



State of the Industry, way forward

FCHJU Stakeholder Forum
November 12, 2014
PE Franc, Chair New-IG



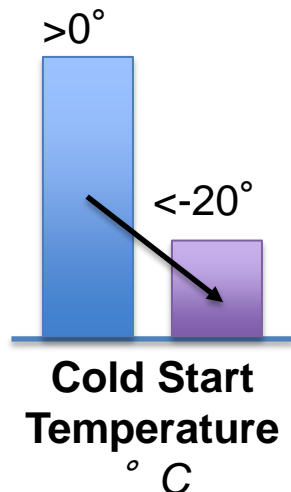
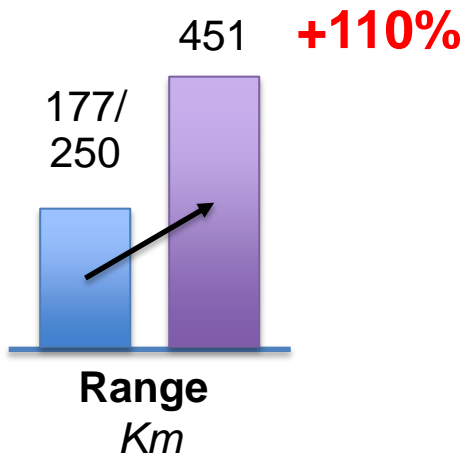
www.fch-ju.eu

- Remember what we have achieved
- Horizon 2020 : Support and Commitment
- Beyond 2020 : Imagine what could be done
- Policy needs

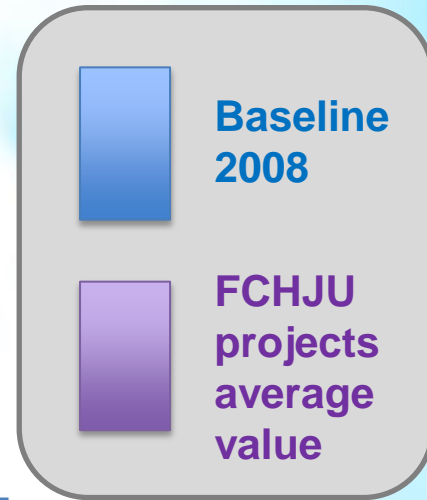
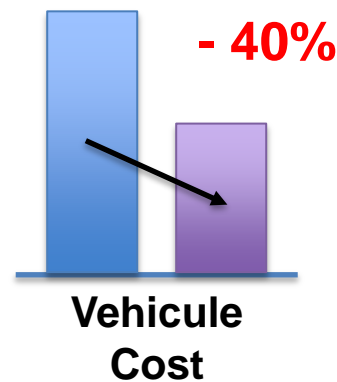
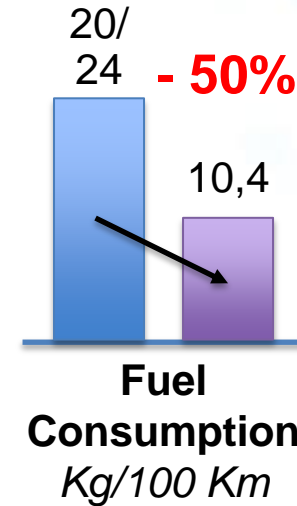
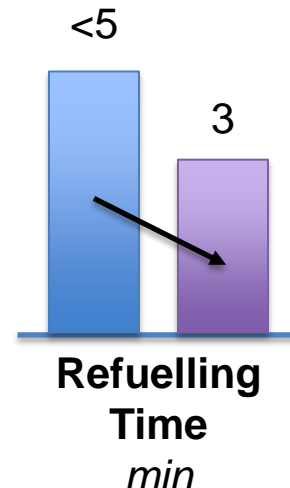
Achievements - Technology

- Transport pillar :

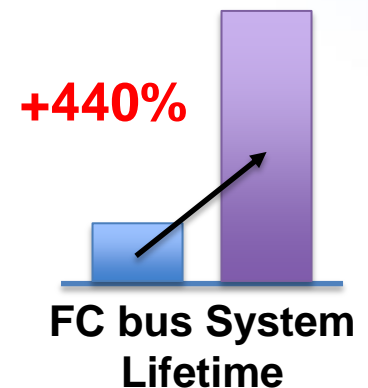
CARS



HRS-CARS

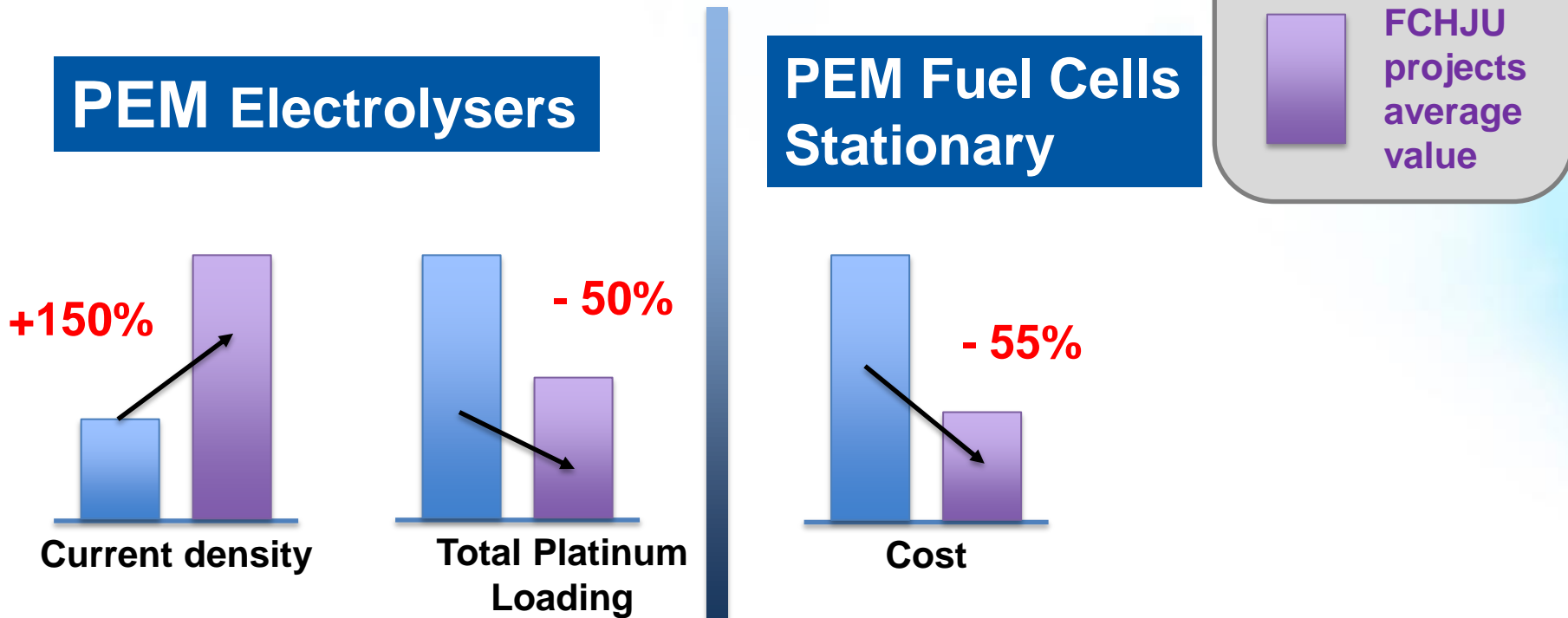


BUSES



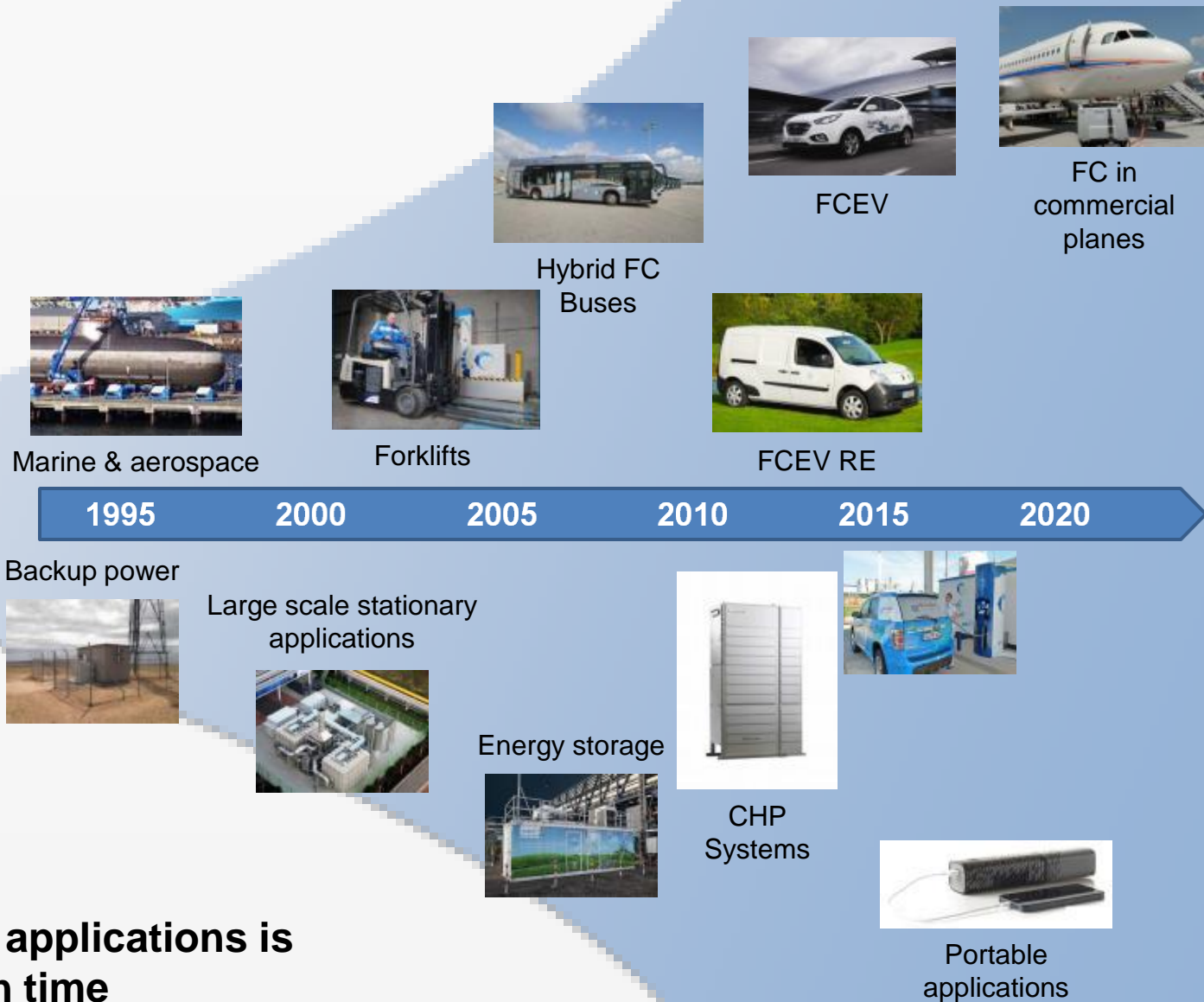
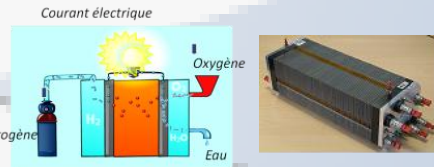
Achievements - Technology

- Energy pillar :



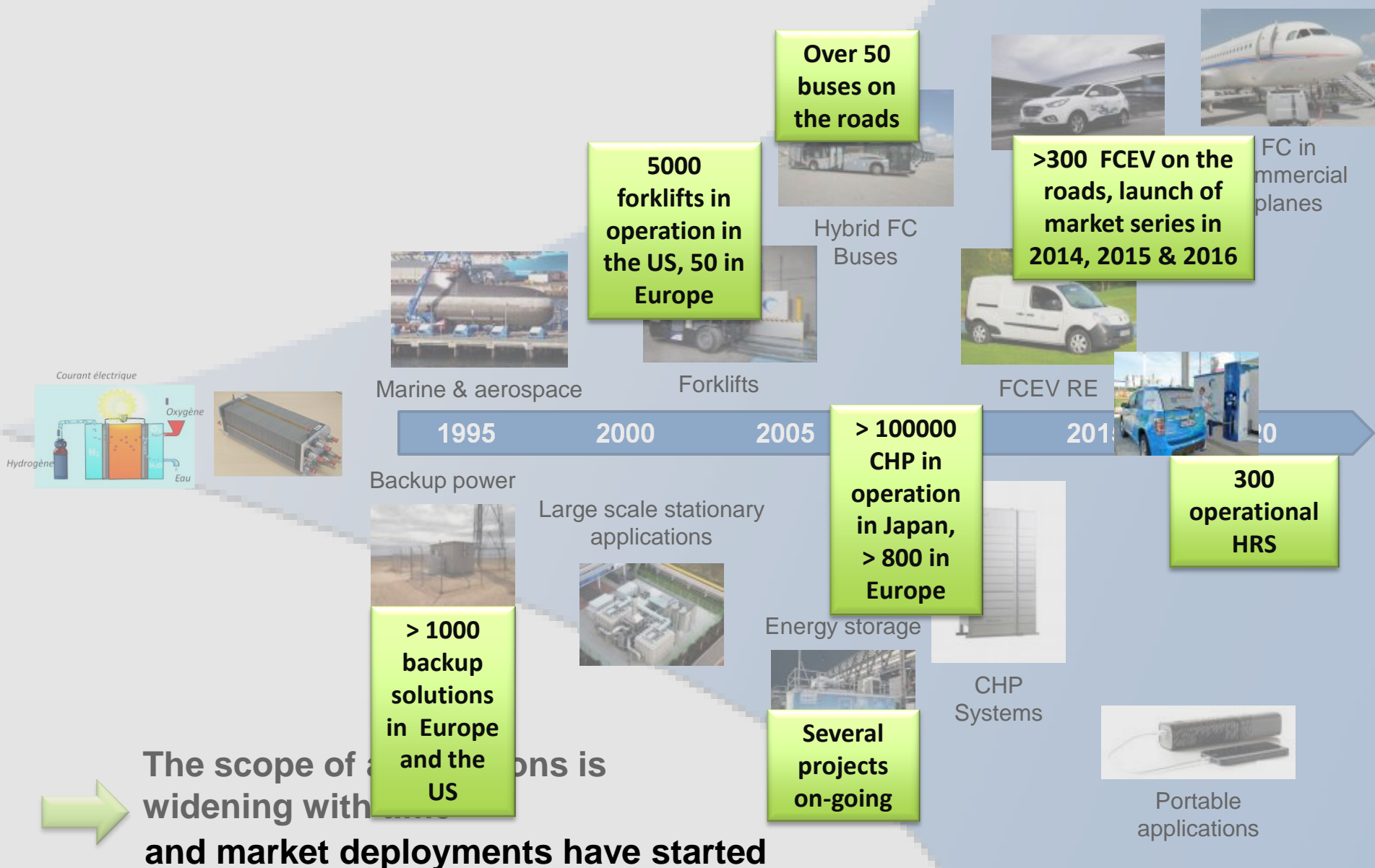
Techno Hurdles lifted ... opening ways for new limits

Achievements - Usages

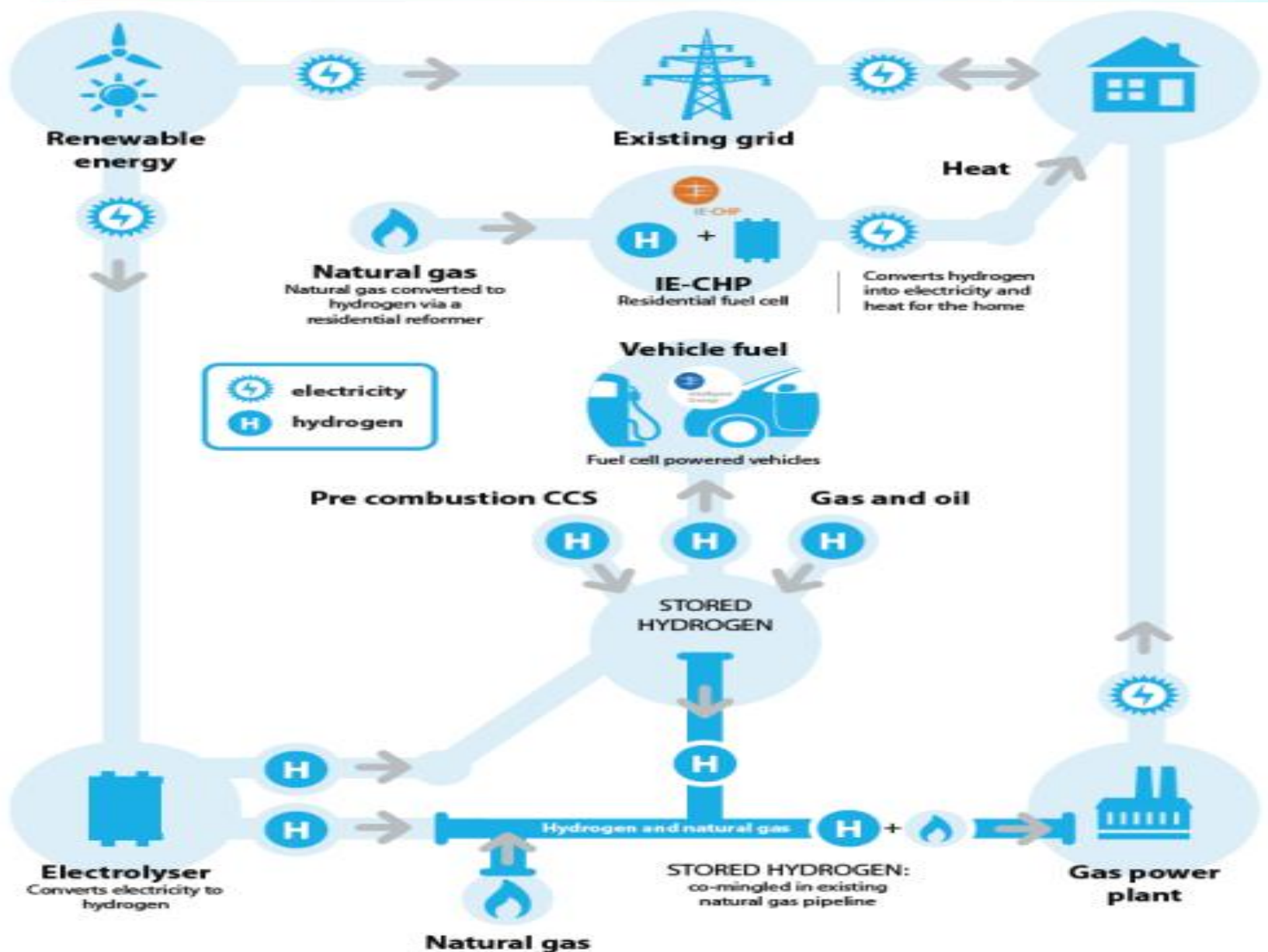


The scope of applications is widening with time

Achievements - Markets



Moving from an application to a system vision



Technologies ready to be adopted by society



**Technology
safe, but not
adapted**

**Technology is
ready**

**Technology is
dangerous**



The issue is now to get society ready as well

Horizon 2020 - We are supported

“50 hydrogen filling stations for Germany: Federal Ministry of Transportation and industrial partners build nationwide network of filling stations”

Berlin, 20/06/2012



Directive 2014/94/EU Clean fuels for transport directive adopted by the council.

Brussels, 22/10/2014



“To accelerate market entry of Fuel Cells and Hydrogen technologies, the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU) goes ahead with 1,33 B€.”

Brussels, 06/05/14



“the Business Minister Matthew Hancock announced up to £11 million of funding. Government and industry will prepare the UK for the roll-out of hydrogen fuel cell electric vehicles (FCEVs).”

UK, 09/10/14



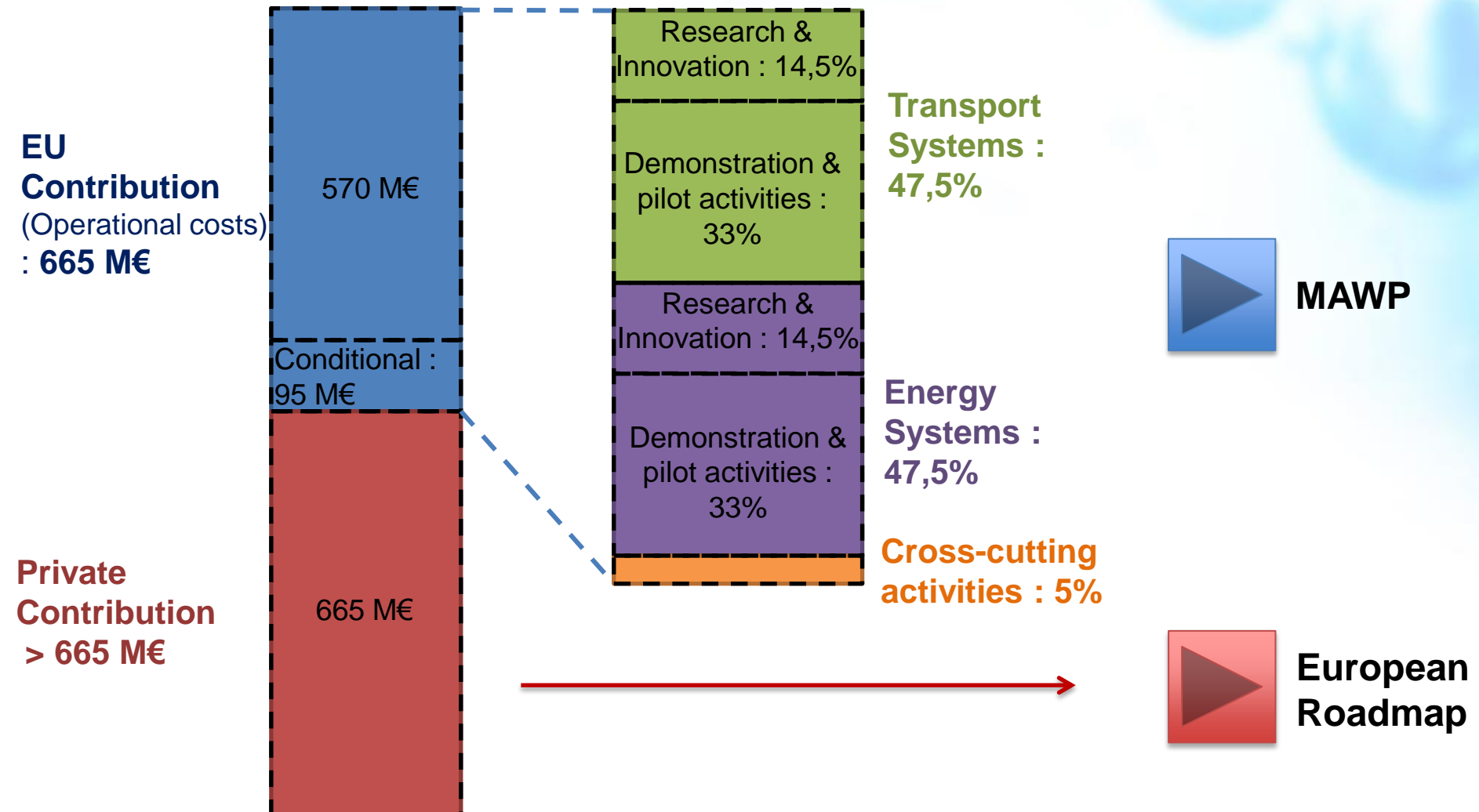
“The European Commission has [...] invited Member States to propose projects to use €11.9 billion of EU funding to improve European transport connections. This is the largest ever single amount of EU funding earmarked for transport infrastructure.”

Brussels, 11/09/2014



FCH JU II – Shared Commitments

- FCH2 JU overall investments : 1,33 Bn€



Imagine – Beyond 2020....

According to the European Climate Foundation, if European fleet moves to a fleet of advanced hybrid, battery electric and FC vehicles (80% of the fleet in 2030, 100% in 2050), impacts on fuel imports, employment and air quality could be significant :

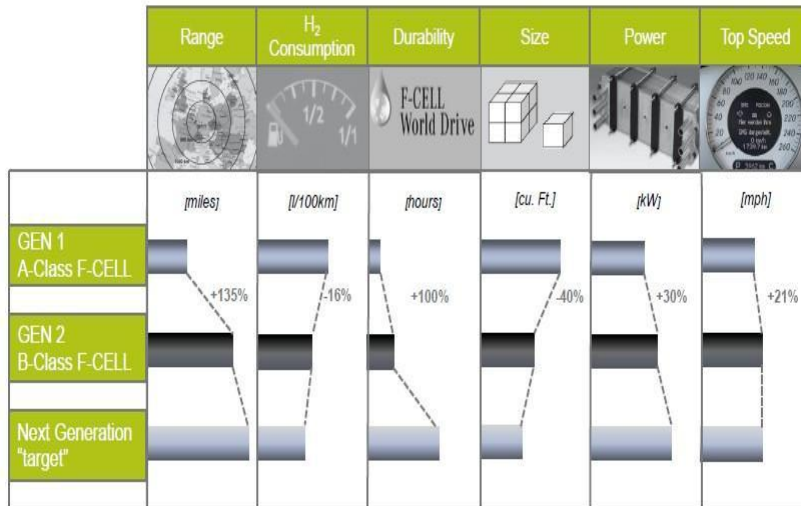
	No further improvement scenario (CO2 emissions : 135g/km)	Current Policy initiatives scenario (CO2 emissions target : 95g/km)	Rapid introduction of advanced EV (FCEV/BEV/PHEV) (15/20/45 % of fleet in 2030)
EU fuel bill in 2030	203 Bn€	162 Bn€	136 Bn€
Direct tailpipe GHG emissions in 2050	612 Mt	377 Mt	100 Mt
Direct particulate emissions in 2050	53,2 kt	32,4 kt	3,6 kt
EU job creations in 2030		0,5 M net add creations	1,1 M net add creations

Source: « Fueling Europe's Future » study, European Climate Foundation, 2013

<http://www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/FuellingEuropesFuture.aspx>

Technology and markets can still deliver

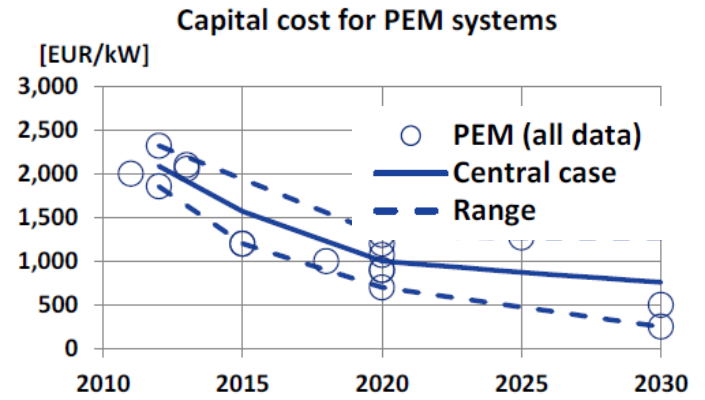
Technical Advancements of Daimler's Fuel Cell Vehicles



From generation to generation great technical improvements in numerous technical areas.

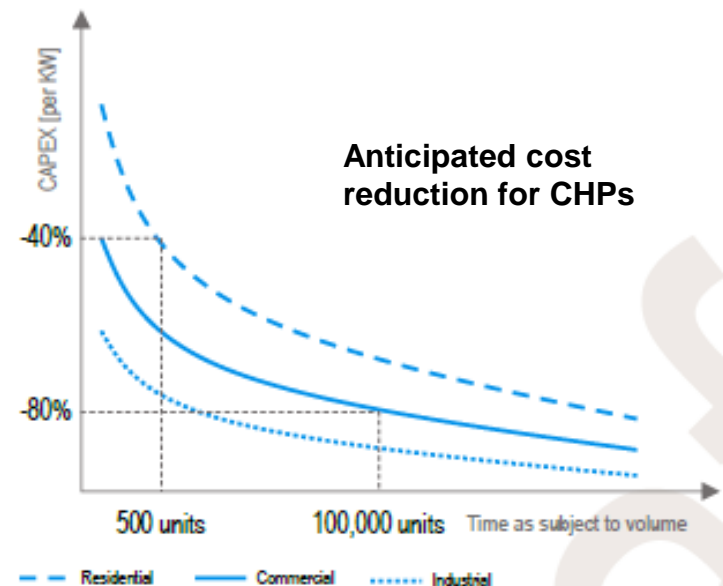
Source : Daimler

Source : Advancing Europe's energy systems:
Stationary fuel cells in distributed generation



Source : Development of Water Electrolysis in the European Union, Feb 2014

http://www.fch-ju.eu/sites/default/files/study%20electrolyser_0-Logos_0.pdf



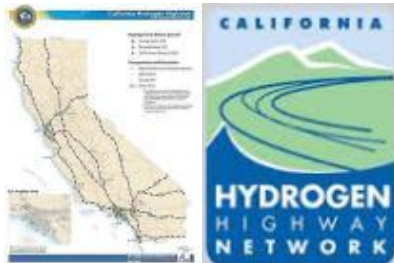
Strong Policies are Needed

Financing need: ca. 25 Bn€ by 2030

New European Union Package for Growth: 300 Bn€

REGULATIONS

Strong credits for the OEM who put zero emissions vehicles on the market

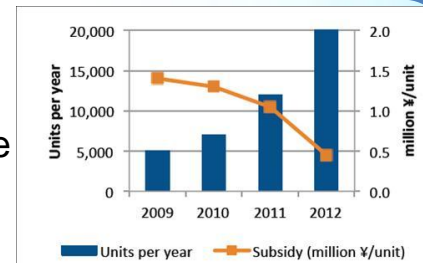


Ex of the ZEV program in California:

- CPTP
- ILUC
- FQD
- ...

FINANCING TOOLS

Subsidies from central and local government for the installation of residential CHPs



Ex of ENE-FARM program in Japan:

- Equity mechanisms
- Green bonds
- Reimbursable grant systems
- Insurance products
- ...

We will make it – Thank you all !!!

Fuel Cells & Hydrogen 2 Joint Undertaking



**Industry Grouping
NEW-IG
80 members**



**European Union
represented by the
European Commission**



**Research Grouping
N.ERGHY
59 members**



MAWP's objectives for 2020

Ex of KPI for the transportation pillar :

Category	Parameter	2012	2020
FCEV	FC Vehicle cost (C-Segment)	200 k€	50 k€
	Tank-to-wheel efficiency	40%	45%
	Availability	95%	98%
	FC system lifetime	2500h	6000h
Hydrogen Supply	Cost of renewable H2 delivered to HRS	13 €/kg	9 €/kg
	H2 refuelling stations cost	1,5-3,5 M€	0,8-2,1 M€

MAWP's objectives for 2020

Ex of KPI for the energy pillar :

Category	Parameter	2012	2020
H2 production by Electrolysis	Energy consumption (kWh/kg) @ rated power	57-60 @100kg/d	52 @1000+kg/d
	H2 production @rated power including ancillary equipments & comissioning	8,0 M€/(t/d)	2,0 M€/(t/d)
Mid-sized CHP installations for commercial and larger buildings (5 – 400 kW)	CAPEX	6 - 10 k€/kW	4,5 – 7,5 k€/kW
	LCOE	3*grid parity	2*grid parity



NEW-IG European Roadmap for deployment of FCEVs



By 2015, existing national and European demonstration projects will have deployed approximately 70 HRS across Europe

Locations of existing or planned HRS by 2015 (>80 kg/day stations)

2015

France 

By 2018 the planned pan-European project will increase the refuelling network across these nations and start to create strategic links along TEN-T corridors

a small number of HRS which will optive fleets

Likely expansion of the network by 2018 (>80 kg/day stations)

2018

From 2020, the H₂Mobility initiatives would allow nationwide driving in the first-mover countries and start to expand into neighbouring countries along TEN-T Corridors, taking learning from the early deployment centres

Likely implementation of the network by 2020 onward (>80 kg/day stations)

>2020

France 

- The French network will keep on expanding with **30-40 HRS** by 2020 and **100 HRS** by 2023

Germany 

- The German network will keep on expanding with **400 HRS** in 2023

Netherlands 

- The Dutch network will keep on expanding with **20 HRS** by 2020 and **40-50 HRS** by 2023




Scandinavia    




- The Scandinavian network will keep on expanding with **35-40 HRS** by 2020 and **50 HRS** by 2023

UK 

- The UK network will keep on expanding with **60-70 HRS** by 2020 and **100 HRS** by 2023

Key:

-  >80 kg/day HRS by 2015
-  TEN-T Corridors
-  TEN-T Corridors linked by early HRS

-  Nations with H₂Mobility initiatives
-  Nations with some activity and/or H₂Mobility initiatives starting
-  Nations without H₂Mobility initiatives

2020

- Storage roadmap : on going
- Stationary roadmap : on going