



EUROPEAN  
COMMISSION

Community Research

# “High Temperature Fuel Cells in the European Union”

**2004 High Temperature Working group meeting  
Philadelphia,  
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**Mr. Hugues Van Honacker  
Unit “Energy production and distribution systems”  
DG Research – RTD/J-2**



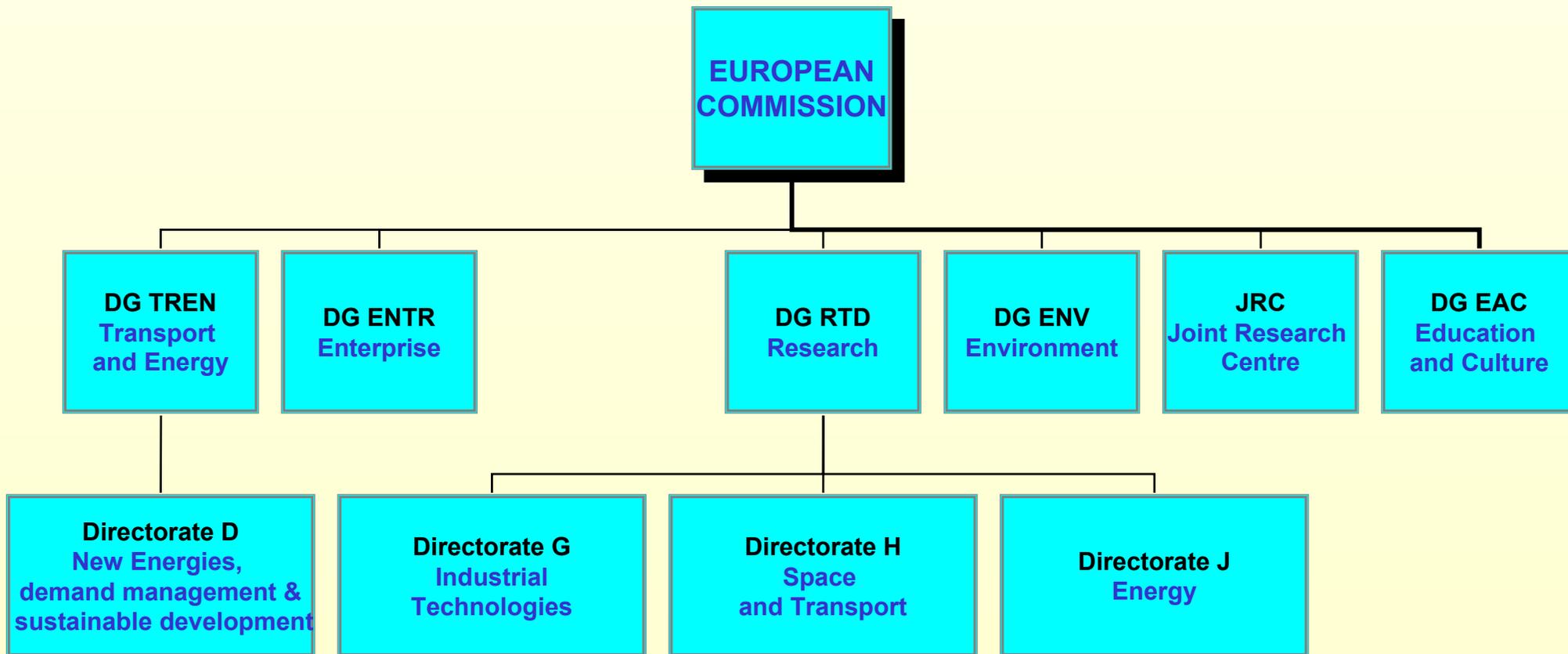


# The European Commission

- ✘ The **European Union** (EU) is a treaty-based association of European countries that defines and manages economic and political cooperation among its European member countries. From May 1st 2004, the EU includes **25** member countries.
- ✘ The **European Commission** (EC) is the executive arm of the EU institutions and embodies the general interests of the EU. It proposes policies and legislation and implements the measures approved by the governments of the member states, which together constitute the European Council, and by the European Parliament.
- ✘ Its responsibilities include policy areas such as trade, competition, agricultural policy and economic development, but also research, public health and humanitarian aid.
- ✘ The EC has ~18.000 employees and the departments responsible for the various policy areas are called **Directorates-General** (DG).



# EC DGs related to Hydrogen and Fuel Cells





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# EU Framework Programme for Research and Technological Development



# What is the EU's Research Framework Programme (FP) ?

- **Main instrument** for research funding in the EU since 1984.
- **Proposed by the European Commission** and adopted by Council and the European Parliament
- Covers a period of **5 years** with the last year of one FP overlapping the first year of the following FP
- **Key principles:**
  - ✗ only projects involving **several partners** from **different countries** are funded; there are no “national quotas”
  - ✗ funds are allocated following competitive “**calls for proposals**”
  - ✗ projects are only **eligible** for funding if their scope and objectives reflect priorities as outlined in “calls for proposals”;
  - ✗ quality and technological relevance of proposals are assessed by external, **independent experts**;
  - ✗ Any legal entity established in a **third country** which has concluded a S&T cooperation agreement **may take part in FP activities.**



# FP6: Objectives, priorities and budget

- ✓ The main objective of FP6 is to contribute to the creation of a true “**European Research Area**” (ERA).
- ✓ **ERA** is a vision for the future of research in Europe, an internal market for science and technology. It fosters scientific excellence, competitiveness and innovation through the promotion of better co-operation and coordination between relevant actors at all levels.
- ✓ The total **budget** for FP6 is **€17.5 billion**, which is an increase of 17% respect to FP5. It represents close to **4% of the EU’s overall budget** (2001), and **5.4% of all public** (non-military) research spending in Europe. 7% of this amount (€1,230 million) will be spent on nuclear research.
- ✓ The biggest part of FP budget (12, 585 M€) will be spent on “**focussing and integrating**” future research activities on eight thematic priority areas (see next overhead). The rest will be spent in activities to strengthen and structuring the ERA.





# Practical implementation of FP6

- ◆ FP6 is implemented via a number of “traditional” and “new” instruments, each of which has their own set of objectives and conditions for participation.
- ◆ The main part of their programme is implemented via a limited number of significant multi-disciplinary and multi-partner **Integrated Projects** (IP) and **Networks of Excellence** (the ‘new instruments’).
- ◆ A small part of the programme though traditional instruments are similar to those in FP5 and include: Specific Targeted Research Projects (**STREPs**), **co-ordination** actions, **specific support** actions and specific projects for **SMEs**.
- ◆ Projects are selected via **call for proposals** for which EC contribution depends on the type of instruments. For instance, for IPs / STREPs it is up to 50% (35% if demonstration) of the total project costs.
- ◆ For all these actions, there is always an organisation (i.e. the “**Project Co-ordinator**”) responsible for the management and technical direction of the project.





# Framework Programme 2002-2006 (FP6)

*“Focussing and Integrating European Research”*

## Thematic Priorities

1. Genomics and biotechnology for health (2,255 M€)
2. Information Society technologies (3,625 M€)
3. Nanotechnologies, intelligent materials and new production processes (1,300 M€)
4. Aeronautics and space (1,075 M€)
5. Food safety and health risks (685 M€)
- 6. Sustainable development and global change (2,120 M€)**
7. Citizens and governance in a knowledge-based society (225M€)
8. Specific activities covering a wider field of research (1.300M€)





# FP6 - 2002-2006

## Focussing and integrating European Research

### Priority 6: “Sustainable Development, Global Change and Eco-systems”

- Sustainable Energy Systems (810 M€)
- Sustainable Surface Transport (610 M€)
- Global Change and Eco-systems (700 M€)





# FP6 - Research on Hydrogen and Fuel Cells

Research on hydrogen and fuel cells is implemented in Thematic Priority 6, in particular under:

## “Sustainable Energy Systems”

- ◆ *Energy savings and energy efficiency* (S-M Term)
- ◆ *Alternative motor fuels* (S-M term)
- ◆ *Fuel cells, including their applications* (M-L Term)
- ◆ *New technologies for energy carriers/transport and storage* (M-L Term)
- ◆ *New and advanced concepts in renewable energy technologies* (M-L Term)

## “Sustainable surface transport”

- ◆ *New technologies and concepts for all surface transport modes* (M-L Term)



# Call FP6-2003-ENERGY 1 ML

## Retained projects - Hydrogen

Area	Project Acronym	Type of Action	Topic	EU indicative funding (M€)	Co-ordinator
H2 production	CHRISGAS	IP	Hydrogen rich gas from biomass	9,5	Växjö University, Sweden
	SOLREF	STREP	Solar MSR for synthesis gas Production	2.1	DLR, Germany
	HYTREC	STREP	High Temperature Thermochemical cycles	1,9	CEA, France
	Hi2H2	STREP	Solid oxide water Electrolyser	0,9	EDF, France
H2 storage	STORHY	IP	Next generation storage technologies for on-board applications	10.7	Magna Steyr Fahrzeugtechnik, Austria
H2 safety, regulations, codes & standards	HYSAFE	NOE	Networking research in safety issues	7	Forschungszentrum Karlsruhe, Germany
	HARMONHY	SSE	Harmonisation of Standards and regulations	0.5	Vrije Universiteit Brussel, Belgium



# Call FP6-2003-ENERGY 1 ML Retained projects – Hydrogen (Cont.)

Area	Project Acronym	Type of Action	Topic	EU indicative funding (M€)	Co-ordinator
<b>H2 pathways</b>	HYWAYS	IP	Elaborating a European Hydrogen Roadmap	4	L-B Systemtechnik, Germany
	HYCELL-TPS	SSA	European H2/FC Technology Platform Secretariat	0.5	Ernst & Young, Belgium
	NATURALHY	IP	Investigating infrastructure requirements for H2 and natural gas mixes	11	Gasunie, The Netherlands
	INNOHYP-CA	CA	Innovative high temperature production routes for H2 production	0.5	CEA, France
<b>H2 end use</b>	ZERO REGIO	IP	H2 FC fleet demonstration	7,5	INFRASERV, Germany
	HYICE	IP	Internal combustion engines	9	BMW, Germany
	PREMIA	SSA	Effectiveness of demonstration initiatives	1	VITO, Belgium



# Call FP6-2003-ENERGY 1 ML

## Retained projects - Fuel Cells

Area	Project Acronym	Type of Action	Topic	EU indicative funding (M€)	Co-ordinator
High Temperature Fuel Cells	Real-SOFC	IP	Next generations SOFC planar technology	9	Research Centre Jülich (FZJ) (Germany)
	BIOCELLUS	STREP	Biomass Fuel Cell Utility System	2,5	TU Munich (Germany)
	GREEN-FUEL-CELL	STREP	SOFC fuelled by biomass gasification gas	3	CCIRAD (France)
Solid Polymer Fuel Cells	HYTRAN	IP	Innovative systems and components for road transport applications	9	Volvo (Sweden)
	FURIM	IP	High temperature polymer electrolyte membrane (PEM)	4	DTU, Technical University of Denmark
Portable applications	MOREPOWER	STREP	Compact direct (m)ethanol fuel cell	2,2	Geesthacht Research Centre, GKSS (Germany)



# FP6: Next Calls for Proposals

- × **Eol exercised closed on March 2004: more than 100 Eols on H2 and Fuel Cells received**

**Assessment in April 2004**

**Conclusions published in May 2004**

- × **WP revision under discussion: Basis:**
  - ✓ Existing portfolio: outcome of 1st call
  - ✓ Stakeholder views: conclusions of General Assembly
  - ✓ Joint calls envisaged with other Programmes: with nano-technologies, materials and production technologies, aeronautics and sustainable surface transport
- × **WP to be approved before Summer**
- × **Next Call closing in December 2004**





# High Temperature Membrane Fuel cell

EU project	Starting Date	Duration	EU Contribution	Coordinator	Membrane technology	Temperature target	Fuel
PEM-ED	1/04/2000	54 m	1,6 millions Euro	FUMATECH	Hybrid organic/inorganic	130°C~150°C	H2
DREAMCAR	1/02/2001	48 m	2,9 millions Euro	THALES	PFSA family	130°C	Me OH
OPTIMERECELL	1/11/2002	36 m	1,5 millions Euro	INASMET	PFSA family	120°C	H2
APOLLON	1/12/2001	36 m	2,5 millions Euro	FORTH	PBI/SPSF Blends	>150°C	H2
AMFC	1/01/2001	44 m	2,5 millions Euro	VOLVO	PBI blends/Composites	180°C ~200°C	H2
FURIM (FP6)	1/04/2004	48m	4 millions Euro	DTU	Acid Doped PBI	180°C ~200°C	H2
PORTAPOWER	1/11/2002	36 m	2,2 millions Euro	APC Denmark	Sulfonic copolymer	150°C	Me OH





# Staying Informed

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## International co-operation

[http://europa.eu.int/comm/research/fp6/index\\_en.html](http://europa.eu.int/comm/research/fp6/index_en.html)

## Cordis FP6 Service

<http://www.cordis.lu/fp6/>

## Energy Research at Europa

[http://europa.eu.int/comm/research/energy/index\\_en.html](http://europa.eu.int/comm/research/energy/index_en.html)

## Energy research/technology platform

[http://europa.eu.int/comm/research/energy/nn/nn\\_rt\\_http1\\_en.html](http://europa.eu.int/comm/research/energy/nn/nn_rt_http1_en.html)

## CIRCA website – download presentations and documents

<http://forum.europa.eu.int/Public/irc/rtd/eurhydrofuelcellplat/library>





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# Thank you!

Hugues Van Honacker

European Commission

Phone: +32 2 2985132

Fax: +32 2 2964288

E-mail: [Hugues.van-honacker@cec.eu.int](mailto:Hugues.van-honacker@cec.eu.int)

[http://europa.eu.int/comm/research/energy/index\\_en.html](http://europa.eu.int/comm/research/energy/index_en.html)

