



# France Member Statement

**Bernard Frois**

# A bird's eye view

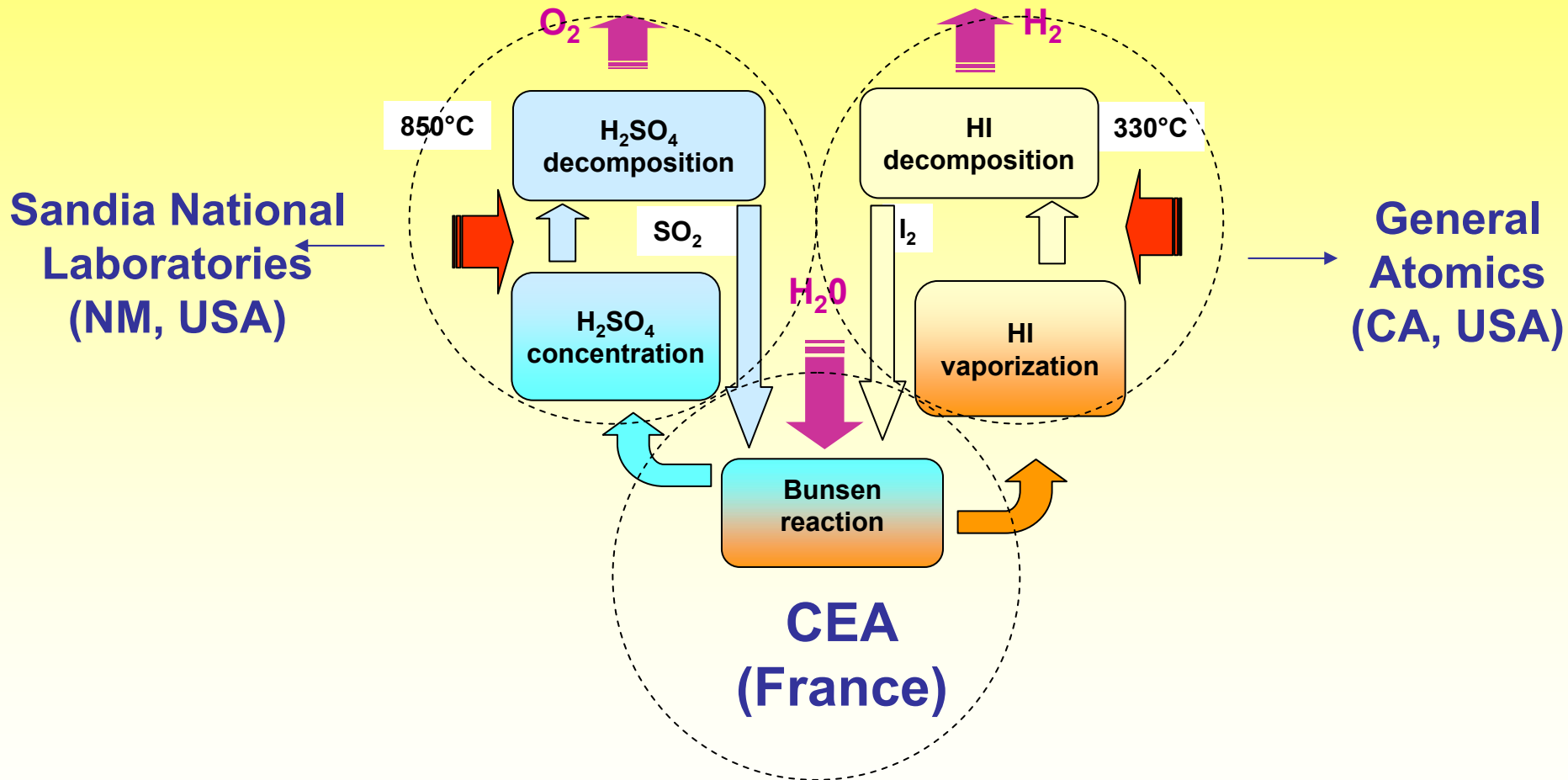
- The importance of Hydrogen R&D is continuously increasing in France.
- The creation in 2005 of the National Research Agency has a major impact on developing public private partnerships (30 M€ in 2005, 40 M€ in 2006) .
- The National Agency for Innovation and Industry is now in the middle of a discussion of large demonstration projects with Industry.
- Hydrogen is a priority for France in the EU 7th FP
- France actively participates in the EU Technology Platform
- The IPHE has a significant impact in France as an international forum

<b>Domain</b>	<b>Share</b>
<b>Production</b>	<b>20 %</b>
<b>Transport, distribution, storage</b>	<b>20 %</b>
<b>Fuel Cell</b>	<b>55 %</b>
<b>Transverse actions</b>	<b>5 %</b>

**Public funding for public-private  
basic research**

**Budget 2006 40 M€**

# Hydrogen Production using S/I cycle



A recent success story

January 2006

## CEA and Peugeot Citroën partnership

80 kW

1.5 KW/kg

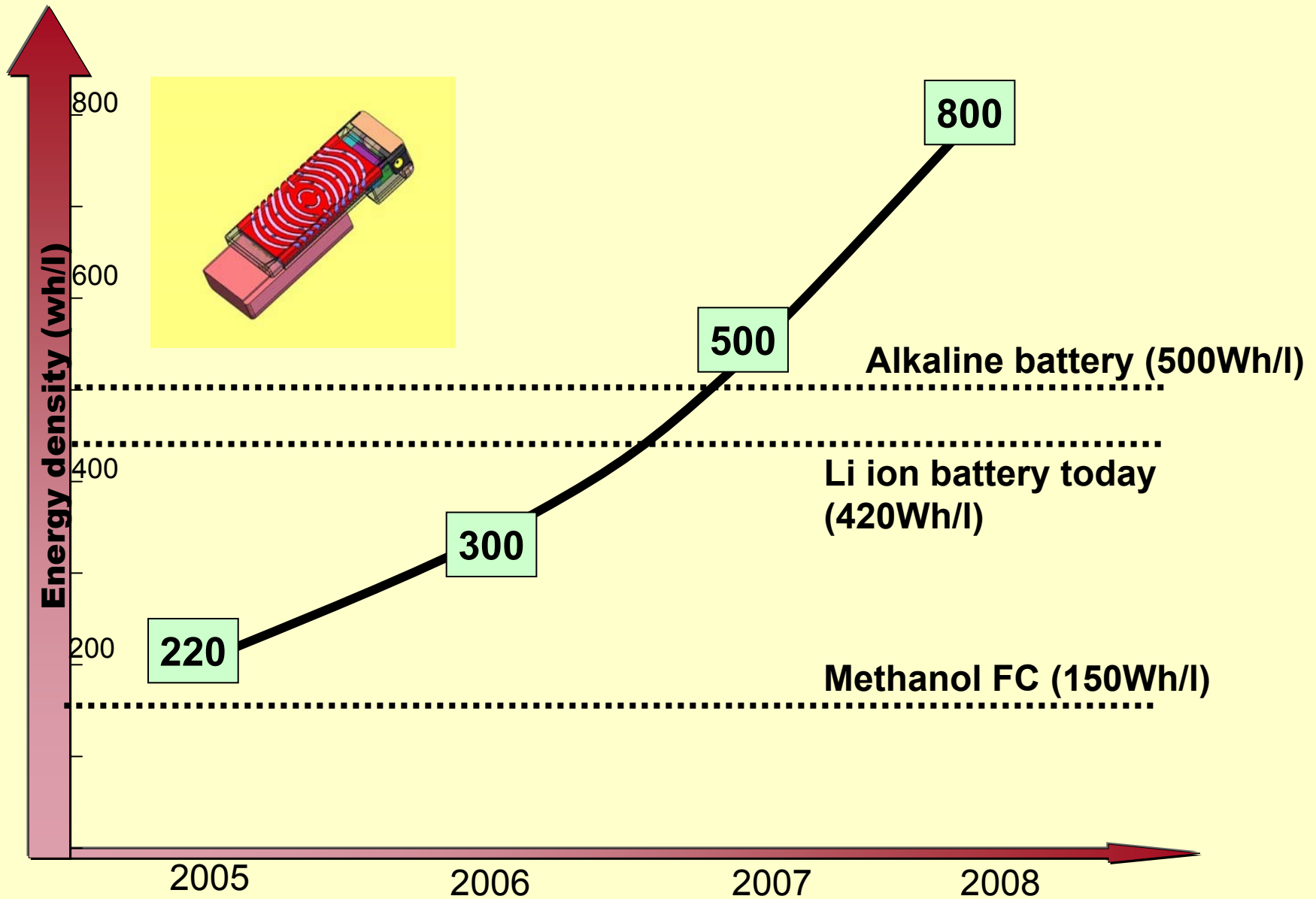
**GENEPAC** : an advanced compact  
fuel cell for the car industry



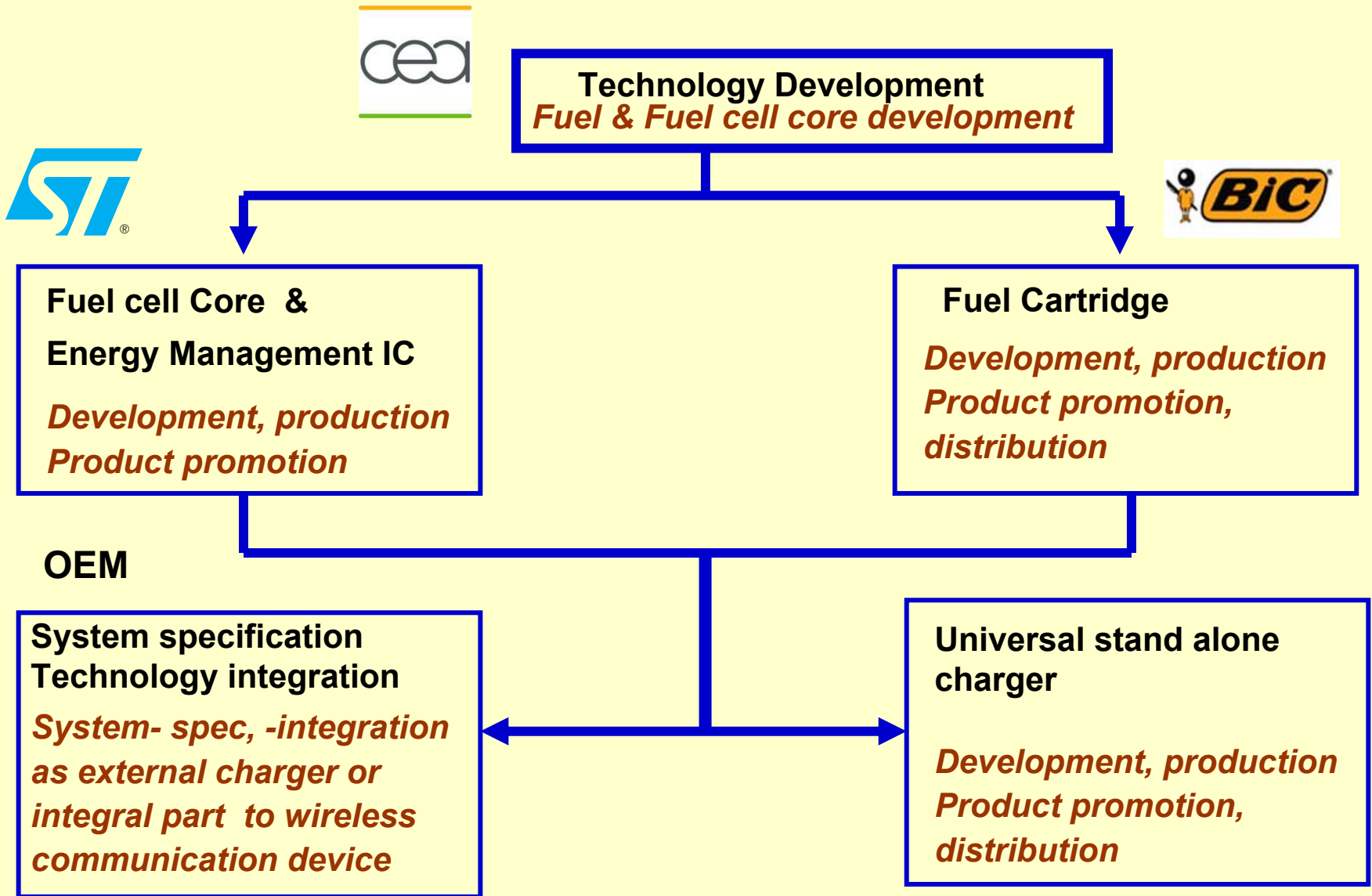
# Micro-Fuel Cell : Mobile Energy for the Future



# Energy density roadmap for 1W / 15Wh



# A Unique Research & Industrial Consortium



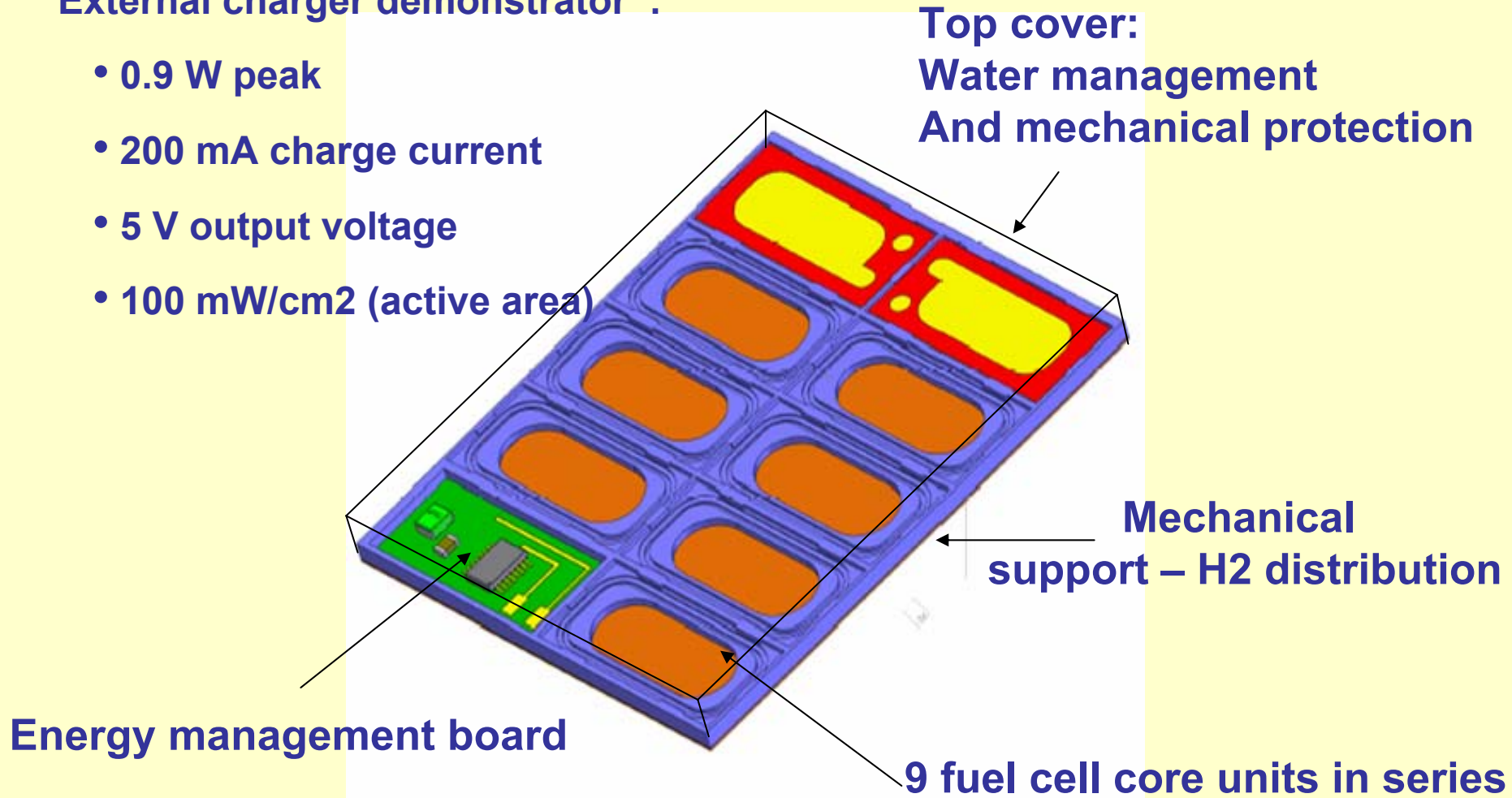




# Silicon Fuel Cell Core Unit ( FCCU)

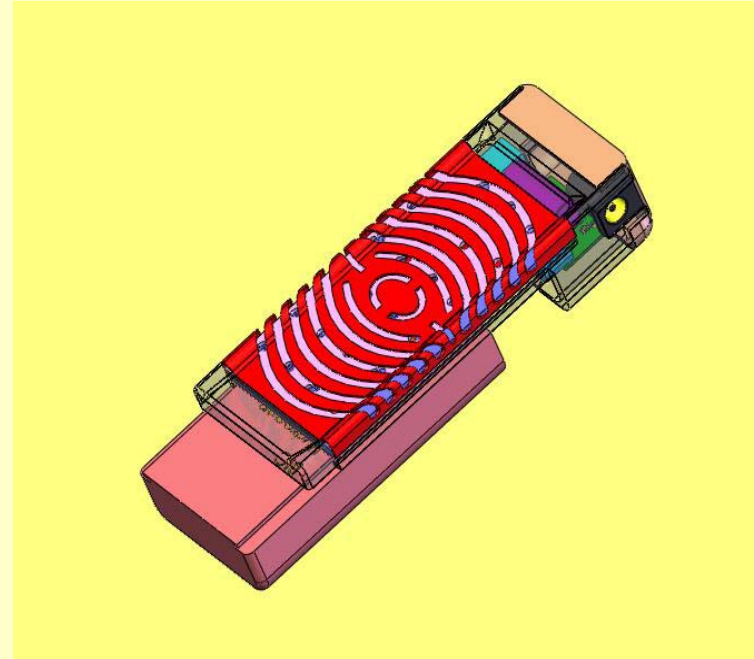
- External charger demonstrator :

- 0.9 W peak
- 200 mA charge current
- 5 V output voltage
- 100 mW/cm<sup>2</sup> (active area)



# Universal external charger

- External charger demonstrator :
  - 9 fuel cell units in series
  - 1 W
  - 200 mA charge current
  - 5V output voltage
  - 200 mW/cm<sup>2</sup> (active area)
  - cartridge capacity 5 WH
  - 4.3 cm x 5.6 cm x 1.3 cm (30 cm<sup>3</sup>)



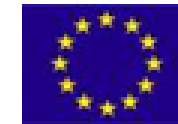
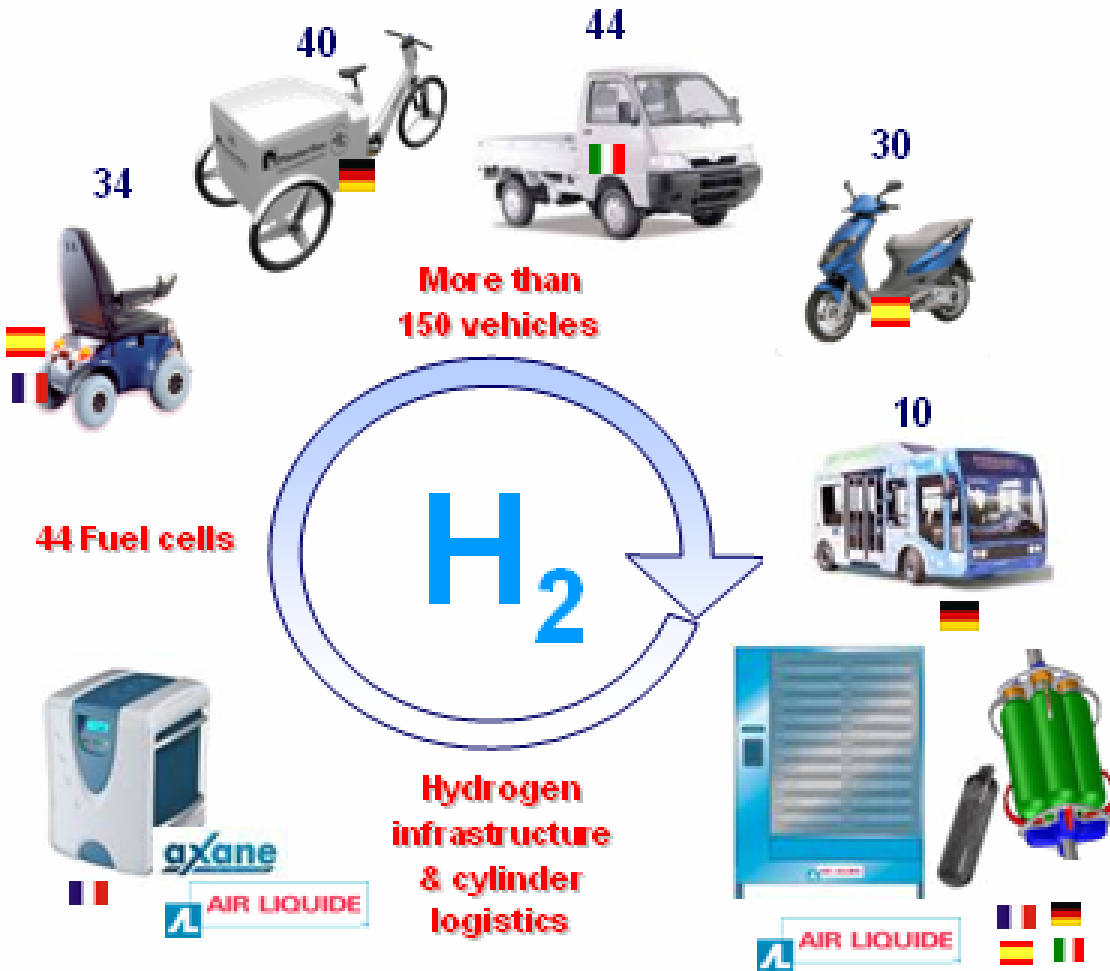
# SOME OF THE PARTICIPATIONS IN EU PROJECTS

- Hi2H2 (SOFC) with **Edf**, **DIR**
- Real SOFC with **Edf** , **FZJ**
- AUTOBRANE High Temp membrane for Car with **Edf** and **Daimler**
- HySys Fuel Cell Components with **PSA** and **Bosch**
- Storhy with **PSA**, **BMW**, **Linde** and **Air Liquide**
- HyWays
- HyICE with **IFP** and **BMW**
- EnCap and DyNamis with **IFP** and **RWE**, **Siemens**
- Demo projects with **Total** in Berlin
- Hyfleet-Cute with **Total**, **Daimler** and **Air Liquide**
- Celina Cryoplane with **UTBM**
- Felicitas with **UTBM** and **Franhauhofer Insitute**
- FEBUSS 100 kW PEMFC with **Axane** and **SGL**, **TUV**
- HyCHAIN with **Air Liquide**, **Axane** and **NRW**
- HyApproval with **Air Liquide**
- NESSHy with **Air Liquide** and **Daimler**
- HySafe with **Air Liquide**
- Road2HyCom and HyLights with **Air Liquide**
- **Etc.**

# Deployment of hydrogen small vehicle fleets : first step towards a clean transportation



Jan 2006 - Dec 2010



FP 6 - 2004 TREN.

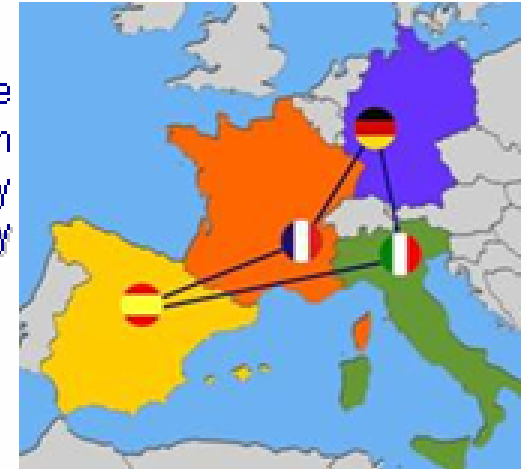
**Budget**  
40 Million €

**26 partners**

**Coordinated by Air Liquide**

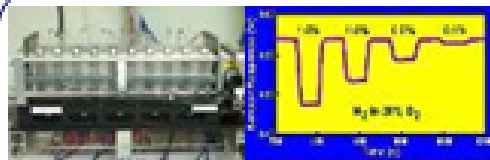
**4 European regions for deployment :**

France  
Spain  
Germany  
Italy





## Chicago, USA



**CRC** : H<sub>2</sub> impurities / fuel cell, H<sub>2</sub> sensors, CO<sub>2</sub> mitigation ...

## Newport, USA



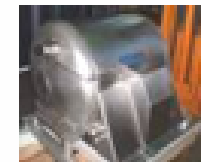
**MEDAL** : membranes, fuel cell tests

## Les Mureaux, France



**Cryospace** : cryogenic tanks, space propulsion

## Krefeld, Germany



**ALTEC** : Cryogenics

## St Ouen l'Aumône, France

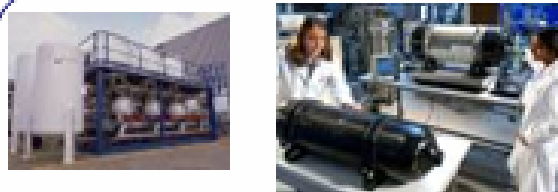


**CTAS** : Cylinder Packaging

## Tsukuba, Japan

## Sassenage, France

## Jouy en Josas, France



**CRCD** : H<sub>2</sub>-CO production, separation advanced storage, fuel cell tests, ...

## Blanc-Mesnil, France

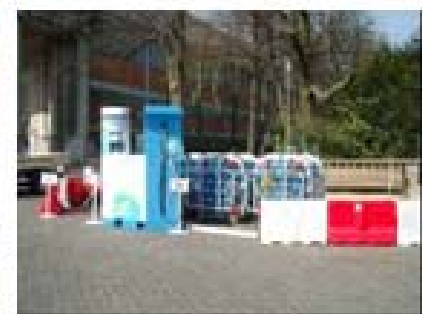
**CTE** : Cylinder testing and Materials characterization



**DTA** : Cryogenics & gas refuelling stations



**axane** : Fuel cell systems



Station	Pilot Plant in France	Madrid (CUTE)	Kawasaki (FCHV)	Luxembourg (CUTE)	Mobile Shanghai	Singapore (BP)
Start-up	January 2003	May 2003	August 2003	October 2003	October 2004	September 2005
Mode of Supply	Cylinders	SMR + Tube Trailers	Methanol Reformer	Tube Trailers	Tube Trailer	Electrolyzer

# 16<sup>th</sup> World Hydrogen Energy Conference

16<sup>ème</sup> Conférence Mondiale de l'Hydrogène Energie





***Rallying together towards  
sustainable mobility***

***7th Challenge Bibendum Paris, June 8 - 12 2006***





# Challenge Bibendum

- ❑ ***Challenge Bibendum is the Number One international event on sustainable road mobility gathering:***
    - ❑ ***Business & Industry (car manufacturers, car suppliers, energy suppliers,...),***
    - ❑ ***International and National Political institutions,***
    - ❑ ***Scientific community,***
    - ❑ ***NGO's***
    - ❑ ***and Media***
- (in total, more than 2000 attendees)***

# Bibendum Challenge Partners

**BALLARD**



**VOLVO**  
for life



**TOYOTA**

**HONDA**  
The Power of Dreams



**BOSCH**

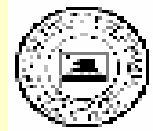


*Linde*

**ChevronTexaco**



# Bibendum Challenge Partners



# Bibendum Challenge Partners



# ***Welcome to France***

