

German Hydrogen & Fuel Cell Technology Update

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Summary 2005

- Continuation of **R&D** and **demonstration** programmes on **Federal** and **Federal States** level
 - ⇒ Strategy broadly defined in the **5th Federal Energy Research Programme** (July 2005)
- Establishment of the Hydrogen and Fuel Cell Expert Council **HYBERT** in 2005, coordination of activities by National Coordination Office **NKJ**
- Involvement in European (**HFP**) and international activities (**IPHE, IEA**)



“Innovation and New Energy Technologies”

One main focus is placed on
hydrogen and fuel cells



Priorities for Hydrogen and Fuel Cells

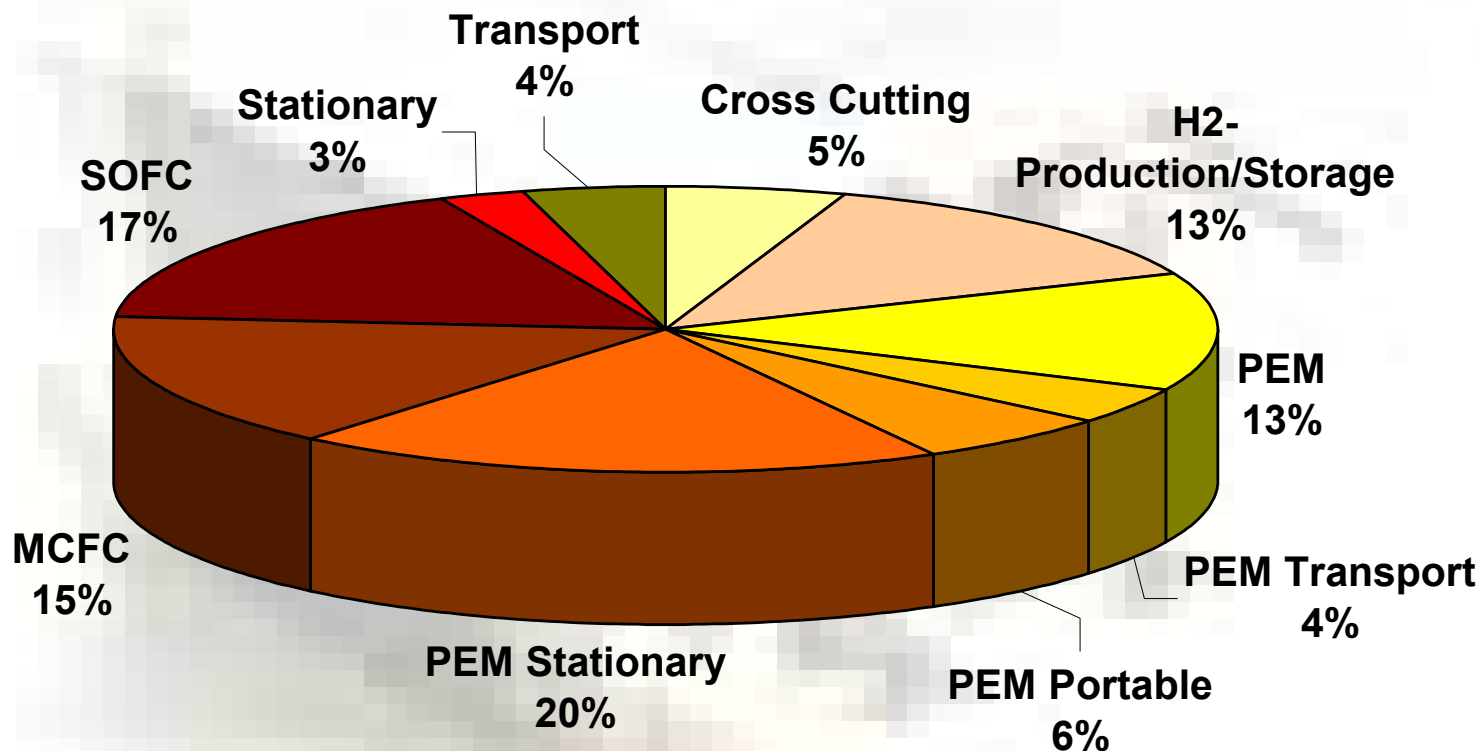
- The following technologies will be funded in the future with the main goals: **cost reduction, increase of lifetime and reliability**
 - PEMFC and DMFC
 - MCFC
 - SOFC
- With regard to hydrogen funding will be granted
 - **H₂-production** without CO₂ (e.g. by CCS)
 - **H₂-storage** upon new results of basic research (materials etc.)
- The approaching market introduction has to be accompanied by
 - stronger involvement of small and medium sized companies (**SME**) particularly as component suppliers
 - tailor-made **qualification** measures

Total Public Funding in Germany

- **Total public funding in Germany: approx. 65 – 75 million €/year**
 - **Federal Ministries: 30 – 35 million €/year**
(lion's share Federal Ministry of Economics and Technology)
 - **Federal States: 18 – 22 million €/year**
(lion's share Nordrhein-Westfalen, Bavaria and Baden-Württemberg)
 - **Other public funding organisations: 2 – 3 million €/year**
 - **Institutional funding: approx. 15 million €/year**
- **Nordrhein-Westfalen:**
 - **58 projects**
 - **Total budget: 106 million €**
 - **Total funding: 55 million €**

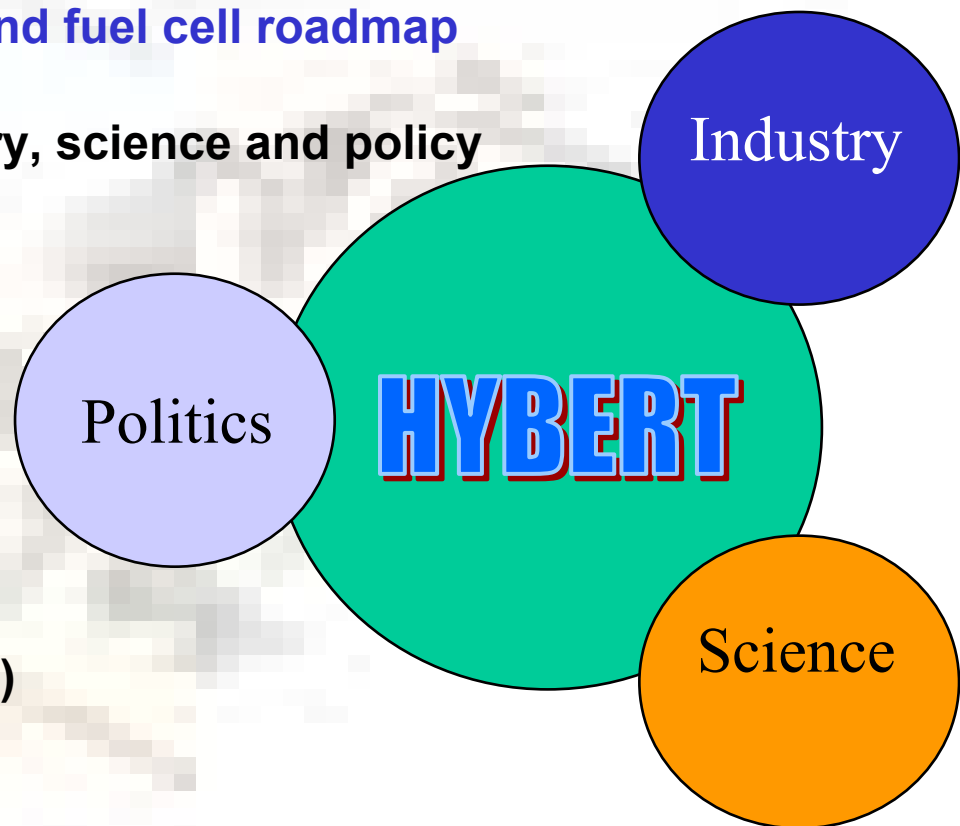
Total Private Funding >> Total Public Funding

Breakdown of Funding of Federal Ministries



Establishment of the Hydrogen and Fuel Cell Expert Council HYBERT in 2005 with following mission

- Development of a **national hydrogen and fuel cell roadmap**
- **Information exchange** between industry, science and policy
- Temporary **working groups** for special tasks (e.g. education)
- Communication of results in **national and international** institutions; public relation
- Interaction with European and international activities (**HFP, IEA, IPHE**)



Stationary Application in Nordrhein-Westfalen (NRW)

Power and heat supply of a residential area

- Application: power and heat supply of a residential area in Krefeld by a central fuel cell
- Fuel cell: **MCFC** by MTU CFC Solutions ($250 \text{ kW}_{\text{el}}$, $180 \text{ kW}_{\text{th}}$, temperature 75 to 110 °C)
- Goal: test and evaluation of different control and operation modes for the **coupling to local grids**, impacts on **durability** and **availability**
- Partners: Local supplier with RWE Fuel Cells and DaimlerChrysler
- Total cost: 2.6 million €, NRW-funding: 0.9 million €
- Duration: December 2003 to June 2007



Applications in NRW around FIFA World Cup 2006 in Germany



- Basis: **Prototype development** of fuel cell applications by NRW companies
- **Deployment** of a small first series around **FIFA World Cup**
- Subsequent **application** in **regular operation conditions**
- Strategic objectives
 - **Cost reduction** by gathering experiences and producing higher quantities
 - Using World Cup to increase **public awareness**

NRW involved in EU-Project “HYCHAIN-MINITRANS”



- HYCHAIN-MINITRANS: 25 partners a network in 4 major regions
- HYCHAIN-MINITRANS project will deploy approx. 180 innovative fuel cell vehicles operating on H2
- Presentation of HYCHAIN-MINITRANS with applied vehicles
 - 3rd International German Hydrogen Energy Congress 2006, 15-16 February 2006, Essen (NRW)
 - Hannover Fair, NRW booth on H2/FC 24-28 April, Hannover (Germany)
- Start: January 2006

Competence Atlas of the Fuel Cell and Hydrogen Network NRW

- More than **300 members** in the network are presented in the Competence Atlas
 - companies (SME), research institutes
 - systems, components, materials, users
 - NRW, Germany and Europe
- For the straightforward finding of appropriate **partners for cooperation**
- Detailed representation** of partner's expertise, convenient search with key words via "**competence matrix**"
- In German and **English** language
- More information: www.fuelcell-nrw.de



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Forschungszentrum Jülich
in der Helmholtz-Gesellschaft



***See you 2010 in Germany,
please calendar it!***

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The **Hydrogen Energy Economy**