higher Education is at present preparing a National Programme on H₂ (taking into account the contributions of Universities, Research Centers and Industry)

New & Renewable Energy Technologies for Sustainable Development



Workshop *“Hydrogen and Fuel Cells in Portugal”*

Évora, 30 June 2004

**SUPPORT FOR₂-ACTIVITIES
IN PORTUGAL**

**NATIONAL AND EU
PROGRAMMES**

Eng.^aVirgíniaCorrêa

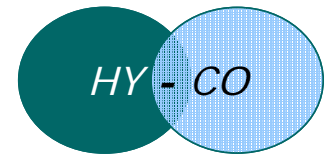
Director, GRICES

RENEWABLES 2004
ÉVORA, June 30

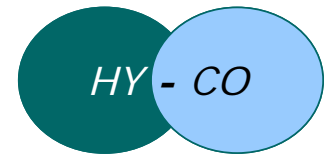
Panelists & Topics

- **Eng^a Virgínia Corrêa (GRICES)**
Initiatives and support available from Government
- **Prof. João Crespo (FCT)**
Impact of the ERA-NET on the Design of National Research Programmes.
- **Eng. Campos Rodrigues (SRE)**
Status of industry/Real problems/ Stationary and Portable perspective
- **Prof. Tiago Farias, AP2H2**
Status of industry/real problems
- **Prof. José Quadrado APVE**
Transport perspective- interest group (APVE & DGTT)

H₂ Policy in Portugal



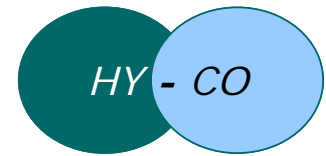
- **H₂ is regarded as an area of high interest in the medium term**
- **A High-level group has been appointed by the Minister of Science, coordinated by GRICES**
- **It Involves Representatives of The Ministry of Science, Industry and The Research Community**
- **It shall propose measures for a H₂ policy in Portugal**



International Context

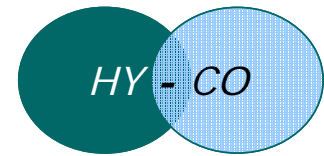
- **EC Technology Platform & MS Mirror Group**
- **Participation in Steering Committees & Initiative Groups**
- **Coordination with the *International Partnership for the Hydrogen Economy (IPHE)***
- **Promote National Groups of Excellence for International Cooperation**

Support For H₂ Projects

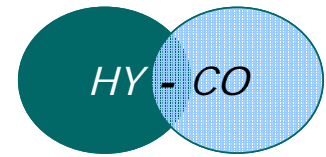


- Ministry of Science Innovation & Higher Education: **R&D FUNDS** (FCT calls for proposals, open to all areas on a competitive basis)
- Ministry of the Economy: **Funds for innovation and industrial initiatives (PRIME)**
- Aid for Preparation of **NEW EC R&D PROJECTS**

Summary of Portugals Views

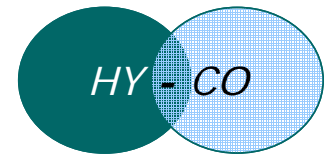


- **The Ministry of Science Innovation and Higher Education & GRICES are Deeply Comitted to an Effective H₂ Strategy for Portugal.**
- **“GRICES Shall Try Our Best to Stimulate the Participation of National Teams In International R&D Consortia for EU FP6 Projects.” (Director – GRICES)**
- **There are many opportunities, but many challenges too, as this is an emerging R&D topic.**
- **New R&D teams active in this area are most welcome.**



Portugal's participation in H₂ & FC Projects

H₂ & FC related projects in Portugal



Present participation in:

■ RD&D Projects

■ Policy Projects:

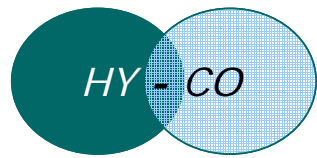
✦ HySociety

✦ HyNet

✦ HyWays

✦ HyCo

Riding a Fuel Cell Bus



RD&D :
CUTE

Demonstration of 3
FC buses in Porto



INFORMAÇÃO

LINHAS 1E 18
NOVO HORÁRIO

Os eléctricos das linhas 1E e 18 terão um novo horário desde 1 de Dezembro, para que gerem água até mais tarde.

| Tarifa | Horário | Preço |
|--------|---------------|---------|
| Normal | 08:00 - 18:00 | € 2,00 |
| Normal | 18:00 - 20:00 | € 3,00 |
| Normal | 20:00 - 22:00 | € 4,00 |
| Normal | 22:00 - 24:00 | € 5,00 |
| Normal | 24:00 - 01:00 | € 6,00 |
| Normal | 01:00 - 05:00 | € 7,00 |
| Normal | 05:00 - 08:00 | € 8,00 |
| Normal | 08:00 - 18:00 | € 9,00 |
| Normal | 18:00 - 20:00 | € 10,00 |
| Normal | 20:00 - 22:00 | € 11,00 |
| Normal | 22:00 - 24:00 | € 12,00 |
| Normal | 24:00 - 01:00 | € 13,00 |
| Normal | 01:00 - 05:00 | € 14,00 |
| Normal | 05:00 - 08:00 | € 15,00 |
| Normal | 08:00 - 18:00 | € 16,00 |
| Normal | 18:00 - 20:00 | € 17,00 |
| Normal | 20:00 - 22:00 | € 18,00 |
| Normal | 22:00 - 24:00 | € 19,00 |
| Normal | 24:00 - 01:00 | € 20,00 |
| Normal | 01:00 - 05:00 | € 21,00 |
| Normal | 05:00 - 08:00 | € 22,00 |
| Normal | 08:00 - 18:00 | € 23,00 |
| Normal | 18:00 - 20:00 | € 24,00 |
| Normal | 20:00 - 22:00 | € 25,00 |
| Normal | 22:00 - 24:00 | € 26,00 |
| Normal | 24:00 - 01:00 | € 27,00 |
| Normal | 01:00 - 05:00 | € 28,00 |
| Normal | 05:00 - 08:00 | € 29,00 |
| Normal | 08:00 - 18:00 | € 30,00 |
| Normal | 18:00 - 20:00 | € 31,00 |
| Normal | 20:00 - 22:00 | € 32,00 |
| Normal | 22:00 - 24:00 | € 33,00 |
| Normal | 24:00 - 01:00 | € 34,00 |
| Normal | 01:00 - 05:00 | € 35,00 |
| Normal | 05:00 - 08:00 | € 36,00 |
| Normal | 08:00 - 18:00 | € 37,00 |
| Normal | 18:00 - 20:00 | € 38,00 |
| Normal | 20:00 - 22:00 | € 39,00 |
| Normal | 22:00 - 24:00 | € 40,00 |
| Normal | 24:00 - 01:00 | € 41,00 |
| Normal | 01:00 - 05:00 | € 42,00 |
| Normal | 05:00 - 08:00 | € 43,00 |
| Normal | 08:00 - 18:00 | € 44,00 |
| Normal | 18:00 - 20:00 | € 45,00 |
| Normal | 20:00 - 22:00 | € 46,00 |
| Normal | 22:00 - 24:00 | € 47,00 |
| Normal | 24:00 - 01:00 | € 48,00 |
| Normal | 01:00 - 05:00 | € 49,00 |
| Normal | 05:00 - 08:00 | € 50,00 |

H₂ BUS

Com o H₂ a poluição evapora-se.

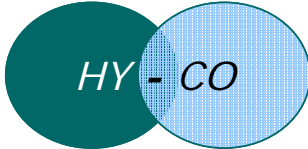
INFORMAÇÃO

LINHAS 1E e 18 ELÉCTRICAS
Corte temporário de serviço de 10 de Janeiro

Devido ao corte temporário de serviço das linhas 1E e 18, o serviço normal de eléctricos será suspenso entre as 18 e as 19 horas.

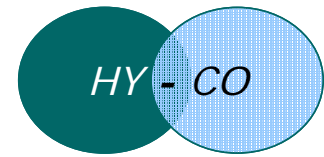
A STCP convida a população a participar neste desafio, sendo-lhe agradada a vossa colaboração (sempre que possível).

Driving a Fuel Cell Car



HY-CO Kickoff Meeting 16-17 December 2004 Lisbon Portugal

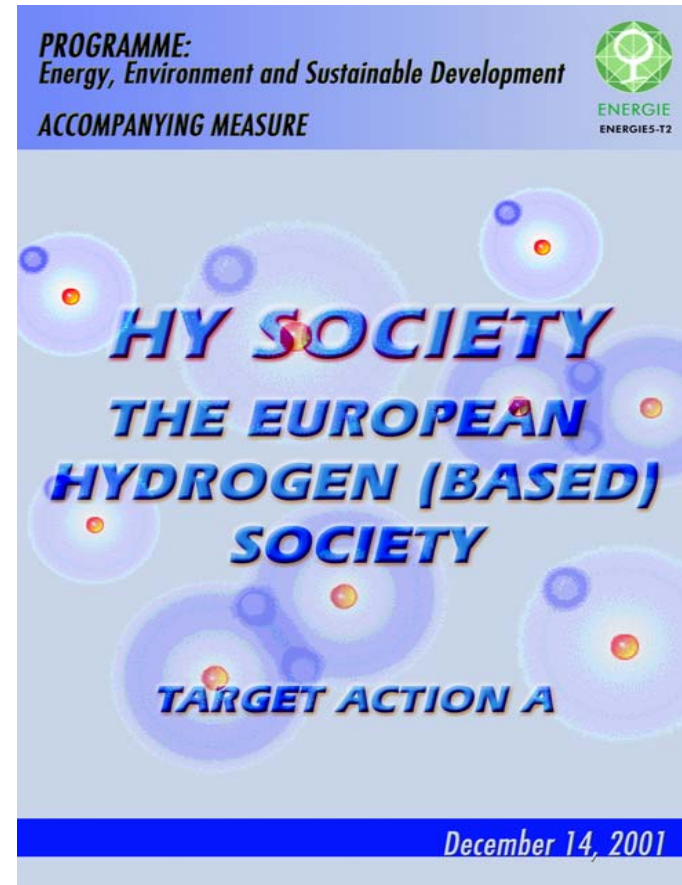
FC related projects in Portugal



- “Novel compact steam reformer fuel cells, with heat generation by catalytic combustion augmented by induction heating”.
- “MERCATOX – Development and evaluation of an integrated methanol reformer and catalytic gas clean-up system for a SPFC vehicle”.
- “VFCPP – Virtual fuel cell power plant”.

Developing a complete action plan for the introduction of hydrogen in the European society.

- 20 institutions involved
- Coordination: IST
- 2002-2005

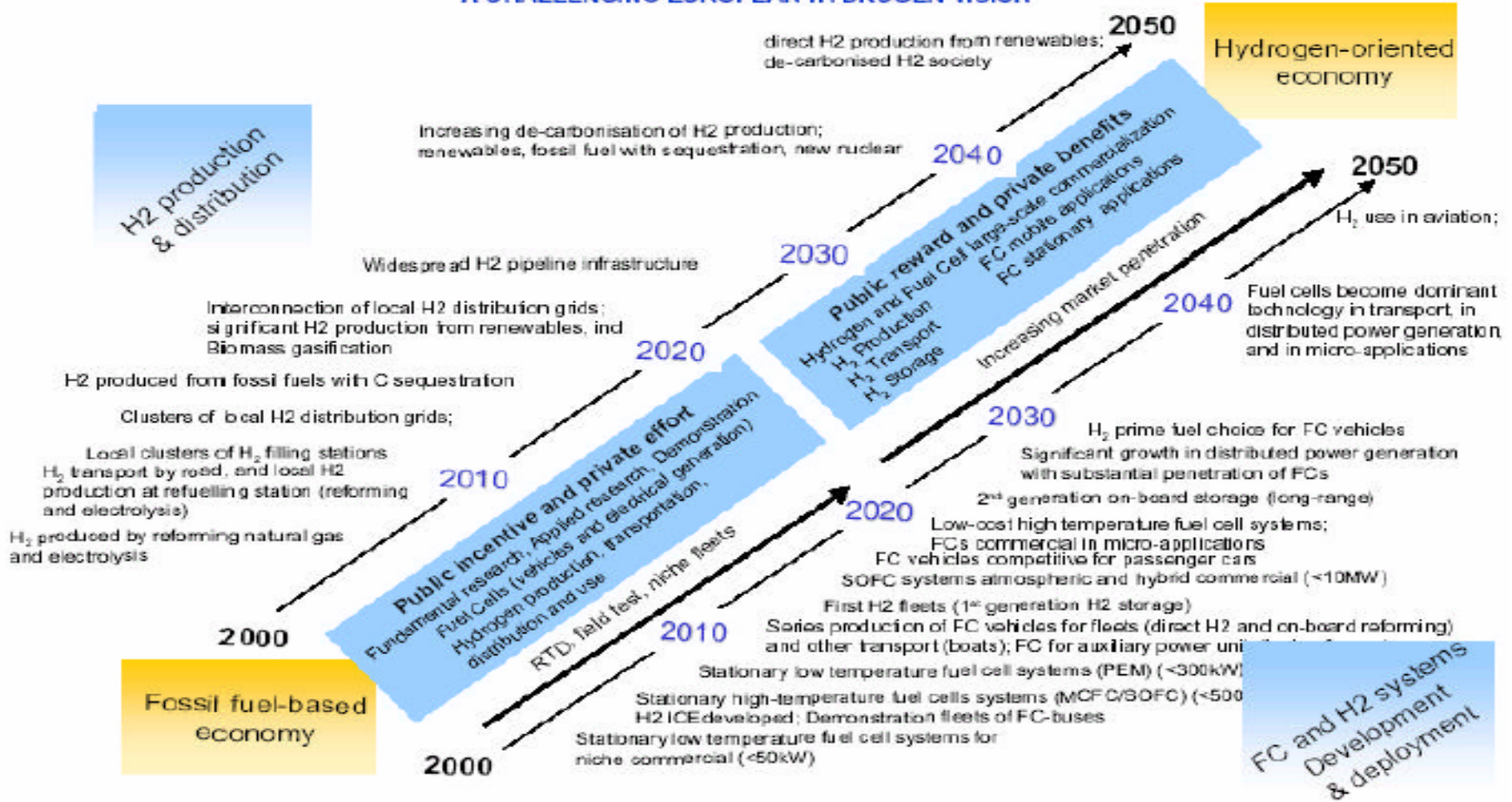


Anticipated Outcomes

- Social Impacts of H₂
- Political & fiscal support measures
- Environmental impacts of the H₂ society
- Proposed set of codes and measures

HyNet

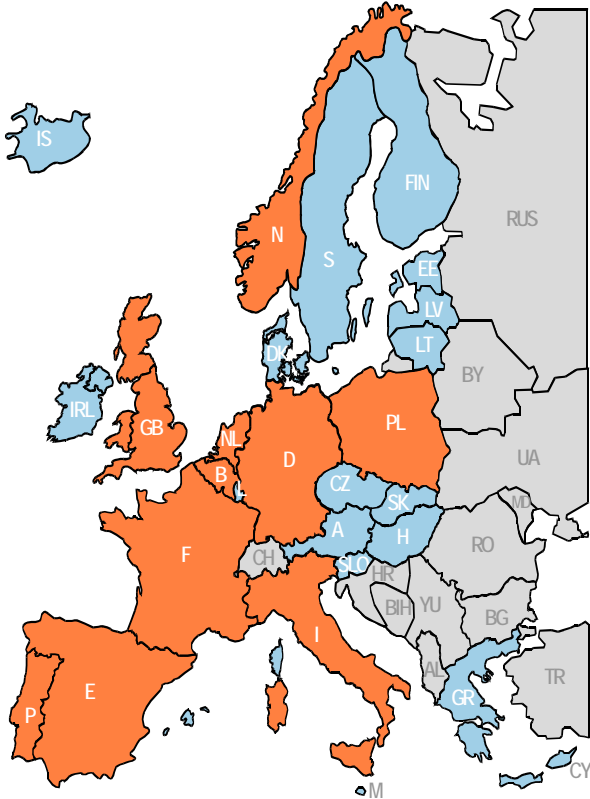
A CHALLENGING EUROPEAN HYDROGEN VISION



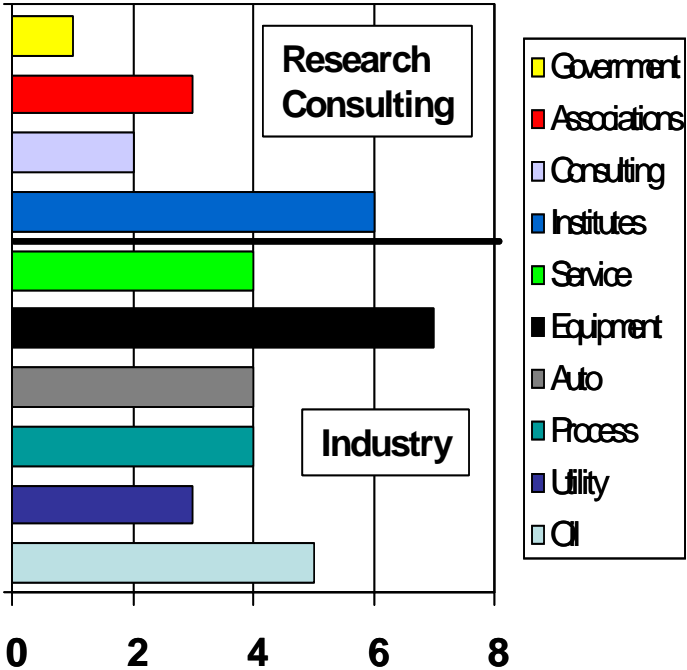
First-stage European Hydrogen Roadmap

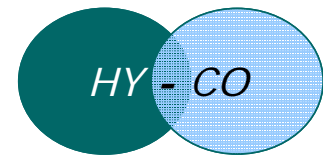
HyNet Roadmap

By region/member state



By sector

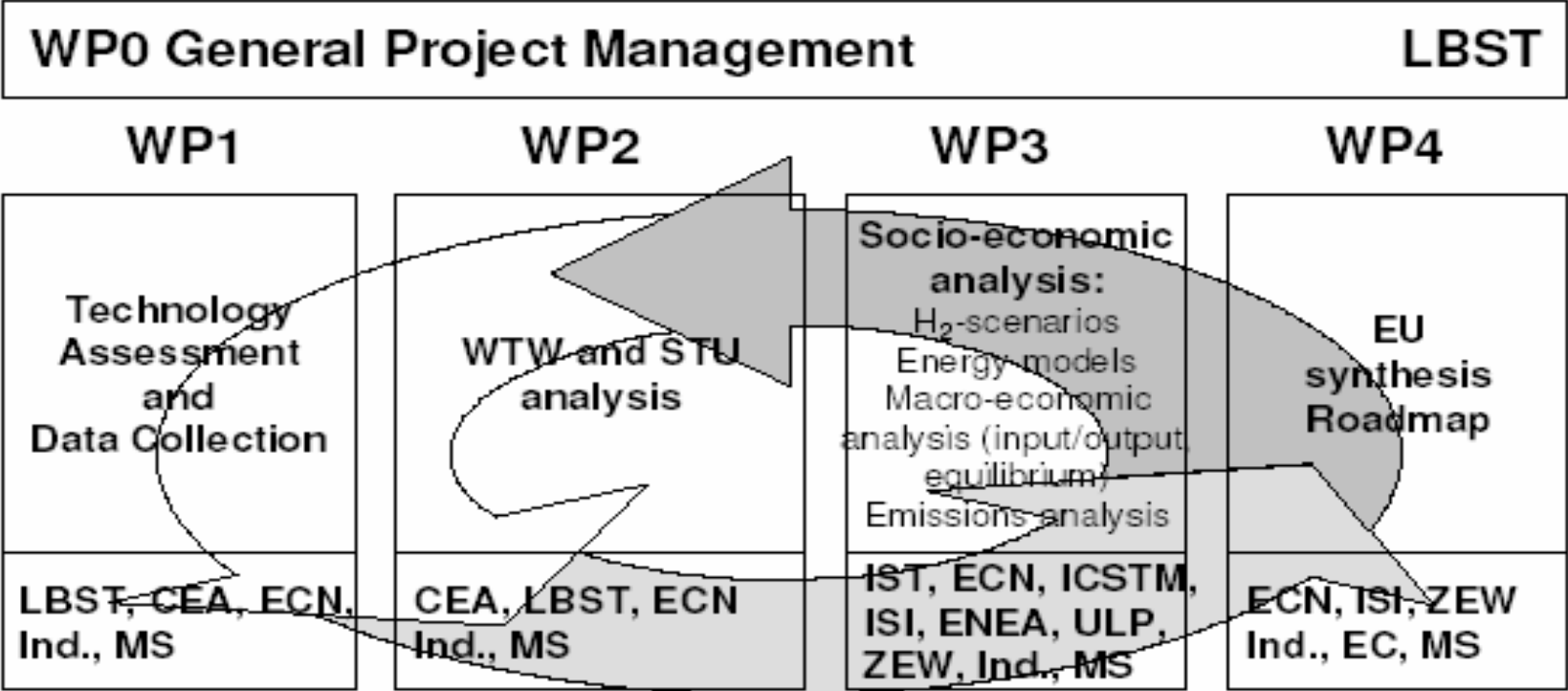




HyWays

- Building on HyNet to develop first detailed roadmap for the EU
- Original “hybrid” approach (energy system modelling + qualitative policy review)
- Concentrates on 6 MS in Phase I – “toolbox”
- Portugal likely to be analysed in Phase II (2005-2007)
- IST/IDMEC: Coordinates socio-economic analysis
- Benefits: building our expertise and leaving our mark in future legislation

HyWays



Ind. - Industry (20 auto, energy/oil and process companies)
 MS - regional or member state experts

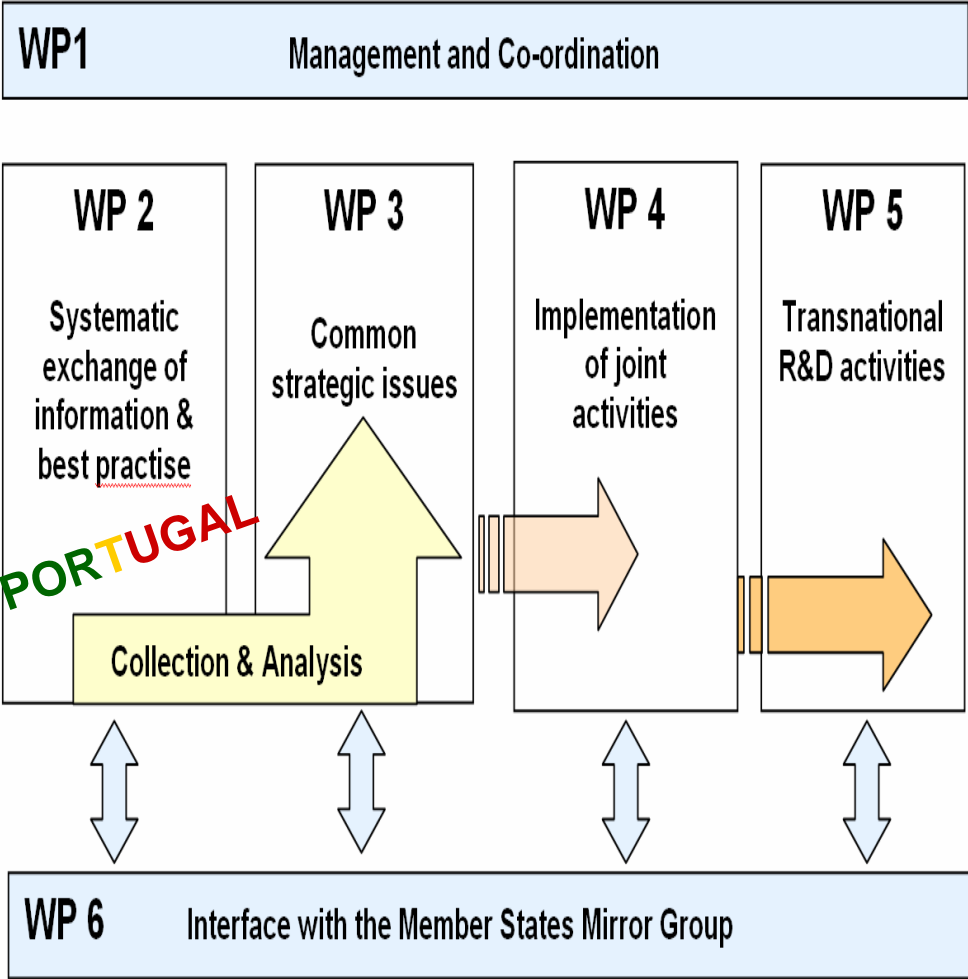
PORTUGAL

HY-CO

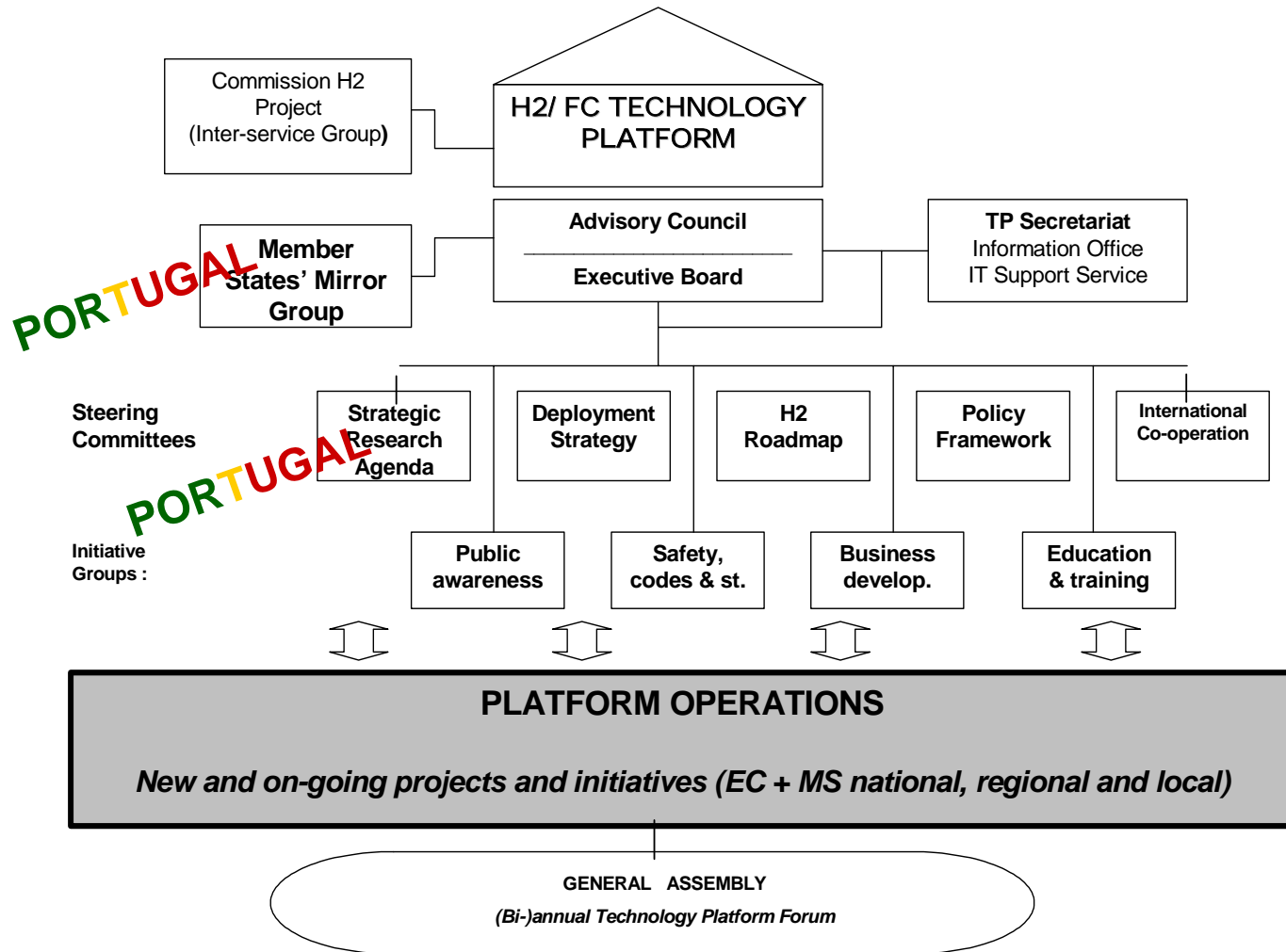
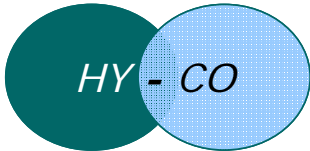
- Common European platform for

- ✦ information & coordination of hydrogen and fuel cells research, including joint activities
- ✦ coherent policies towards a hydrogen economy

- Set up an interface with the Member States Mirror Group



Hydrogen & Fuel Cell Technology Platform



Support for SMEs



sre

soluções racionais de energia

“Rational Energy Solutions”

- Founded in January 2002, in Lisbon
- In this early stage, exclusively concerned with the development, manufacture and commercialization of Fuel Cell based energy production systems
 - ✦ 10-15W for telemetric application
 - ✦ 100-20 W power sources for emergency and backup
 - ✦ 1kW power sources for mobile systems