



The Fuel Cells and Hydrogen Joint Undertaking

Bernard Frois, Chair
Member States Representatives Group



The Strategic Energy Technology Plan

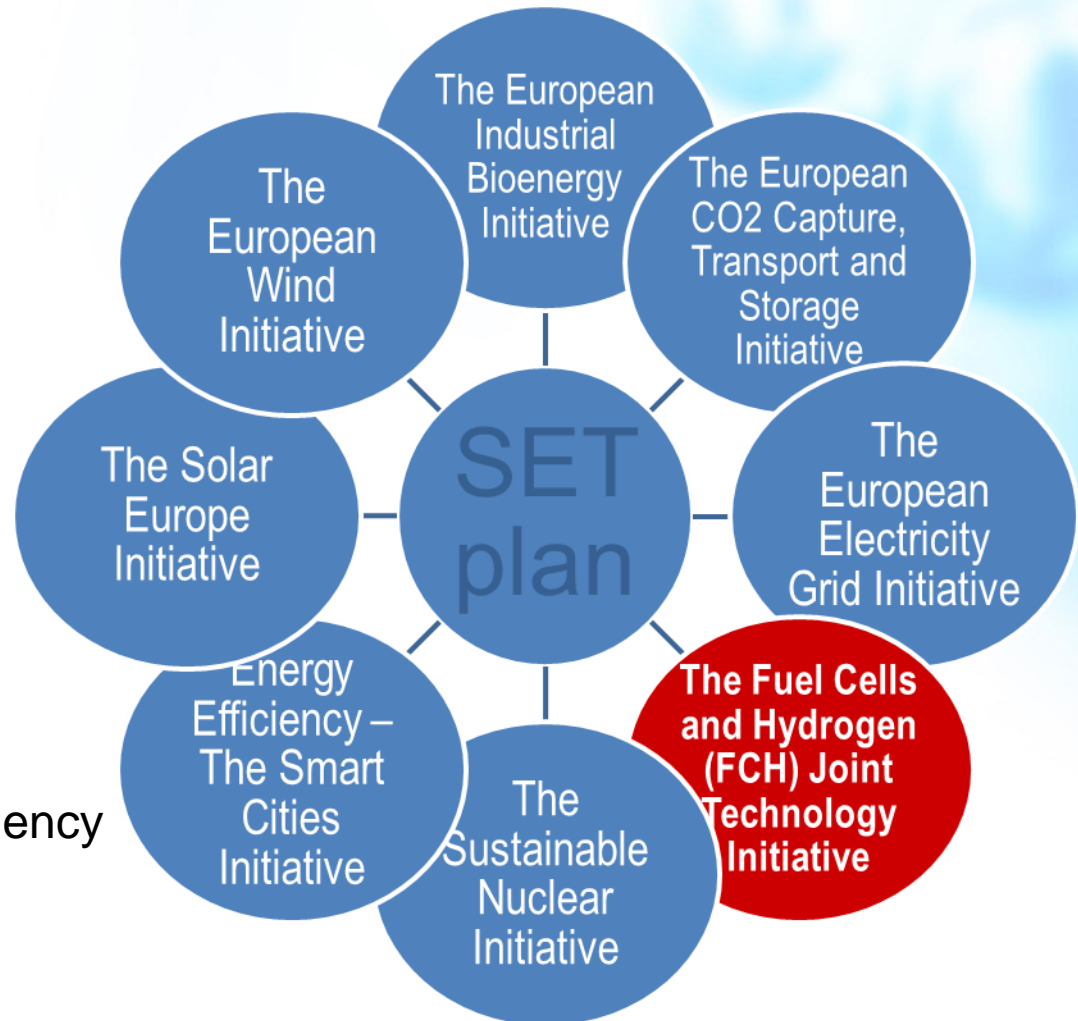
2020:

- **20%** increase in renewables
- **20%** increase in efficiency
- **20%** decrease in GHG emissions

To

The EU targets by 2030*

- **27%** renewable energy
- **27%** improvement of energy efficiency
- **40%** reduction in GHG emissions



FCH-JU: a Public Private Partnership



**Industry Grouping
NEW-IG**
80 members



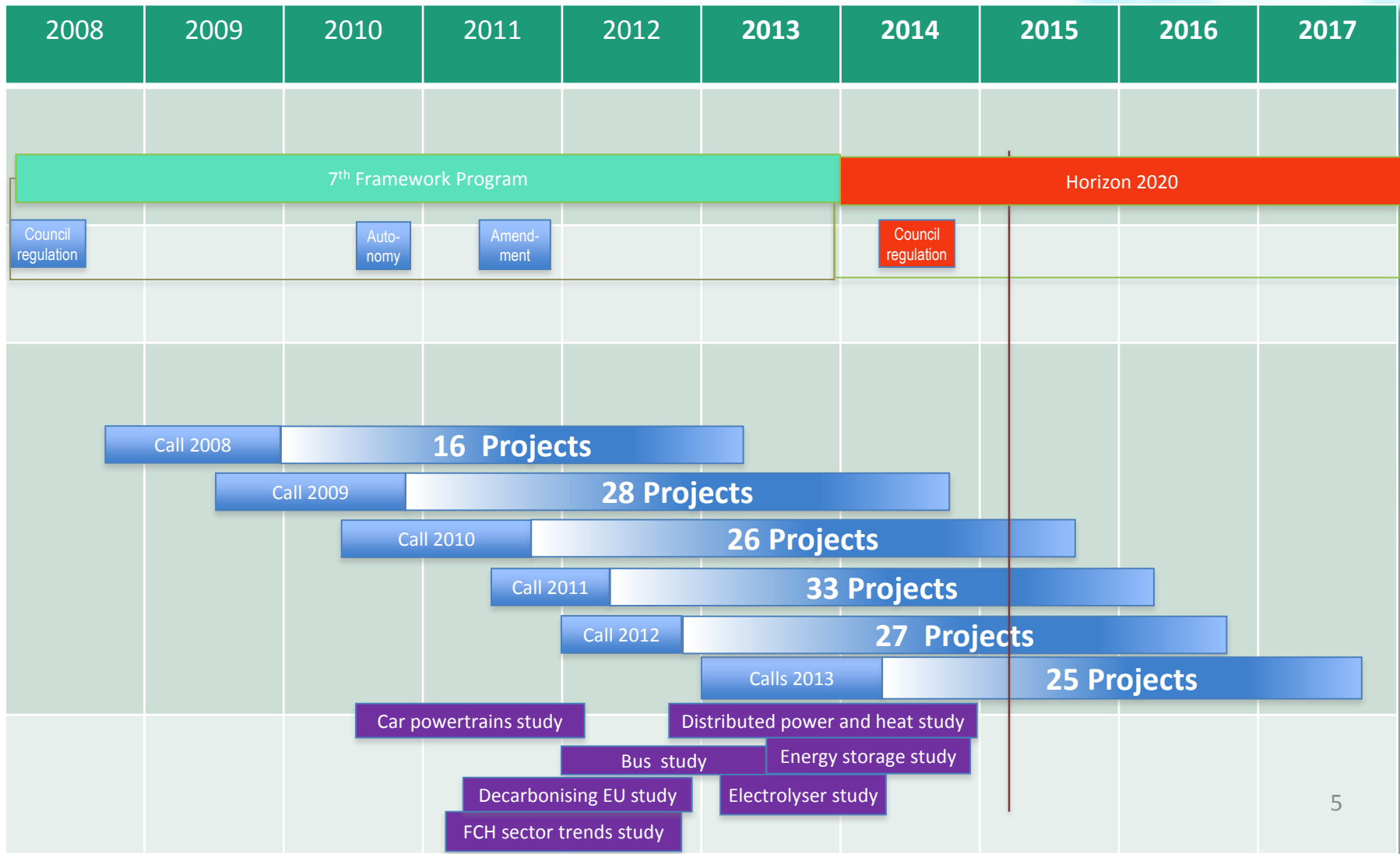
European Union
represented by the
European Commission



research on fuel cells & hydrogen
**Research Grouping
N.ERGHY**
59 members



155 Projects and 7 Studies under FP7



Calls for proposals 2014-2015

- **2014 Call:**
 - closed on 6 November 2014
 - 57 proposals received
 - 23 proposals above thresholds
 - 15 proposals proposed to be funded
 - FCH 2 JU contribution: about 82 M€ (32,7 M€ for Research & Innovation Actions)
- **2015 Call:**
 - topics under finalisation
 - Opening of the call: first week of May 2015
 - Closure of the call: last week of August 2015
 - Evaluation of the call: September 2015
 - FCH 2 JU contribution: about 125 M€ (45 M€ for Research & Innovation Actions)
- **2016 Call:**
 - Opening of the call: January 2016
 - Closure of the call: May 2016
 - FCH 2 JU contribution: about 100 M€ (40 M€ for Research and Innovation Actions)



H2MOVES

19 cars / 1 station

HYTEC

40 cars / 2 stations

SWARM

90 cars / 3 stations

HyFIVE

110 cars / 5 stations



2010

2013

2016



Increased fleets

Extended infrastructure

Reduction in vehicle cost



CHIC

HIGH V.LO-CITY

HYTRANSIT

3EMOTION



26 buses / 5 stations

14 buses / 2 stations

6 buses / 1 station

21(+6) buses / 5 stations



2010

2013

2016

Reduction in fuel consumption

Geographical expansion

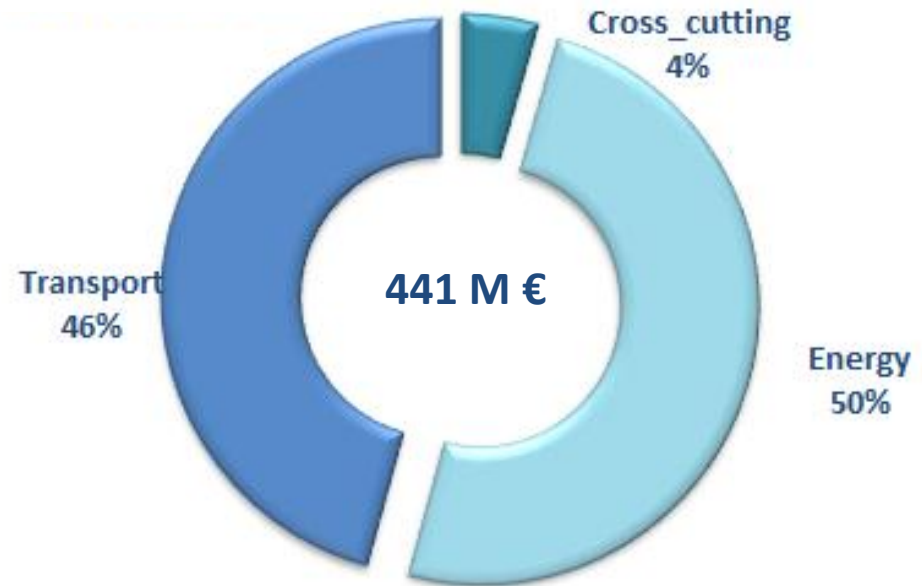
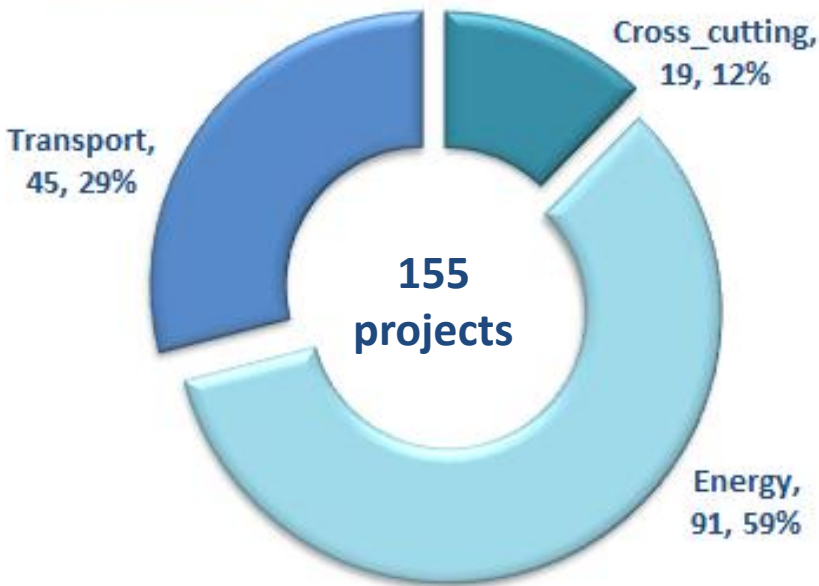
Reduction in vehicle cost



FCH JU funding in FP7 - overview by application area

By number of projects

By FCH JU contribution (M€)

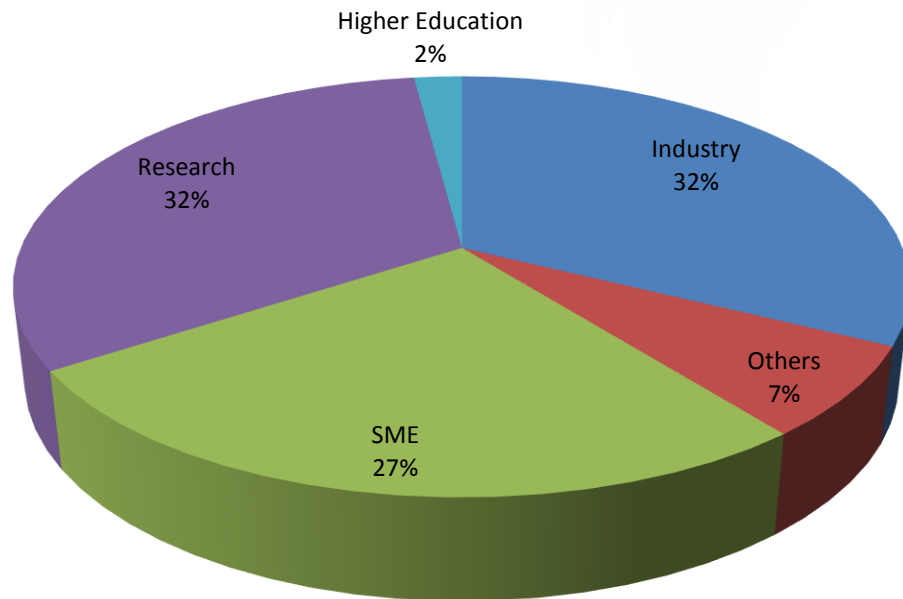


Mature European FCH strategy:

- Strong, visible and coherent
- Consensus strategy (through the multi-annual and annual work-programmes)
- Pre-competitive collaboration

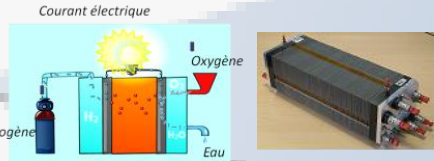
a strong FCH community in Europe

Funding of beneficiaries categories



- **1266** Participants
- **545** Beneficiaries:
 - **192** Industries (35%)
 - **154** SMEs (28%)
 - **149** Research Organizations (27%)
 - **20** High Education Institutions (4%)
 - **30** Others (6%)

Achievements - Usages



Marine & aerospace



Forklifts



Hybrid FC Buses



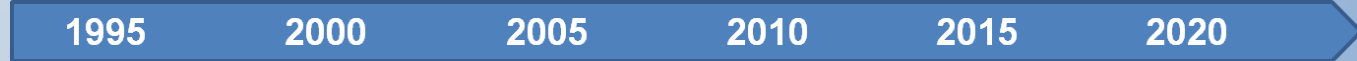
FCEV RE



FCEV



FC in commercial planes



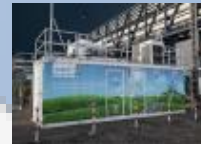
Backup power



Large scale stationary applications



Energy storage



CHP Systems



Portable applications

➔ The scope of applications is widening with time

56 Fuel cell buses manufactured by 6 different bus OEMs in 9 different cities



London - 8 Wrightbus



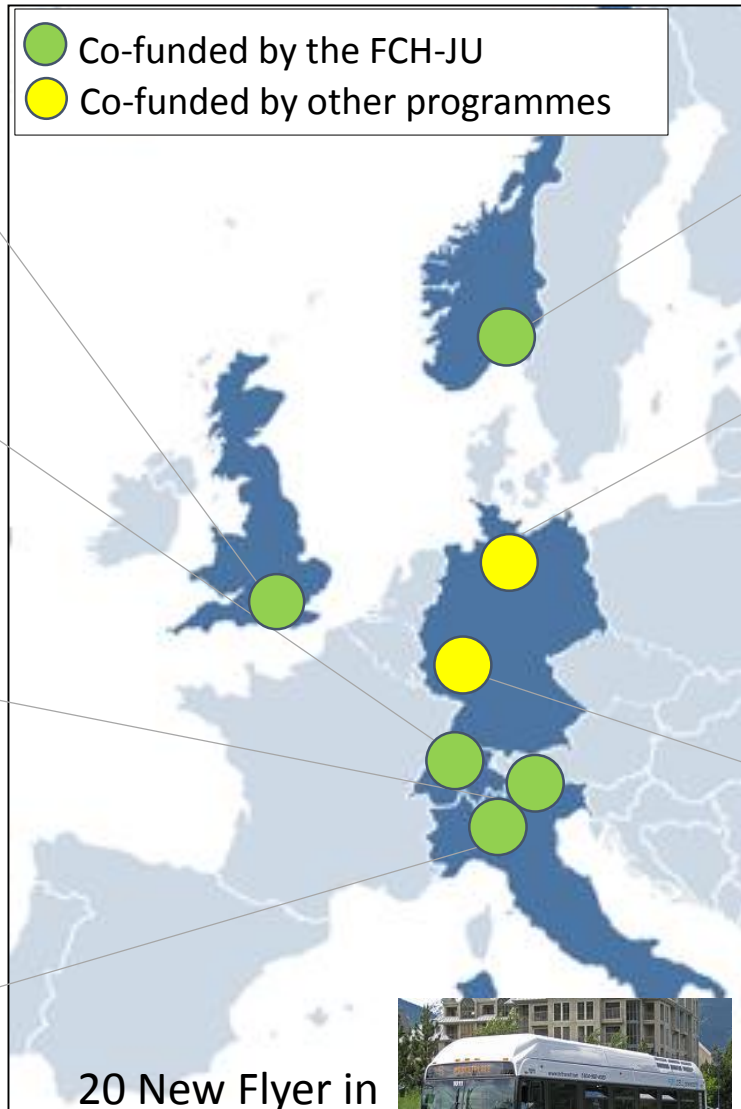
Aarau - 5 EvoBus



Bolzano - 5 EvoBus



Milan - 3 EvoBus



Oslo - 5 Van Hool



2 Solaris

Hamburg



4 EvoBus



2 APTS/
Phileas
Cologne



2 Van Hool



20 New Flyer in
Whistler

Two key activity pillars

TRANSPORT

- Road vehicles
- Non-road mobile vehicles and machinery
- Refuelling infrastructure
- Maritime, rail and aviation applications

ENERGY

- Fuel cells for power and combined heat & power generation
- Hydrogen production and distribution
- Hydrogen for renewable energy generation (incl. blending in natural gas grid)

CROSS-CUTTING ISSUES

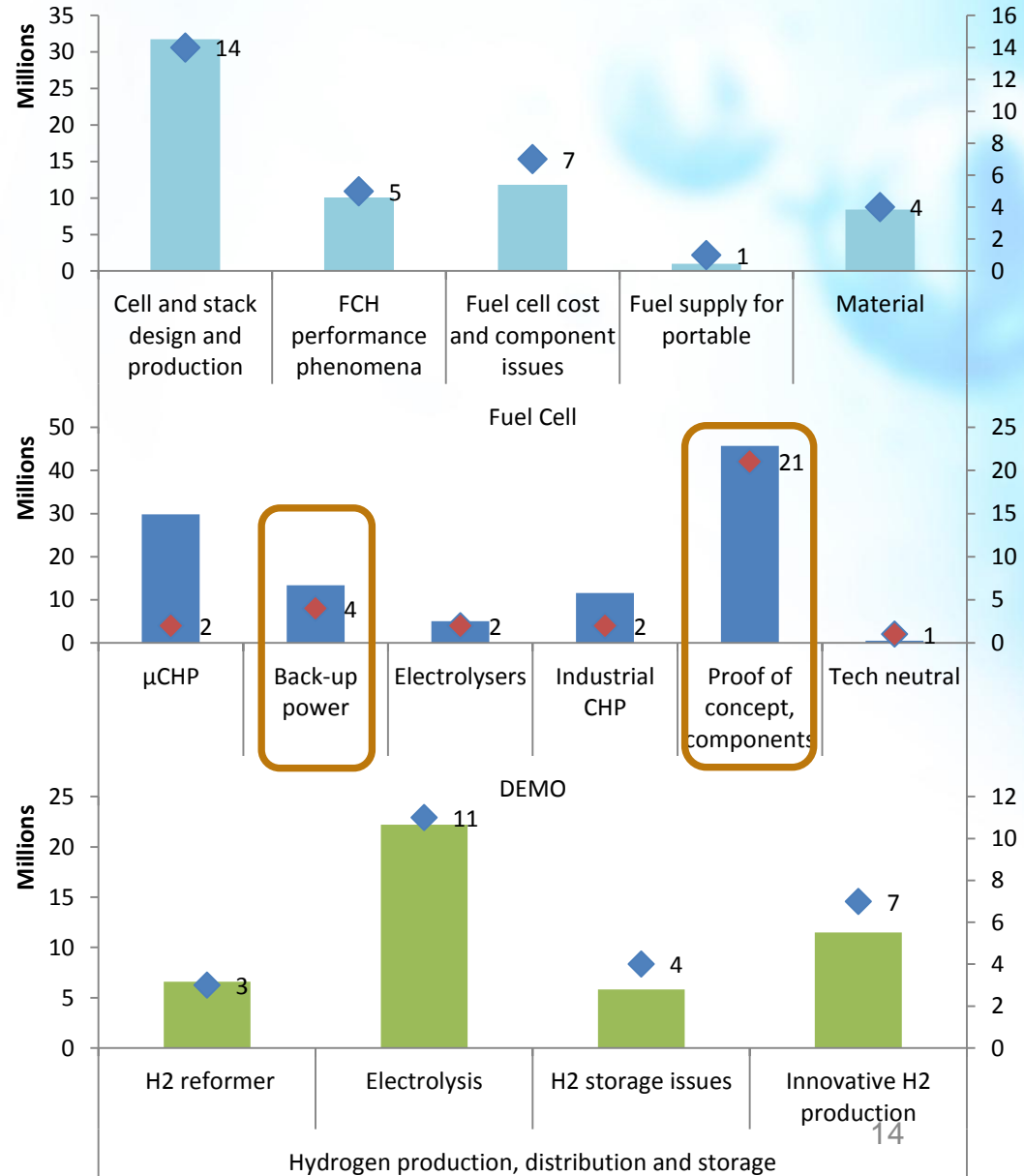
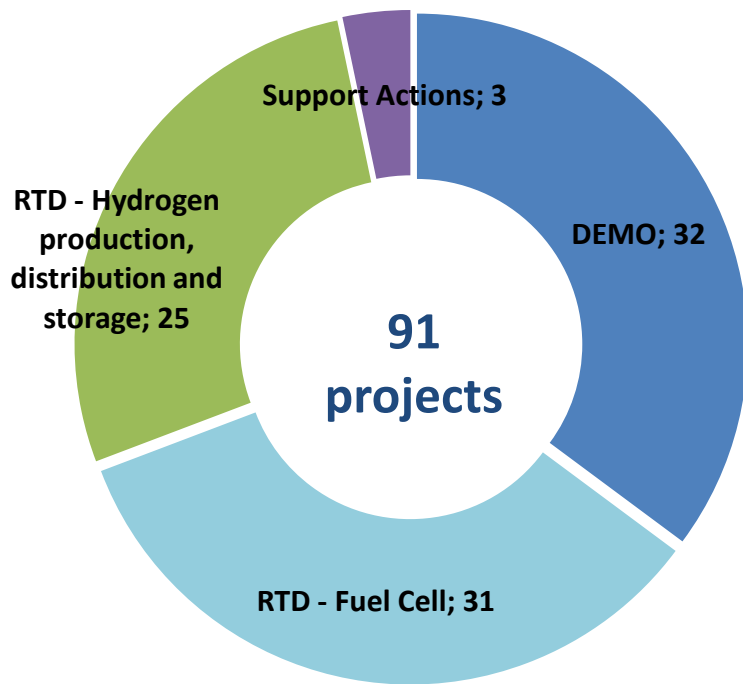
(e.g. standards, consumer awareness, manufacturing methods, studies)

Budget of €1.33 billion in 2014 - 2020

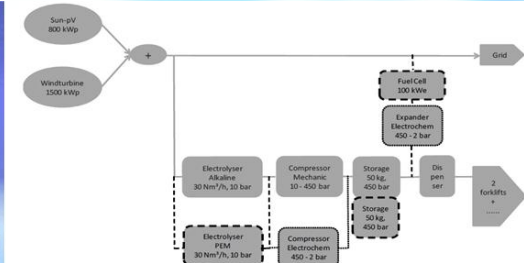
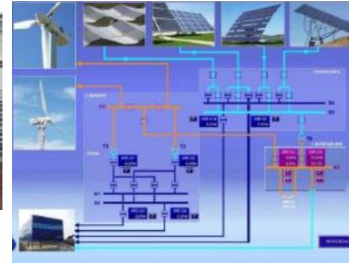
Strong industry commitment to contribute inside the programme + through additional investment outside, supporting joint objectives.

- Implementation mainly through calls for proposals or procurement studies
- More demonstration and market uptake (60% of FCH JU contribution)
- In-kind contributions only from members (or constituent entities)
- At least 3 Member States involved in a project (except support actions)
- Increased Cooperation with National and Regional Initiatives

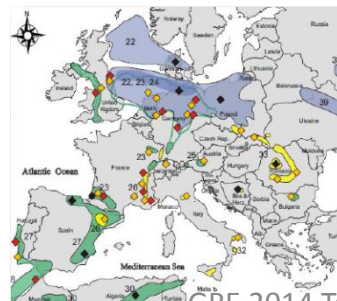
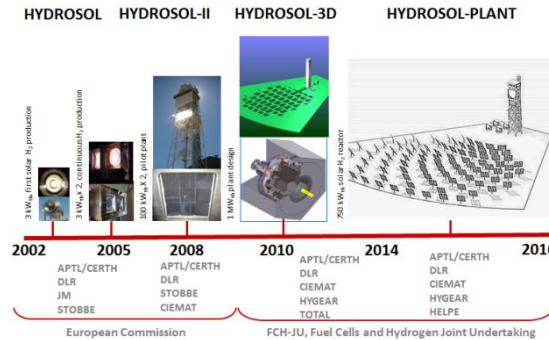
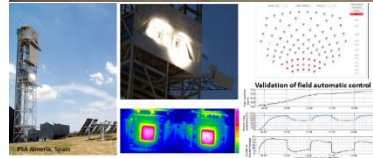
Energy projects by project type



Example of projects on renewable energies (electrolyzers – storage)



- Demonstration of high power electrolyzers coupled to renewable energy sources
- Demonstration of integrated systems
- Demonstration of hydrogen production through concentrated solar energy
- Hydrogen Underground storage



Storage potential in salt formations



Storage potential in depleted gas fields and Aquifers





Some achievements:

- **19 back-up and UPS units - 3-12kW range, installed in 3 countries**
- **On a horizon of 12 years TCO of the deployed FC UPS has a lower cost than both diesel and battery UPSs**
- **Lifetime of components: 20,000h, consistent with one maintenance cycle in 10-year life of back-up system**
- **Contribute to a Back-up power FC system cost of €1,500/kW (MAIP objective)**
- **Market analysis for telecoms back-up systems**

Back-up power and UPS projects in FCH JU - proj. examples



Fuel cell field test demonstration of economic and environmental viability of portable generators, back-up and UPS power system applications



Fluid management component improvement for back-up fuel cell systems



Development of a cost-competitive, energy-efficient and durable integrated PEM-based power system operating on low-grade bioethanol back-up and off-grid generation



Fuel-cell system for back-up-power and telecom applications

FCH JU official website:
www.fch.europa.eu



European Industry Grouping
(NEW-IG):
<http://www.new-ig.eu/>



European Research Grouping
(N.ERGHY):
<http://www.nerghy.eu/>

