

IPHE COUNTRY UPDATE ITALY

Steering Committee

Sao Paulo April 24-26, 2007

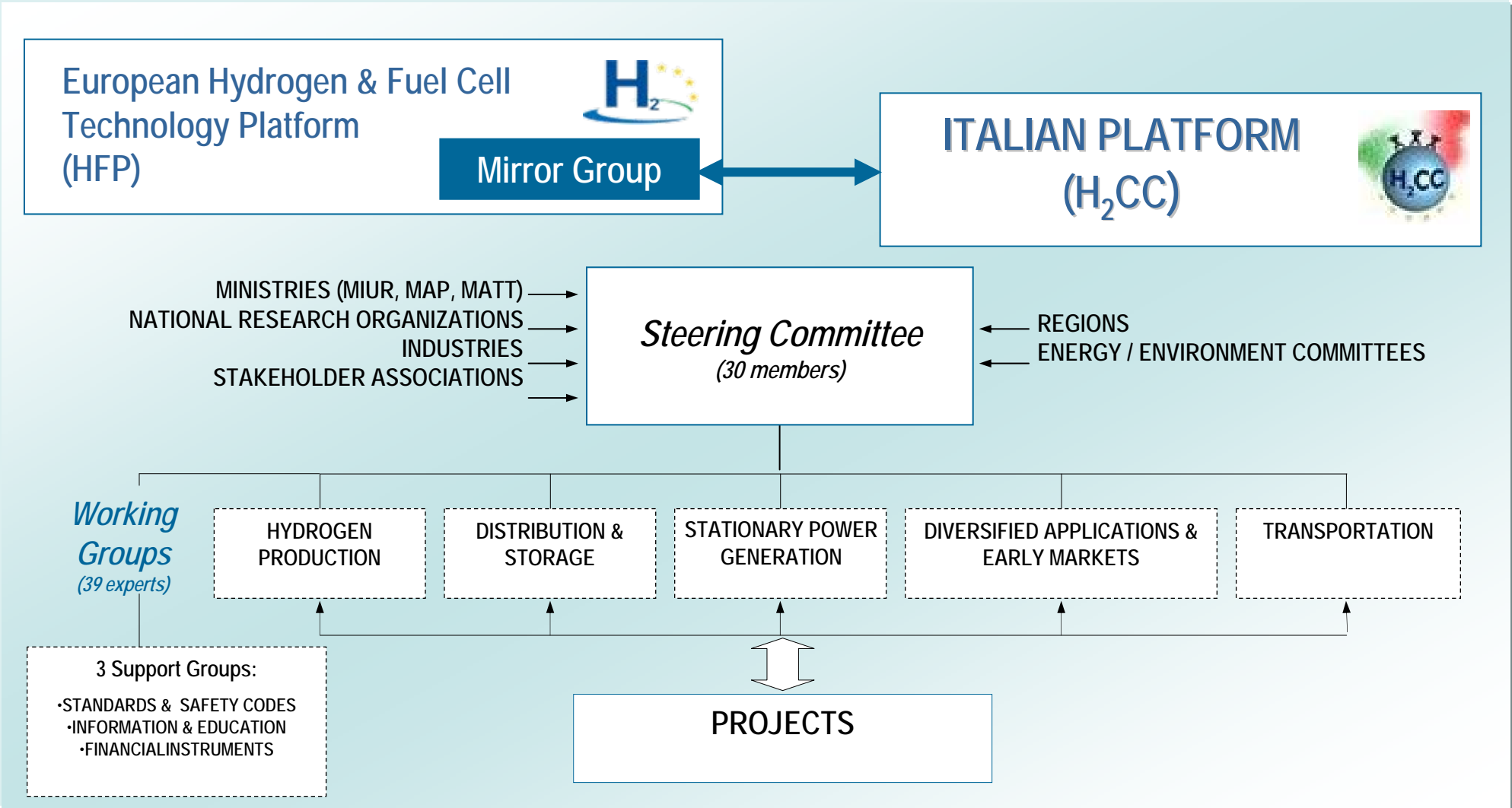
AGENDA

- **New Policy Initiatives**
- **Demonstration Projects update**
- **Events and Solicitations**
- **Government Hydrogen and FC R&D&D Funding**

NEW POLICY INITIATIVES

- **National Platform on H2 & FC**
- **Regional H2 Parks**
- **R&D National Program on H2 & FC**
- **The Italian Hydrogen and FC Association (H2IT)**

H2CC Platform Structure



Research priorities

- **Technologies for cost-effective hydrogen production from renewable sources (20% of the total production in 2030)**
- **High efficient technologies for hydrogen production from fossil fuels with possible CO₂ separation and sequestration**
- **Hydrogen distribution via pipelines (some tens km in 2015, regional networks within 2030)**
- **PEFC systems for propulsion of vehicles suitable for series production (cost of < 200 €/kW in 2015, 30% of the market in 2030)**
- **Efficient and safe hydrogen storage systems for transportation and stationary applications (0.1 kgH₂/L within 2015)**
- **Fuel cell (PEFC, MCFC) systems for distributed power generation and marine applications (lifetime over 40000 h, cost of 1500-2000 €/kW in 2015).**

National Platform on H2 & FC

- **Proposed budget for the 2008- 2016 period E million 645**
- **Negotiation in progress**

Regional H2 Parks

| <u>Region</u> | <u>project</u> | <u>E (million)</u> |
|---------------|--------------------|--------------------|
| • Piemonte | H2 Systems | 8.7 |
| • Abruzzo | H2 from renewables | 6.0 |
| • Campania | HT FC | 4.0 |
| • Lombardia | Zero Regio | 2.4 |
| • Sicily | H2 systems | 2.2 |
| • Veneto | Fossil H2 | 8.7 |

R&D National Program

Fuel Cells Projects – Three year budget

Emillion

- | | |
|-----------------------------------|-----|
| • FC polimeric and ceramic | 9.8 |
| • FC development and use | 7.6 |
| • Nanosystems for new FC concepts | 4.4 |
| • MCFC develop and 500 kw demo | 5.0 |
| • MCFC new production process | 7.6 |
| • New prothonic membranes | 4.3 |

Hydrogen Projects – Three year budget

E million

- H2 microcombustors 6.1
- Nanomaterials for production and storage 4.3
- H2 from renewables 6.9
- H2 production and use in distributed power gen 5.5
- Transition towards the H2 Economy 10.7
- H2 from light liquids 7.0
- Bio H2 5.5
- H2 from refinery and chemical plants 4.9

R&D National Program - Status as per today

- **The three year R&D National Program is now at half term.**
- **End of the project scheduled for the end of 2008**
- **Final technical reports expected by June 2009**

The Italian Hydrogen and Fuel Cell Association H2IT (1/2)

Established in 2004; to date over 110 members

Sustaining members: ENEL, ENI, Edison, Regione Lombardia, Regione Abruzzo, Pirelli, SAPIO, Gruppo Sol, the Linde Group, FAST, SAATI, Turbocare.

Principal activities:

1. International collaboration to exchange best practice:

Participation in seven EU projects (7), the EU H2 and FC Technology Platform and one of the 10 national associations of the European Hydrogen Association (EHA).

2. Education and Promotion:

- H₂IT Roadshow “Hydrogen hits the roads!” visiting Schools, Chambers of Commerce and Local Authorities;

- Management of coordination secretariat “HYFED6” in Brussels for educational activities in hydrogen and fuel cell field;

- Organisation of collective presence at main European industry events; World Hydrogen Energy Conference, European Hydrogen Energy Conference, Hannover, Fiera Milano Tech.

The Italian Hydrogen and Fuel Cell Association H2IT (2/2)

3. Facilitate development of local industry value chains for :

H2IT Taskforce “RE:H2”: facilitates zero emission hydrogen and fuel installations in education and nature centers in Italy (Abruzzo, Lombardy);

H2IT Taskforce “Stazionarie” : coordinates FC installations in challenging locations to develop local authorization expertise (historic city centers, Milan);

H2IT Taskforce “Automotive H2” developed complete scheme for adapting existing fuelling stations to hydrogen and hydrogen/methane mixture refuelling;

H2IT Taskforce “Financing and Cost analysis” facilitated the creation of the European H2 and FC Market Observatory, a network of 12 top Business Schools and Universities coordinated by Bocconi University;

H2IT Taskforce “Regulations, Codes and Standards”: promote adoption of local and national regulations.

Demonstration Projects Update

- **One FC bus on road**
- **One advanced technology FC bus in preparation at Fiat Research Center**
- **Several FC cars on road in different cities**
- **2 stationary 1 MW FC demo units planned at Enel Research Center based on MC Ansaldo technology and on SO technology (to be selected)**

Events and solicitation

- **World Hydrogen Technology Convention - Montecatini Terme (near Florence) Nov 4-7,2007: more than 500 participants expected from about 40 countries**
- **A presentation on IPHE activity has been already scheduled**
- **World Energy Congress - Rome Nov 11-15,2007: more than 5000 participants already accepted**
- **A presentation on IPHE activity planned with the organizing committee (discussion in progress)**

Government Funding US\$ (million)

H2 & FC National Program

| | | |
|---------|----|-----|
| • 2006 | 39 | |
| • 2007 | 40 | |
| • 2008 | 38 | |
| • Total | | 117 |

Regional H2 Parks (2007-2009) about 42