

German Hydrogen & Fuel Cell Technology Update

Nilgün PARKER

Federal Ministry of Transport, Building & Housing (BMVBW)

parker@bmvbw.bund.de

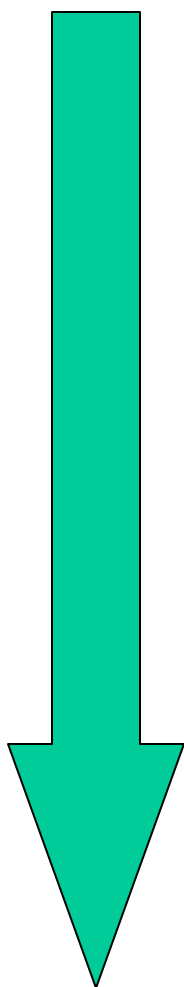
**IPHE Steering Committee
Kyoto, 14 September 2005**

1995

1996 - 2001

2001- 2004

2004

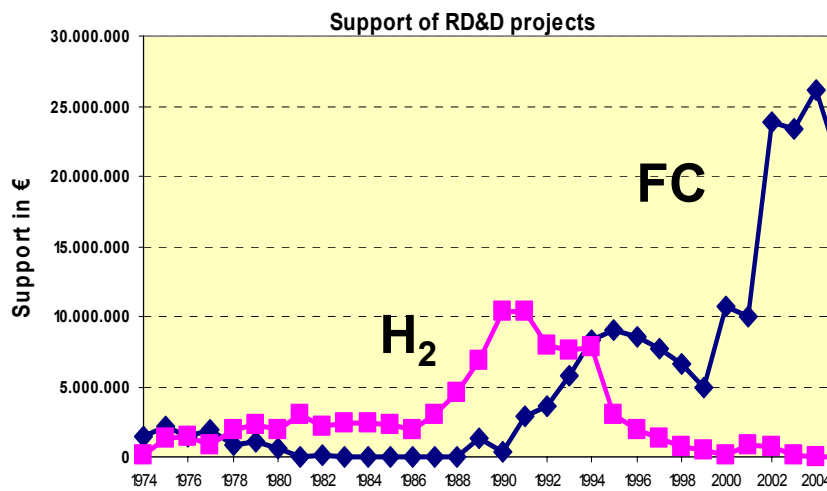


- ➔ **Conclusion from results up to 1995:**
 - all components of a solar hydrogen system were developed and functioning
 - economically not feasible because of high system costs

- ➔ **Hydrogen R&D activities reduced**
 - Priority for fuel cell R&D

- Investing - into - the - Future Programme (ZIP) for fuel cell demonstration and market preparation

- Clean Energy Partnership (CEP): Hydrogen demonstration project in Berlin





German Hydrogen Technology Update

Summary 2005

- Continuation of R&D and demonstration programmes on Federal and Federal States Level: Strategy broadly defined in the latest 5th Federal Energy Research Programme
- Micro-FuelCells Programme (20 Mio. €)
- Preparation of newly structured co-ordination through HYBERT Advisory Council and NKJ National Co-ordination Office Jülich
- Involvement on European Level: Hydrogen&FuelCells Technology Platform
- Successful National Demonstration Projects, e.g. opening of a 2nd public H₂-filling station in Berlin



The 5th Energy Research Programme

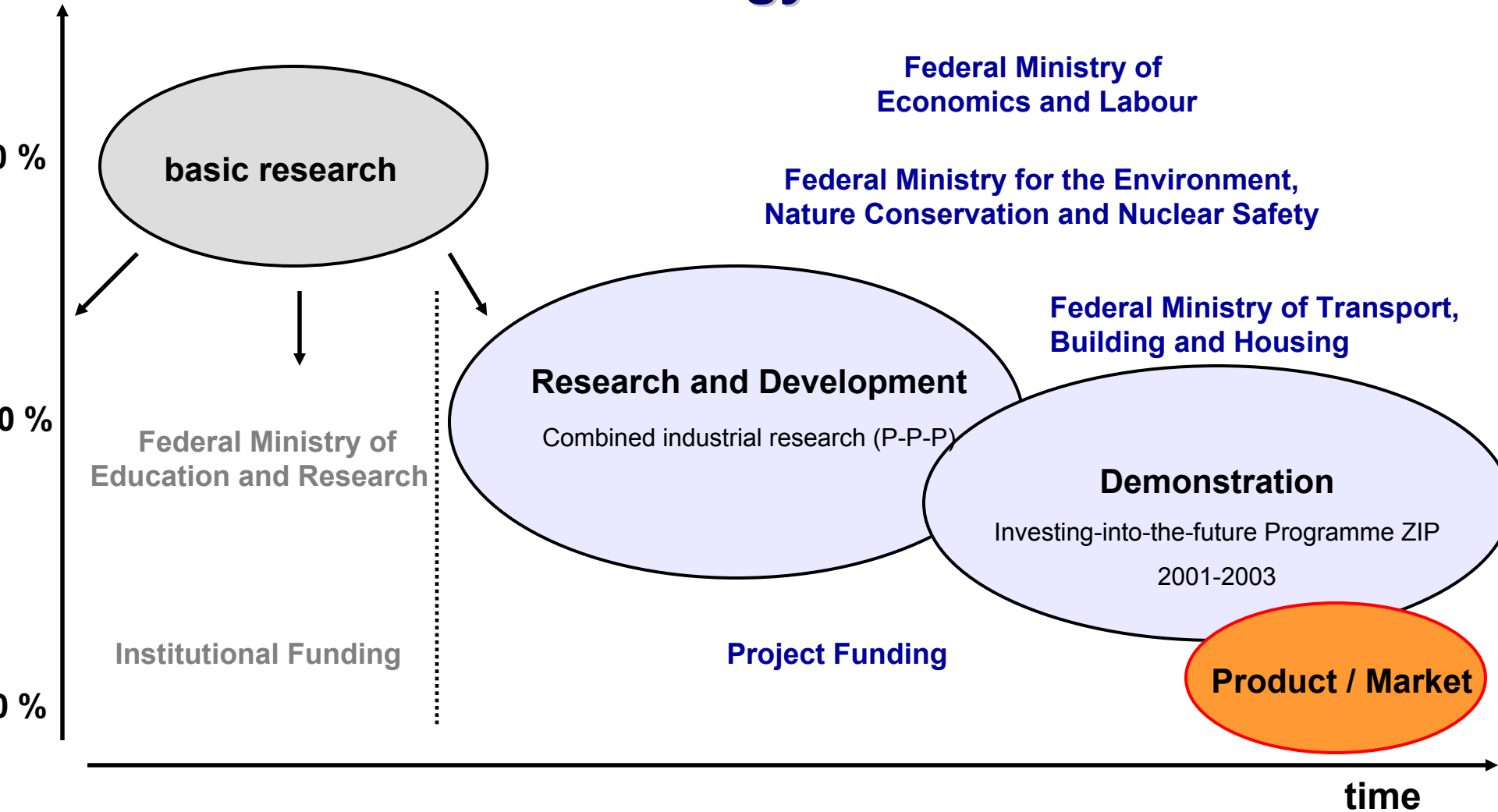


- **Published in July 2005**
- **4 Federal Ministries involved:**
 - Economics and Labour (BMWA)
 - Environment (BMU)
 - Agriculture (BMVEL)
 - Research (BMBF)
- **Total Budget**
 - 1998 → 2008: 392 → 428 million €
- **Budget for Energy Efficiency and Renewables**
 - 1998 → 2008: 178 → 259 million €



Innovation Strategy: New National Goals

Subsidies





Market introduction of Hydrogen & Fuel Cells

Strategic Objectives:

- ➔ Research and development collaboration to progress technology – nationally and in Europe
- ➔ Reduce development and production times: Technological progress and larger number of FC produced will lead to cost reduction and reliable products
- ➔ Request for time-limited and degressive market introduction instruments

Aim:

- 1. Pool resources:** “Partnership for Innovation” of industry, science and policy
 - 2. Updating funding policy in the field of hydrogen technology:** Additional funding for commercialization
 - 3. Programme of work:** commercialization (Lighthouse-Projects)
- ➔ Support measures and budget currently under investigation



Clean Energy Partnership (CEP)

Hydrogen demonstration project in Berlin
To demonstrate the reliability of hydrogen
in everyday motor vehicle operation

- Start: Nov. 2004, duration: 5 years
- Hydrogen: gaseous and liquid
- 16 vehicles from BMW, Daimler-Chrysler, Ford and Opel with ICE and FC
- Total cost: 33 million €
- Supported with 5 million € by Federal Ministries of Transportation, Economy and Environment



www.cep-berlin.de





Bundesministerium
für Verkehr, Bau-
und Wohnungswesen

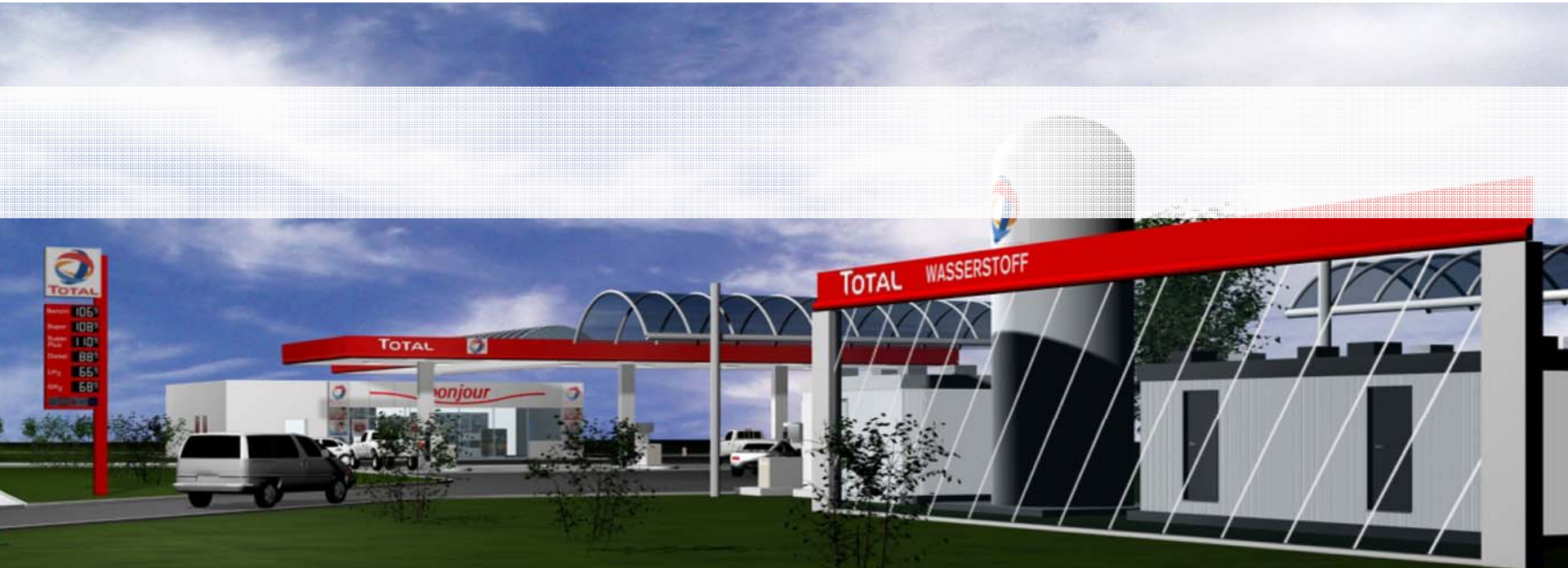


Bundesministerium
für Bildung
und Forschung



Bundesministerium
für Wirtschaft und Arbeit

2nd public H₂-Filling Station in Berlin: opening November 2005



Construction of a public, integrated H₂-filling station in Berlin-Spandau
 Start of Operation: November 2005
 Delivery of Liquid H₂ (LH₂) by Linde
 Production of gaseous H₂ (CGH₂) on site via reforming of LPG-Gas
 Two stationary fuel cells generating electrical power for the station and the grid as well as warmth for the heating of the station
 H₂-bus-fleet operation

Lighthouse-Idea Hamburg



Bundesministerium
für Verkehr, Bau-
und Wohnungswesen



Bundesministerium
für Bildung
und Forschung



Bundesministerium
für Wirtschaft und Arbeit

Project Partners:

Airbus Deutschland GmbH, Behörde für Stadtentwicklung und Umwelt, European Fuel Cell GmbH HDW-Fuel Cell Systems GmbH, Hamburger Hochbahn AG, Hermes Logistik Gruppe, HEW, Still GmbH



cars, buses



ferries



H2-fuelling



Forklifts



aviation



Stationary FCs
(heating)



Outlook

- ➔ Improved national coordination and networking on policy/industry/science level (HYBERT Strategy Council)
- ➔ Defining a comprehensive H2 / FC Roadmap for Germany, including regional, national, European and international cooperation
- ➔ Focus: Product/Market development (Industry is pressing for action – policy has to respond)
- ➔ Focus Europe: European cooperation will gain more importance and will be of influence on Germany's strategy