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European Commission Update 6th IPHE Steering Committee Meeting

Reykjavik, 25-27 September 2006





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New Policy Initiatives on Hydrogen and Fuel Cells

- × Green Paper: ***A European Strategy for Sustainable, Competitive and Secure Energy***; open for public consultation; sets out future energy policy priorities,
 - ✓ measures for energy markets;
 - ✓ common external energy policy;
 - ✓ recommendations for carrying out a Strategic European Energy Review;
 - ✓ Action Plan on Energy Efficiency;
 - ✓ Renewable Energy Roadmap;
 - ✓ Strategic Energy Technology Plan.

- × Draft proposal for **regulation for hydrogen powered vehicles**; harmonized testing requirements for type-approval; aims to ensure safe operation of hydrogen vehicles by incorporating them in the EU vehicle type-approval framework; establishing safety requirements for hydrogen storage systems.

http://www.ec.europa.eu/enterprise/automotive/index_en.htm





New Policy Initiatives on Hydrogen and Fuel Cells(cont'd)

- × 7th Framework Programme (2007-2013) / Joint Technology Initiative (JTI)
- × Publication : Hydrogen and Fuel Cell Technology Platform "**Interim Implementation Plan**", June 2006: open consultation; revision underway; sets out elements of RTD&D and supporting actions for implementation in FP7 and a possible Joint Technology Initiative:
https://www.hfpeurope.org/hfp/ip_consultation
- × Proposal for a **Directive on Clean Vehicles in Public Fleets**; Public bodies should allocate 25% of annual procurement of their fleet to *clean vehicles (>3.5 tons)* (eg buses, refuse trucks)-leasing and purchasing of vehicles included; *Clean Vehicle* defined in European Performance Standard (indicates pollutant emission limits).



Hydrogen and Fuel Cell R&D Update

Fuel Cells RTD:

- × Collaborative research on durable MEAs for high temperature operation (130 °C)
- × Harmonisation and standardisation of cell and stack testing procedures via FCTESTnet, FCTESqa

Hydrogen Production

- × Developing technologies to reduce cost of CO₂ capture to EU target of 20-30 €/tonne at 90% capture
- × On site H₂ production from gaseous and liquid feedstocks-development of a small-scale, fuel flexible H₂ generator



Hydrogen and Fuel Cell R&D Update

The European Solar Hydrogen cluster:

- × solar steam reforming- development of 400 KW reformer
- × development of solar reactors : prototype (50 KW) for co-production of H₂/C black from NG reforming
- × water splitting via redox-pair based thermo-chemical cycles (target: building 100 kWth solar reactor plant)
- × Exploring synergies between solar reactors and nuclear-based production with thermochemical cycles – basic research and concept definition

Advanced electrolysers

- × feasibility of SOEC electrolyser-
- × development of PEM electrolyser – GENHYPEM project – target 70% at 1 A/cm², 1 Nm³/h H₂, >50 bars, 50 000 hrs lifetime, 25,000 already achieved.



Hydrogen and Fuel Cell R&D Update

Hydrogen Safety and Regulations, Codes and Standards

- × Developing EU-harmonised set of codes for approval of H₂ based systems:
 - ✓ HyAPPROVAL approval handbook for *Refuelling Stations* ;
 - ✓ *Stationary systems*: HyPER (permitting guides for small stationary installations)

- × H₂ safety (HySAFE network): HIAD database definition; CFD Benchmarks Based on H₂, large scale (industry relevant) experiments, H₂ safety training: E-Academy – setting up of Europe-wide educational projects and development of first academy of H₂ safety curriculum ; InsHyde (internal releases in small confined spaces); HyTunnel (H₂ safety in tunnels).



Demonstration Project Update

- × FP6 (2002-2006), 56 M€ allocated to hydrogen demonstration projects. 5 projects related to **“Hydrogen for Transport”** (EC funding 48 M €); one project on poly-generation (EC funding 8 M €) .
- × **“Hydrogen for Transport”** coordinates the projects, enhances visibility, prepares the way for future projects for bridging gap between the prototypes and the market for hydrogen vehicles.
- × **> 200 hydrogen vehicles** to be demonstrated (buses, passenger cars, mini cars, motor cycles and even wheel chairs) as well as the corresponding hydrogen supply infrastructure.
- × **CUTE/ECTOS** project successfully operated 27 hydrogen fuel cell buses in 10 European cities during the last two years;
 - ✓ **more than 1,000,000 Km**
 - ✓ **70,000 hours in regular public transport services;**
 - ✓ **availability rate 80 to 90%, including the hydrogen supply infrastructure.**





EU projects proposed for IPHE recognition

- × Seven EU projects with IPHE dimension proposed in 2006 round for IPHE recognition
- × Four successful IPHE related proposals in March 2006 solicitation
 - ✓ Hydrogen storage (HySIC)
 - ✓ Generation of new ionomer membranes (IPHE-GENIE)
 - ✓ Pathways and Socio-economic analysis HyWAYS-IPHE
 - ✓ Safety, regulations, codes and standards FCTEDI
- × These proposals extend the IPHE dimension of running EU projects which have IPHE recognition



Events and Solicitations

Solicitations:

- × The Sixth Framework Programme (2002-2006) is closing. No more solicitations until FP7 (2006-2013);
- × first calls are expected towards the end of 2006, closing early 2007. Adoption of FP7 by the European Council and Parliament is expected by end 2006.
- × RTD and D on hydrogen and fuel cells to be carried out mainly under the energy, transport, materials and production themes of the "Co-operation" Programme and under also under a projected Joint Technology Initiative.

<http://cordis.europa.eu/fp7>

Event:

- × European Hydrogen and Fuel Cell technology Platform Third General Assembly, "From Strategy to Action: Timeline 2015" ; exhibition and Drive&Ride 2006; 5-6 October 2006; Brussels/Belgium:

<https://www.hfpeurope.org/hfp/general-assembly-2006>





Government Hydrogen and Fuel Cell RTD&D Funding

- × **no specific budget allocations** for hydrogen and fuel cell research
- × H₂ & FC proposals compete for funding with other energy, transport technologies under the relevant programme themes.
- × only possible to establish allocations after closure of solicitations and negotiation of successful proposals.
- × FP6 (2002-2006) : total EC funding awarded to contracts relating to hydrogen and fuel cells is estimated at 300m€.
- × includes research, demonstration, training and support to SMEs for innovation.
- × As framework programmes are overlapping, this corresponds to an average annual EC spend of 75m€.

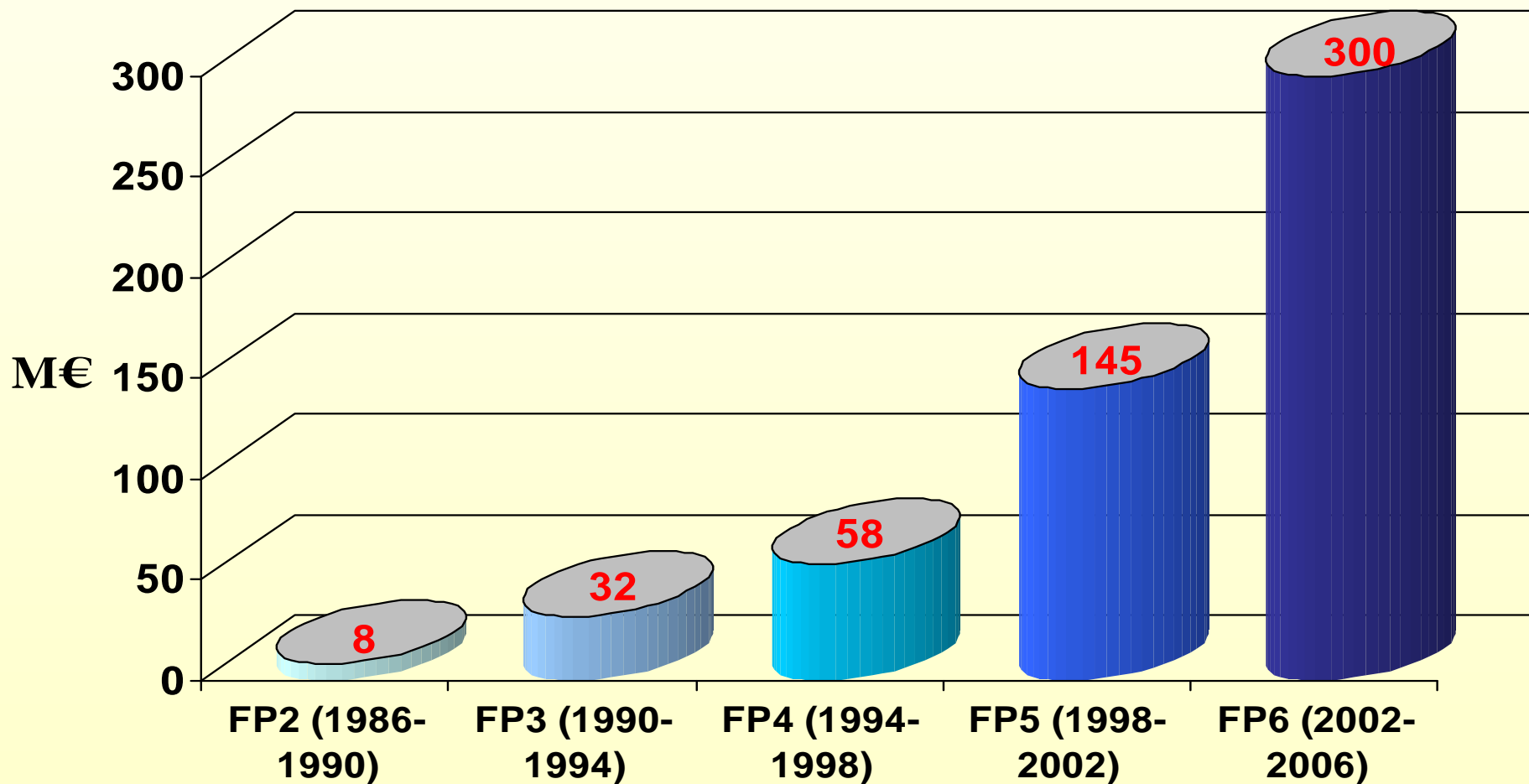




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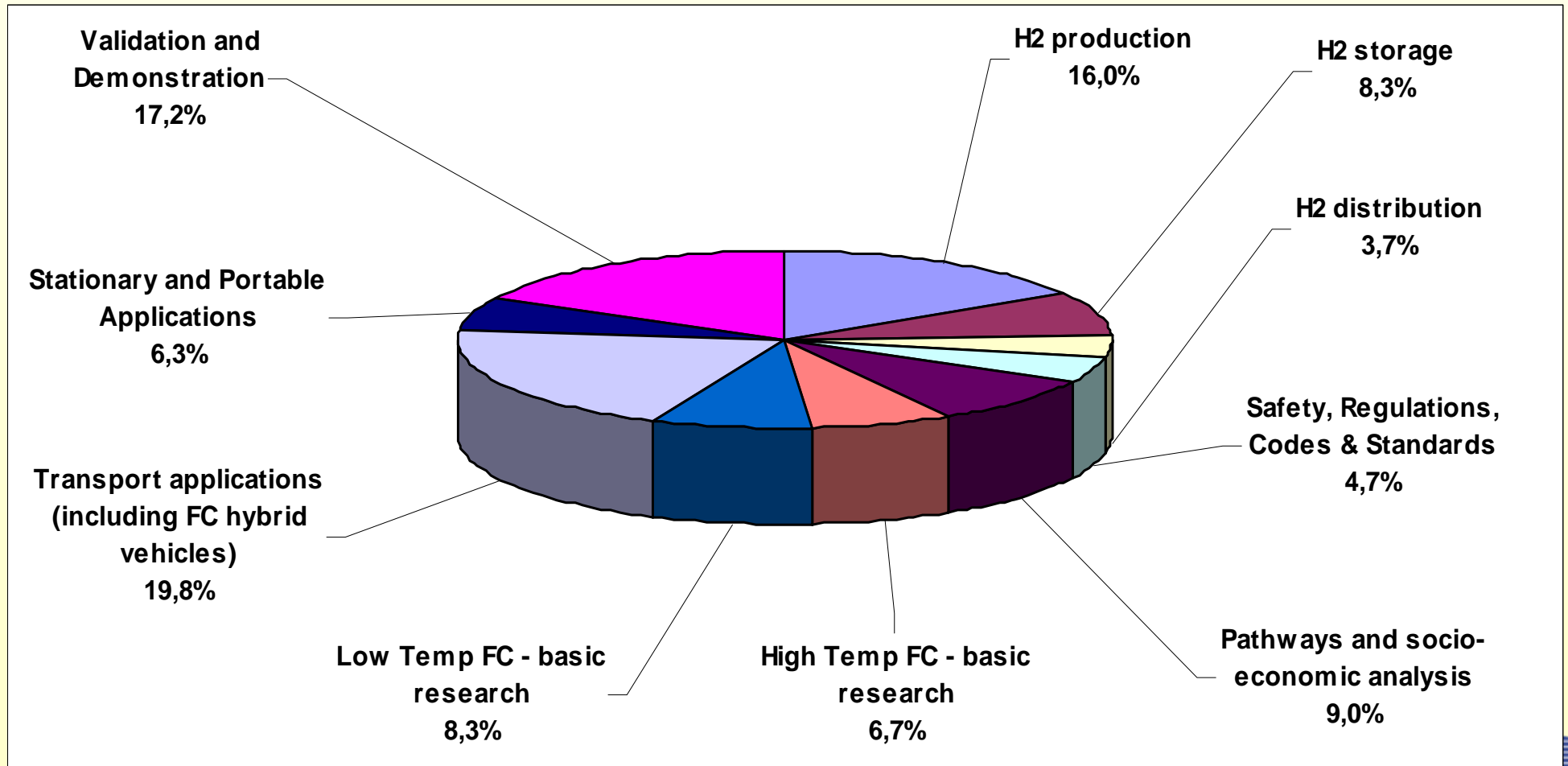
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EC Support to Fuel Cell and Hydrogen RTD in Framework Programmes



FP6 (2002-2006) Budget Breakdown H2/FCs

Total EC Contribution up to date ~300 M€





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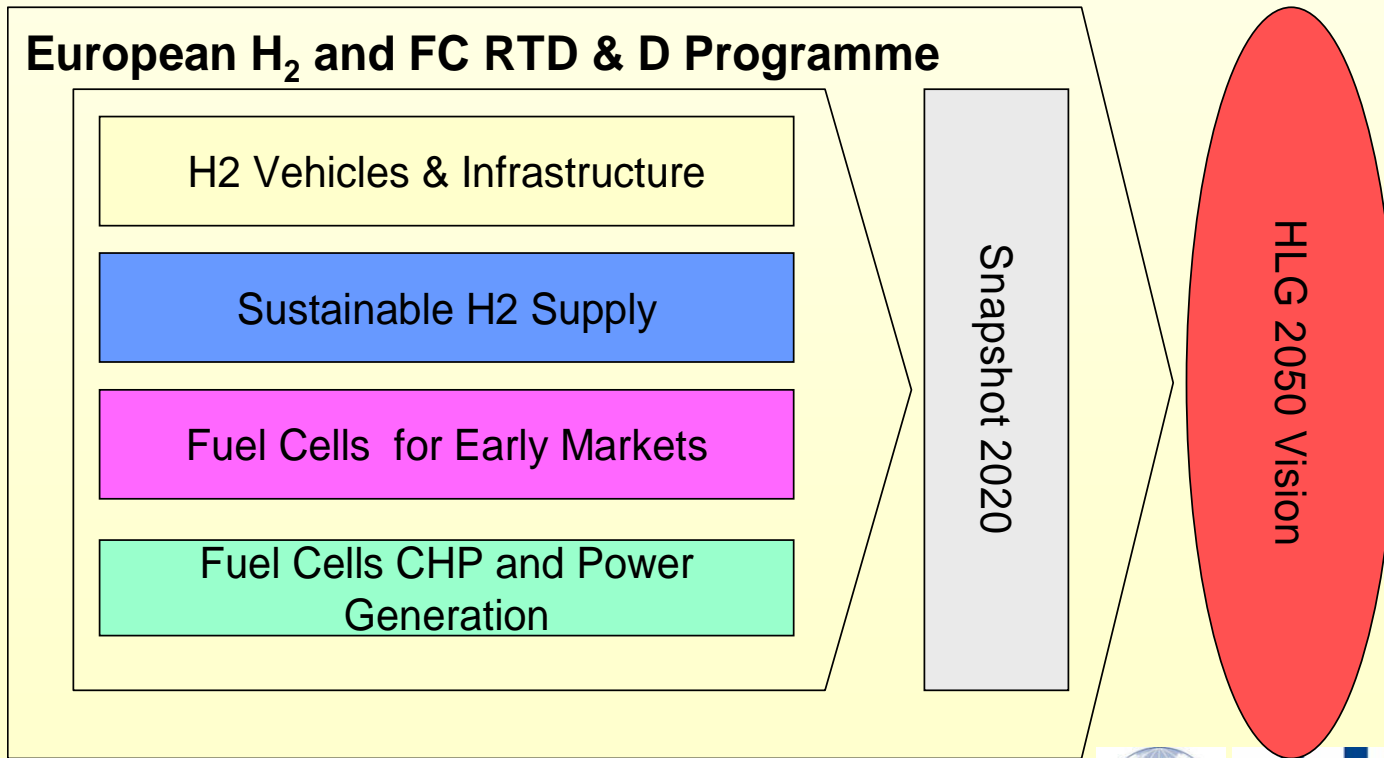
Evolution of the European Hydrogen and Fuel Cell Technology Platform.



Draft Implementation Plan - Status 2006

RTD&D Programme Underpinning – “Snapshot 2020”

Draft Implementation plan proposes RTD&D programme with four main action areas:





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7th Framework Programme (FP7)

Joint Technology Initiative





FP7 timetable

Next steps (indicative):

- ✓ **End 2006** Adoption of FP7 package
- ✓ **End 2006 opening** Definition of Workprogramme and call for proposals
- ✓ **Dec. 2006** First calls under FP7, closure call spring 2007
- ✓ **Feb 2007** Launch conference (Brussels)
- ✓ **Early 2007** proposal for JTI from EC
- ✓ **2nd half of 2007** Launch of JTI (if adopted)
- ✓ **End 2007** JTI 1st call of proposals
- ✓ **2008** JTIs projects in place



Joint Technology Initiative (JTI)

- ✗ **JTI: new instrument and new management structure**
- ✗ **More efficient organisation of the RTD&D resources across Europe**
- ✗ **Aims to build sufficient critical mass; bulk of EU H2 and FC applied RTD&D aligned in JTI; fundamental research in the “co-operation” part of FP7**
- ✗ **Key features :**
 - ✓ **Driven by the industries that will have to take large-scale commercialisation decisions**
 - ✓ **Concentrate/align efforts and funding from the industry and research communities with those from European, National, Regional and Local programmes in the form a Public Private Partnership**
 - ✓ **Goal-oriented approach,**
 - ✓ **Optimal integration of research and demonstration actions, with continuous interaction to accelerate progress**
 - ✓ **Concerted effort over the whole supply chain**



- × **Commission proposal for the Seventh Framework Programme (FP7) includes provision for a number of JTIs**
- × **Technology Platform Implementation Panel working to define RTD&D needs to realise “Snapshot 2020” Targets – identifies envelope of H2 and FC RTD&D actions for FP7 and possible JTI – “Implementation Plan -2006”**
- × **Constitutive Committee formed to establish industrial grouping that would form the private side of JTI Public-Private-Partnership**
- × **Commission deliberating on proposals for a number of JTIs**
- × **The target would be to have the JTI established during 2007.**

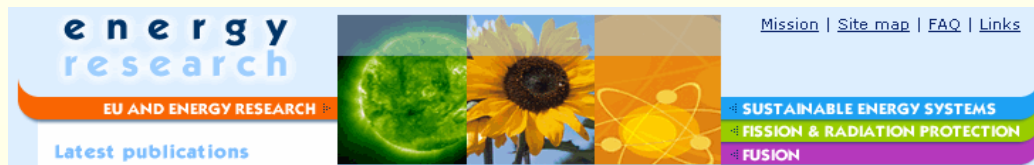


Further Information at:

Energy Research web site and Energy Helpdesk:

http://europa.eu.int/comm/research/energy/index_en.html

rtd-energy@cec.eu.int



Energy Policy

http://europa.eu.int/comm/energy/index_en.html

Calls for proposals

<http://fp6.cordis.lu/fp6/calls.cfm>



Towards Seventh Framework Programme

http://europa.eu.int/comm/research/future/index_en.html



**RENEWABLE ENERGIES FOR EUROPE
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Newsletter, Information days and similar events, conferences

<http://europa.eu.int/comm/research/energy/pdf/renews4.pdf>

http://europa.eu.int/comm/research/energy/gp/gp_events/action/article_2790_en.htm



European Hydrogen and Fuel Cell Technology Platform

www.HFPeurope.org



Joint Research Centre

<http://www.jrc.cec.eu.int>

