

THE EUROPEAN INDUSTRY GROUPING  
FOR A FUEL CELLS AND HYDROGEN JOINT TECHNOLOGY INITIATIVE



## **The Fuel Cells and Hydrogen**

**Joint Technology Initiative – Unique opportunity to prepare  
market introduction of Fuel Cell and Hydrogen Technology**

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**Prof. Herbert Kohler  
Stakeholders General Assembly, Brussels 14.10.2008**

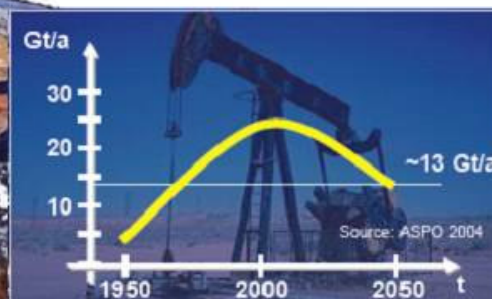
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## Responsibility for the Blue Planet: Need for sustainable energy supply and use

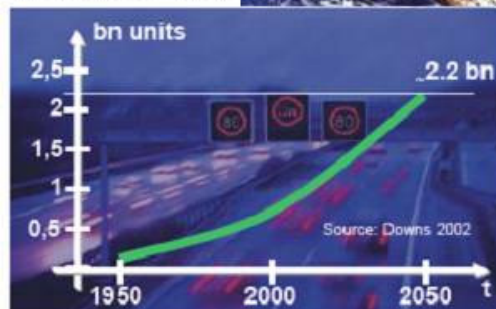
World Population



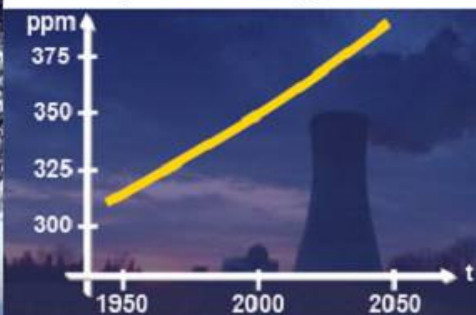
Limited Resources



World Mobility



Atmospheric CO<sub>2</sub> growth rate



Key Elements for a sustainable future:

- Reduction of green-house-gas emissions
- Alternative energy sources and fuels
- Efficient use of energy

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### Hydrogen and Fuel Cells have the highest potential to contribute to energy security and climate protection

#### Why fuel cells ?

- Fuel cells offer significantly higher efficiency in transport as well stationary applications
- Fuel cells are a zero emission technology when operated with hydrogen
- Fuel cell vehicles exhibit high dynamics and driving agility
- Fuel cell vehicles provide for additional internal/external electrical car appliances (e.g. air conditioning while standing)
- Fuel cell vehicles create low noise (especially important in urban areas)

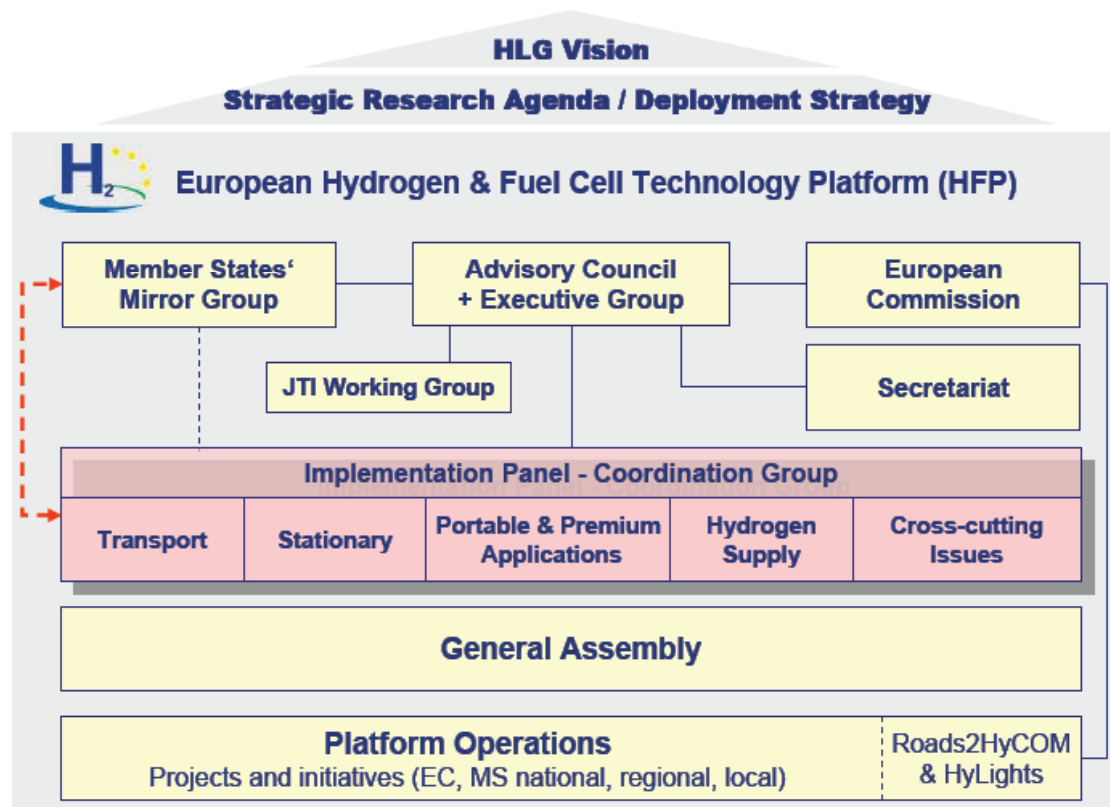
#### Why hydrogen ?

- Hydrogen can be produced from variety of feedstocks, providing a secure energy supply
- Hydrogen leads to reduction of GHG emission, due to increasing share of renewable energy sources for hydrogen production

**Fuel Cell Vehicles realize highly efficient and emission-free mobility.**

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The High Level Group for Hydrogen and Fuel Cells (HLG) and the Hydrogen and Fuel Cells Technology Platform (HFP) have prepared the Joint Technology Initiative for Fuel Cells and Hydrogen to foster FC- and H<sub>2</sub>-Technology



Daimler had a leading role in the HLG and the HFP

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## **Public-Private-Partnerships**

### **Benefits of Public-Private-Partnerships**

- improved understanding between different industry sectors and public organizations
- common definition of technical and legal frame for common activities
- base for exchange between international programmes

### **Lessons learned from ongoing demonstration projects and Public-Private-Partnerships**

- identification of most critical components and processes (CUTE, CEP, ...)
- identification of critical issues and key barriers for commercialisation
- specifications for customer accepted vehicles and infrastructure
- harmonisation and identification of gaps of Codes & Standards

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### **Joint Technology Initiative for Hydrogen and Fuel Cells (FCH JTI) – a Public-Private-Partnership for Europe and a total new approach**

#### **Key characteristics of the JTI include:**

- Market Focus
  - Assure market relevance of supported activities
  - Meet market requirements for mass market introduction
  - Prepare market (public acceptance, infrastructure, C&S, ...)
- Reliable, long-term stable frame for R&D and demonstration activities based on the strategic documents of the HFP
- Efficient Program Management structure

#### **The JTI is needed ...**

- ...to accelerate the transition towards a sustainable energy economy and ensure Europe will take a leading role in global technology development
- ...to leverage efforts in more efficient way and with better focus
- ...to set the frame for coherent research and deployment activities with clear commercialization targets

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## JTI Vision

The vision for the JTI is the establishment of an EU organisation to structure, coordinate research efforts and to manage respective programs efficiently in order to prepare for and accelerate market readiness of fuel cells and hydrogen technologies.

The JTI will:

- ➔ Bring together the European public and private sectors in a partnership that will pursue the required technology developments and will direct and focus resources on these requirements, so that specific relevant products can be developed and demonstrated
- ➔ Provide for the development, validation and demonstration of the range of technologies necessary for effective, efficient and competitive fuel cell and hydrogen products in Europe
- ➔ Provide the leadership for the European fuel cell and hydrogen industries, acting as a focal point for the effective integration and coordination efforts of industry and public entities.

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## JTI Industry Grouping

- ➔ The JTI is set up as a legal entity. Partners are the European Commission, the industry and the research community.
- ➔ Industry is represented in the JTI via an Industry grouping, which is formed as a Belgian non-for-profit association (AISBL=Association Internationale Sans Bût Lucratif). As of today the industry grouping has 65 members
- ➔ The industry grouping currently has 65 members from all over Europe
- ➔ Interested companies are invited to join the industry grouping and together define the industry view on the JTI matters



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## The FCH JTJ has four main Application Areas (AA)

### **AA 1: Hydrogen Vehicles & Infrastructure Technologies**

Improve and validate H<sub>2</sub> vehicle and infrastructure technologies to the level required for commercialisation decision by 2015 & mass market roll-out by 2020

### **AA 2: Sustainable H<sub>2</sub> Supply**

10 – 20 % of the H<sub>2</sub> supplied for energy applications to be CO<sub>2</sub> lean or free by 2015

### **AA 3: Competitive FCs for CHP and Power Generation**

> 1 GW capacity in operation by 2015

### **AA 4: FCs for Early Markets**

X,000 early market FC products in the market by 2010

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## Market Preparation – Worldwide Fleet Operation

- Worldwide fleet operation in demo projects
- Motivation for H<sub>2</sub>-infrastructure

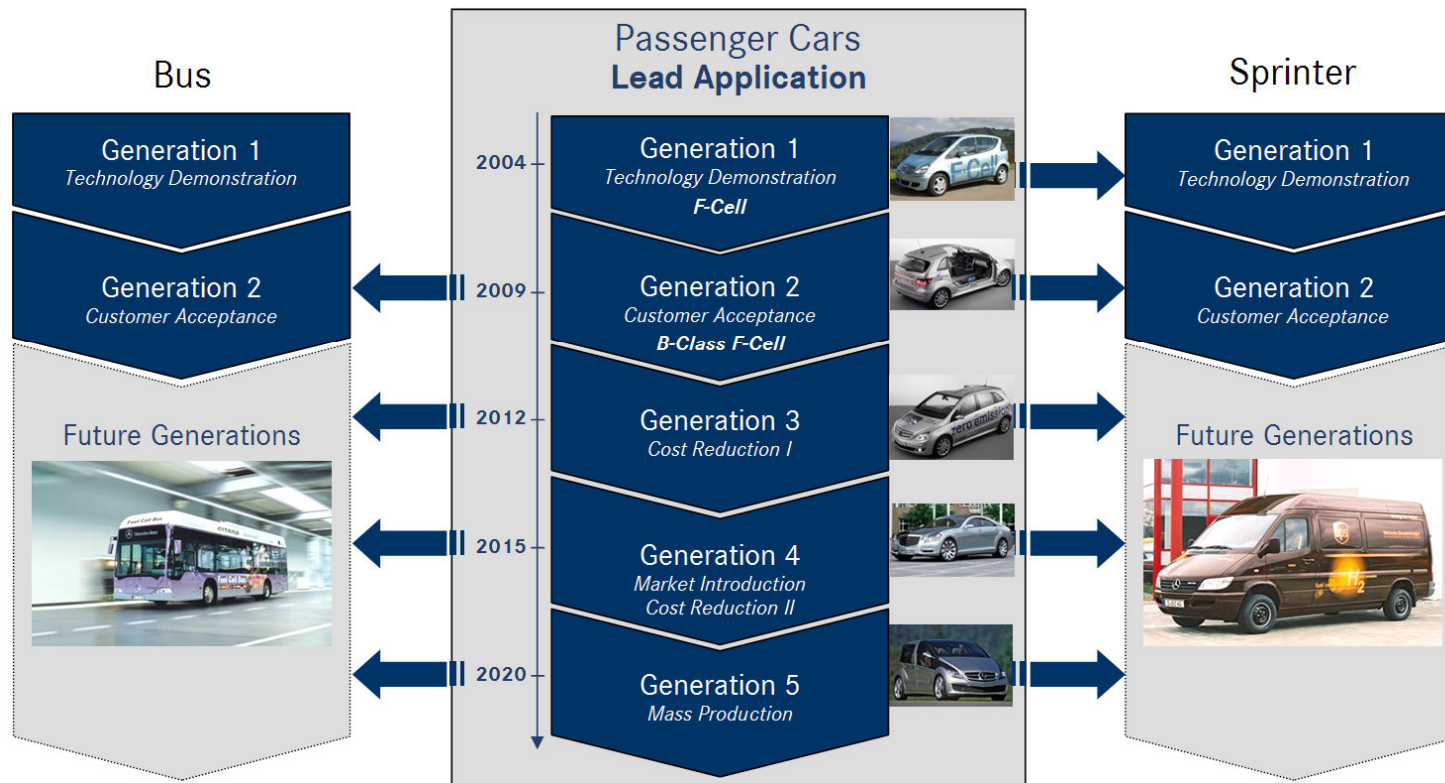


Example: Daimler's FCV demonstration vehicles

60 F-Cell Vehicles in customer operation	36 Buses (Citaro) in Europe, Australia, China	3 Sprinter Europe, USA
		
~ 2.000.000 km ~ 58.000 h	~ 2.100.000 km ~ 136.000 h	~ 64.000 km ~ 2.400 h

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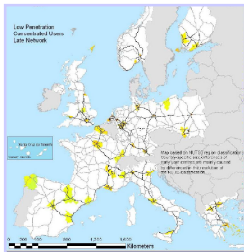
## Daimler's Fuel Cell Technology Roadmap



Daimler is dedicated to commercialize Fuel Cell Vehicles

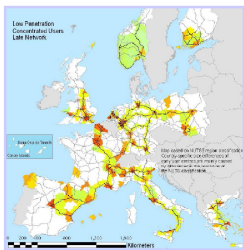
# THE EUROPEAN INDUSTRY GROUPING FOR A FUEL CELLS AND HYDROGEN JOINT TECHNOLOGY INITIATIVE

## Hydrogen infrastructure is key for success of hydrogen vehicles



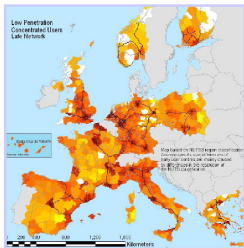
### Phase I: (2006) Isolated Demo

Few hydrogen fueling stations at current demo sites of OEM's



### Phase II: (2010-2015) Mini-Networks

Make H<sub>2</sub> available, affordable and accepted at few selected metro areas



### Phase III: (>2015) Early Commercial

Hydrogen available in dense networks in commercialization phase of FCV

Source: EU-Project HyWays

For successful introduction of Fuel Cell Vehicles the build-up of a hydrogen infrastructure is necessary.

- Development of technical standards for fueling stations needed
- Integration of hydrogen dispensers in existing conventional fueling stations
- Anticipated mass introduction of Fuel Cell Vehicles as of 2015
- Costs of early transition policies appear to be feasible
- Public private partnerships (incentives plus capital) offer biggest opportunities to set up hydrogen infrastructure as a business case

- A network of 15,000 hydrogen stations in the European Union would allow to supply more than **80 percent of the EU population** with hydrogen for cars

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## Stationary applications of fuel cells can help to reduce energy consumption and green-house-gas emissions

### Europe:

Installation of more than 600 systems in 3–5 regions of Germany as Lighthouse projects planned:

- Utilization of low temperature PEM and high temperature SOFC fuel cell technology
- Power output ranges from 1-5 kW
- First field test started

### Japan:

More than 900 PEM CHP-Systems (1 kW) in daily operation by 2007 in 9 different regions

Status as of March 2007:	Site average
Operation days	304 day
Generating hours	14.7 h/day
Supplied electricity	9.3 kWh/day
Supplied heat	13.4 kWh/day



CHP unit from RBZ  
Riesa



CHP unit from Baxi  
Innotech



CHP unit from Vaillant



CHP unit from  
Viessmann



CHP unit from Tokyo Gas



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## Outlook

- ➔ European Commission, Industry and Research Community have joined forces in the FCH JTI to bring hydrogen and fuel cell technology to market success
- ➔ The JTI is a total new approach, the partners will learn how to work together efficiently in the the first phase of the FCH JTI
- ➔ We expect a big step forward towards commercialization of hydrogen and fuel cell technology as well as breakthrough research results
- ➔ The FCH JTI will help to achieve the European goals for sustainability of energy as well as climate protection

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### My requests to the FCH JTI:

#### → **Keep it Simple!**

Avoid red tape. Bureaucracy, i.e. application process for support should be as simple and short as possible to stay attractive for industries and academia.

#### → **Think Big!**

Make sure that big projects with a certain signaling are being supported and realized.

#### → **Be affordable!**

To be attractive for industry and academia, the JTI should not become an exclusive club with high membership fees but no power for its members. Make sure that the membership is attractive with respect to both finance and influence capability.