



# Fuel Cells & Hydrogen Latest developments at EU level

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*IPHE - 21<sup>th</sup> Steering Committee meeting – Oslo, Norway – 20/21 May 2014*

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1



## Contents

### 1. FCH 1 JU

- ✓ Results of 2013-2 Call for Proposals
- ✓ Main achievements to date
- ✓ Benchmark studies

### 2. FCH 2 JU in H2020

- ✓ State of play
- ✓ Events

### 3. Other EU initiatives

- ✓ Clean Power for Transport Package – update
- ✓ European Council & EU energy security
- ✓ New 2030 Climate & Energy Framework

### 4. Power to Gas


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2

# 1. FCH 1 JU - update



 <b>Projects from 2013-2 Call</b>			
Application Area	Number of Projects	Total Budget (M€)	EC contribution (M€)
1. Transportation & Refuelling Infrastructure	1	38	15
2. Hydrogen Production & Distribution	NO PROPOSALS SELECTED FOR FUNDING		
3. Stationary Power Generation & CHP	NOT CALLED		
4. Early Markets	NO PROPOSALS SELECTED FOR FUNDING		
5. Cross-Cutting issues	1	0.5	0.4
<b>TOTAL</b>	<b>2</b>	<b>38.5</b>	<b>15.5</b>


 **FCH (1) JU – global overview\***

- ✓ 153 projects financed
- ✓ 540 participants from 33 countries:
  - 300+ enterprises
    - of which almost 50% SMEs
  - 70+ research institutes
  - 90+ universities
- ✓ EU contribution to the FCH (1) JU ~ 470 M €
- ✓ Special role for EC Joint Research Centre (PNR, RCS...)
- ✓ Includes international cooperation outside EU

\* Provisional figures pending finalisation of the negotiations of the 2013 calls

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5

 **Main achievements of FCH (1) JU**

**Transport:**



- Demonstration of 49 buses, 37 passenger cars, 95 mini cars
- Bus H2 consumption halved
- 13 new refuelling stations in EU
- H2 cost <10€/kg

**Stationary Power:**


- 1000 domestic CHP generators being installed
- Cost -50%, efficiency 90%, lifetime up to 8 years


**Early markets:**

- 9 fork lifts, 1 tow truck demonstrated
- 19 back up power units installed






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 <b>Benchmark studies</b>		
TOPIC	Budget €	Status
"The development of the <b>electrolysis in the EU</b> and its role in using <b>H2</b> as a mechanism for <b>energy storage</b> "	113.848	Finished and available on FCH JU website
"Financing of a <b>Hydrogen Refuelling Infrastructure</b> : conditions for private investments and required forms of public support"	390.200	Finished and available on FCH JU website
"The role of fuel cells in distributed power generation"	~1.100.000	Ongoing
"A fact based comparison of technologies for energy storage"	~1.100.000	Starting soon
"Development of a European Urban Fuel Cell Bus Commercialisation Strategy"	~1.200.000	Starting soon



## 2. FCH 2 JU in H2020 – State of play




8


 **What is Horizon 2020?**

- Biggest ever European R & I Programme for 2014-2020
- Budget of nearly 80 billion €
- Aiming at:
  - ✓ **boosting investment in growth & jobs**
  - ✓ **addressing people's concerns about living conditions**
  - ✓ **strengthening EU's global position in research, innovation & technology**
- International participation a key element  
 ([http://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/Factsheet\\_international\\_participation.pdf](http://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/Factsheet_international_participation.pdf))




9

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 **FCH 2 JU in Horizon 2020 (1)**

- Continuation of FCH (1) JU proposed under H2020
- Part of the Innovation Investment Package, worth € 22 B
- To cover activities of value close to € 1.3 B
- Adoption by the Council in May 2014
- Launching Event on 9<sup>th</sup> July 2014
  - with publication of 1<sup>st</sup> Call for Proposals (budget ~ € 94 M)



10

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## FCH 2 JU in Horizon 2020 (2)

### New features:

- ✓ 2 main areas of activity: "Energy" & "Transport"
- ✓ More emphasis on close to market activities
- ✓ Main priorities: H2 based renewable energy storage + road transport & infrastructure
- ✓ Resource scarcity receives more attention
- ✓ EU contribution up from 470M€ to 665M€\*

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11



## Events

### 2014 Stakeholders Forum

- ✓ When? Provisionally on 12<sup>th</sup> November 2014
- ✓ Where? Brussels, Belgium
- ✓ How? New organisational formula to increase impact
- ✓ Open to public!

More info soon on:

<http://www.fch-ju.eu/>



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12

### 3. Other EU initiatives



### "Clean Power for Transport" Package (1): RATIONALE

- Sets out alternative fuels strategy for long-term substitution of oil in transport
- Main objectives:
  - ✓ creating certainty for investors
  - ✓ removing technical and regulatory barriers across the EU

→ To enable mobility based on alternative fuels Europe-wide



 **"Clean Power for Transport" Package (2):  
REQUIREMENTS**

The amended directive:

- Requires Member States to develop national policy frameworks for build-up of alternative fuels and their infrastructure;
- Foresees the use of common technical specifications for recharging and refuelling stations;
- Sets requirements for fuel labelling to ensure vehicle/fuel compatibility.

✓ Adoption by the European Council foreseen in summer 2014

 15

 **"Clean Power for Transport" Package (3):  
H2 infrastructure**


Requirements for hydrogen in national policy frameworks :

- Coverage: "appropriate number of points"
- Timeline: "by end of 2025"



 16





**"Clean Power for Transport" Package (4):  
H2 standardisation**

- For hydrogen the directive requires development of standards containing coherent and single technical interoperability specifications for:
  - outdoor **hydrogen refuelling points** dispensing gaseous hydrogen compatible with ISO/TS 20100:2008 (or its later edition)
  - **hydrogen purity** dispensed by hydrogen refuelling points compatible with ISO 14687-2:2012
  - **fuelling algorithms and equipment of hydrogen refuelling points** compatible with ISO/TS 20100:2008 or its later edition
  - **connectors for vehicles** for the refuelling of gaseous hydrogen compatible with ISO 17268:2012
- DE-US-JP-Scan-EU cooperation on pre-normative issues related to HRS
- 7/Feb/2014: Commission issued standardisation request to ESOs
- Publication deadline for the standard: 31/12/2015

17


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**European Council (20/21 March)  
conclusions (1)**

**1. Energy security**

**Efforts to reduce Europe's high energy dependency should be intensified. Major objectives include:**

- ✓ Moderating energy demand via enhanced **energy efficiency** as 1<sup>st</sup> step
- ✓ Further **diversification of energy supply** together with
- ✓ Coordinated development of **infrastructure** in support of this diversification
- ✓ Developing **renewable & indigenous energy sources**
- ✓ Enhancing Europe's bargaining power



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## European Council (20/21 March) conclusions (2)

### 2. Industrial competitiveness

Europe needs strong & competitive industrial base as key driver for economic growth & jobs. In this context special attention will be paid to:

- ✓ Promoting European & international standards & regulations
- ✓ Maximising efficiency of public investment in research
- ✓ Addressing STEM (science, technology, engineering & mathematics) skills shortages
- ✓ Tapping the potential of cleantech for enhancing EU's competitiveness

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19



## 2030 Climate and Energy Package (1)


Commission is proposing new climate & energy objectives for 2030, to:

- ✓ Reduce EU's dependence on imported fossil fuels
- ✓ Make Europe's economy more energy/resource efficient
- ✓ Boost investments, develop new technologies & create jobs
- ✓ Reduce the environmental footprint of European economy

➔ The new framework will be basis for EU position in negotiations on new international climate agreement in 2015

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20



## 2030 Climate and Energy Package (2)

**New targets for 2030:**


- ✓ GHG emission 40% lower than 1990 levels
- ✓ Renewable energy of at least 27% of energy consumption

**To be complemented by:**

- ✓ KPIs for:
  - Competitiveness of the energy system
  - Security of energy supply
- ✓ Reformed EU emission trading system as key component

**Framework to be finalised by end of October 2014**

21




## Regulation on European Standardisation

**EU to promote cooperation between European standardisation organisations and international standardisation bodies.**

➔ **Annual EU Work Programme for European standardisation:**

- ✓ To identify strategic priorities
- ✓ Taking into account
  - ✓ EU long-term growth strategies
  - ✓ Economic competitiveness
  - ✓ Societal needs


Regulation EU No 1025/2012  
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:316:0012:0033:EN:PDF>

22



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## 4. Power to Gas



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23


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## Power to Gas (P2G) (1)


- **P2G is a technology that converts electrical power to gas via electrolysis. There are two types P2G:**
  - 1) With H<sub>2</sub> as end product, which can be used in transport/industry directly or injected into natural gas grid
  - 2) Where H<sub>2</sub> is combined with CO<sub>2</sub> to form methane, which can be fed into natural gas grid
- **It is attractive because:**
  - ✓ It can use electricity from fluctuating RES (solar, wind), otherwise wasted
  - ✓ Produced gas is easily storable (whether H<sub>2</sub> or CH<sub>4</sub>) in contrast to electricity
  - ✓ When electricity shortage arises H<sub>2</sub> can be converted back into electricity (using fuel cells) to balance the grid


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24

 **Power to Gas (P2G) in FCH 2 JU**


- ✓ P2G is expected to play an important role in integrating increasing share of fluctuating RES in Europe's future energy system
- ✓ Consequently, one of priorities for FCH 2 JU
- ✓ Main focus will be on pure H<sub>2</sub> to power fuel cell applications
- ✓ Economics key for deployment!







**THANK YOU FOR YOUR ATTENTION**

 26