



Fuel Cells & Hydrogen

EU level update

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1. FCH 2 JU - update



FCH 2 JU update

- FCH 2 JU was adopted by Council in July 2014, less than a year after Commission proposal
- Maximum 665 M€ of EU funding, to be matched by equivalent amount from private sector
- First call for proposals under FCH 2 JU launched on 9 July, containing 22 topics for a total EU funding of 95 million €
 - Evaluation scheduled for December
 - Approval of evaluation results mid-Feb 2015
- Second Call for proposals to be launched in May 2015 for a tentative budget of 112 M€ EU funding, topics under discussion
- Annual Work Programme 2015 under elaboration

2014 Stakeholder Forum

- 12 November 2014, preceded by Programme Review Days
- 300 Participants, open access
- Positive atmosphere:
 - “Market is ready, give us the products”
 - "Our products are ready, please make a commitment"
- Signature of **Letter of Understanding** by 5 FC bus OEM's, presented to deputy mayor of London & First mayor of Hamburg



2. Other EU initiatives



"Alternative Fuel Infrastructure" Package (1):

- A.k.a. "Clean Power for Transport"
- 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



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"Alternative Fuel Infrastructure" Package (2): REQUIREMENTS

Directive 2014/94

- 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.

✓ **Entered into force on 17 November 2014**

European Commission has given mandate to CEN-CENELEC to develop Alternative Fuel Infrastructure standards

- 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



CEN-CENELEC eMobility Coordination Group (eM-CG) has been following AFI since 2013

2030 Framework for Climate and Energy Policies

Agreement by EU leaders on 23 October 2014:

- ✓ **Reducing greenhouse gas emissions by at least 40% below 1990 level**
- ✓ **Increasing share of renewable energy to at least 27%, binding at EU level**
- ✓ **Increasing energy efficiency by at least 27%**
(to be reviewed in 2020, aiming at 30% target)
- ✓ **Reform of EU emissions trading system**
Cap declining by 1,74% annually up to 2020, 2.2% from 2021 onwards

President Juncker's Innovation Investment Package



- New Commission entered into office in October 2014 under Presidency of Jean-Claude Juncker
- Public announcement in November of Investment Package worth >300 Billion € to revitalise European industry through investments in a.o. energy infrastructure
 - EU funds to serve as guarantee to leverage private investments
 - Focus on "low-hanging fruits", using innovative financing instruments
 - Proposals for activities to be included in Package are currently being elaborated

EU Regulatory actions survey

- Rationale:
Establishment of a regulatory framework favourable for creating of a strong and robust market for FCH technologies
- Focus on regulatory actions:
 - aiming at establishing a level playing field for FCH technologies in the European energy and transport markets (removing barriers)
 - directly boosting the deployment thereof.
- Mapping of responsible services across EC, also using input from industry
- On-going activity, aim is to get a first draft overview by mid-2015



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EU Regulatory actions survey (2)

Legal text	Issue/Status
Existing specific legislation	
Regulation (EC) No 79/2009 on type-approval of hydrogen-powered motor vehicles and implementing Commission Regulation (EU) No 406/2010	<ul style="list-style-type: none">• Equivalence with UNECE GTR-13• Commission proposal COM(2014)678
Directive on the Deployment of Alternative Fuels Infrastructure (2014/94/EU)	Absence of binding targets for area coverage of refuelling stations
Modifications to ensure level playing field	
Renewable Energy Directive- "RED"; 2009/28/EC	<ul style="list-style-type: none">• Full recognition of green hydrogen from certified renewable electricity as "advanced renewable fuel" from non-biological origin• Increased support (high multiplication factor towards 10% target of renewable fuels in transport, legally binding sub-target for advanced renewable fuels within 10% overall target)• Include use of renewable hydrogen in refineries (hydrocracking and hydrotreating) as contribution to 10% target• To be amended by "ILUC" directive

**work in progress
by EC services**



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EU Regulatory actions survey (3)

Fuel Quality Directive – "FQD", 98/70/EC & 2009/30/EC	to be amended by "ILUC" directive
Council directive on the calculation methods and reporting requirements pursuant to FQD Directive	Some production routes for hydrogen not accounted for in Commission proposal COM(2014)617
Indirect Land Use Change Directive – "ILUC"	EP in autumn 2014
Directive on Energy Labelling of Products, 2010/30/EU and related implementing regulations	Accounting for primary energy savings associated with electricity generated by gas-based stationary fuel cells in micro-CHP
Directive on energy efficiency – "EED"; 2012/27/EU	Simplification of public support schemes
Modifications to promote deployment	
Directive 2008/68/EC on the inland transport of dangerous goods	<ul style="list-style-type: none"> • Enabling trade of hydrogen as energy carrier and as commodity: volume restrictions on compressed gases • Additionally: intercontinental transport of hydrogen
Revision of EU Energy Taxation Directive; Directive 2003/96/EC	<ul style="list-style-type: none"> • correct tax regime for renewable or decarbonised hydrogen for use in transport and heating • Commission Proposal COM(2011)169 does not mention hydrogen explicitly • EP agreement 1st reading April 2012



EU Regulatory actions survey (4)

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Network Code on Requirements for Grid Connection Applicable to All Generators (NC RfG)	<ul style="list-style-type: none"> • Provide alternative regulatory solutions to enable FC micro-CHP to gradually comply with frequency stability requirements • Ongoing discussions between Commission, Member States and industry
Proposal for a Regulation on requirements relating to emission limits and type-approval for internal combustion engines for non-road mobile machinery	<ul style="list-style-type: none"> • Stricter emission limits + expansion of scope in terms of power ranges and non-road transport modes • Commission proposal on emission limits and type approval of ICE for NRMM COM(2014)581
Revision to Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles (2009/33/EC)	<ul style="list-style-type: none"> • Investigate preferential public procurement schemes • Investigate minimum share requirements of ZEVs in public and corporate fleets
Framework conditions for energy storage enabling deployment of hydrogen storage at appropriate locations in the overall energy chain	<ul style="list-style-type: none"> • Recognise storage facilities as separate asset class • Energy storage not to be considered as final consumption and regulated as such • Conditions for storage to participate in ancillary services • Clarify ownership of storage assets by network operators
Regulatory framework and EU harmonised gas standard	Decarbonisation of NG grid through use of HCNG and from there in transport, industry, heating

4. Power to Gas



- **Workshop organised by JRC Petten with EARTO and CEN-CENELEC, 20-21 October**
 - **Putting Science into Standards: Power-to-Hydrogen and HCNG**
- **~100 participants from industry, research and policy makers**
- **Investigating 4 distinct topics:**
 1. **Power-to-hydrogen by electrolysis,**
 2. **Admixture of hydrogen to the natural gas grid,**
 3. **Impact of HCNG blends on materials and on the performance in end-use applications,**
 4. **The provision of ancillary services in support of the electricity grid.**

Slides available at

<https://ec.europa.eu/jrc/en/event/workshop/workshop-putting-science-standards-power-hydrogen-and-hcng/presentations-keynotes-conclusions>

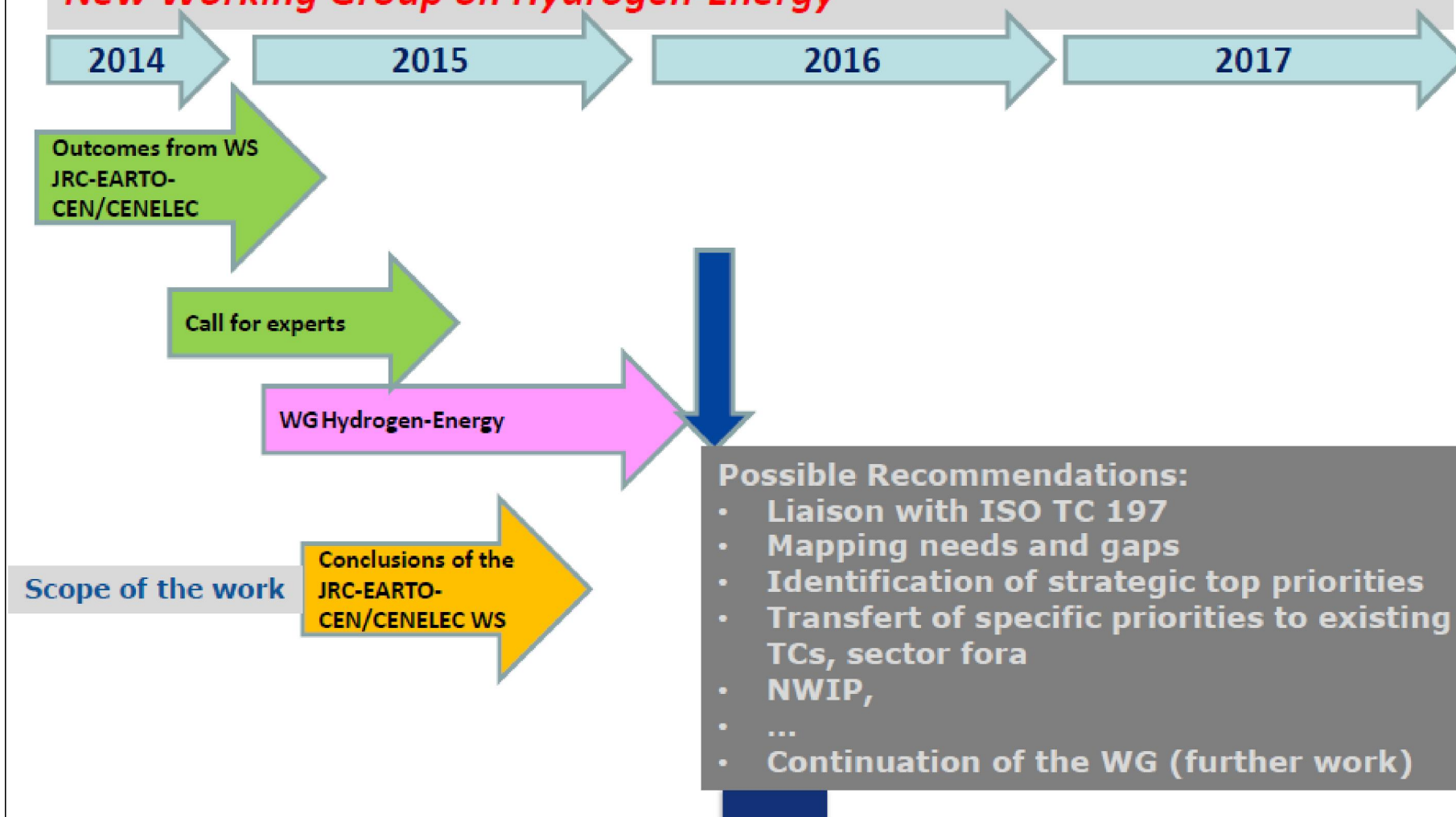
Some conclusions from the Workshop:

- **Electrolysers:**
 - Regulatory framework needs updating, business cases and scenarios developed
 - Grid operators and end users to be involved
 - Demonstration projects needed
- **Admixture in grid:**
 - EU understanding of H2 tolerances needs to be established, including fluctuating H2 compositions
 - Cost for adaptation to be established
- **HCNG impact on users:**
 - How to deal with gas quality fluctuations?
 - Public acceptance, certification of installations
- **Ancillary services:**
 - Grid balancing needs for RES integration
 - TSO/DSO to be involved

CEN & CENELEC

Roadmap : Opportunities for Power to Hydrogen and HCNG

New Working Group on Hydrogen-Energy



4. EU assessment of IPHE added value



- EU has benefited from exchange of best practices and strategies at IPHE level
- Most concrete output:
 - standardisation and regulations, including safety
- **Greatest needs:**
 - Further streamlining standardisation & safety
 - Harmonisation of regulations and incentives worldwide
 - Increasing public awareness
- EU committed to participating to first 2 priorities
 - Communication and awareness raising best handled at national/regional level

**THANK YOU FOR YOUR
ATTENTION**