JRC's Mission and Role

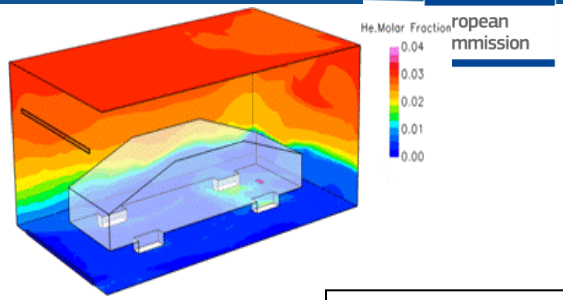
… is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Direct research:
JRC is the European Commission's in-house science service and the only DG executing direct research; providing science advice to EU policy.

*Serving society, **stimulating innovation**, supporting legislation*

FCH at JRC

H2 storage

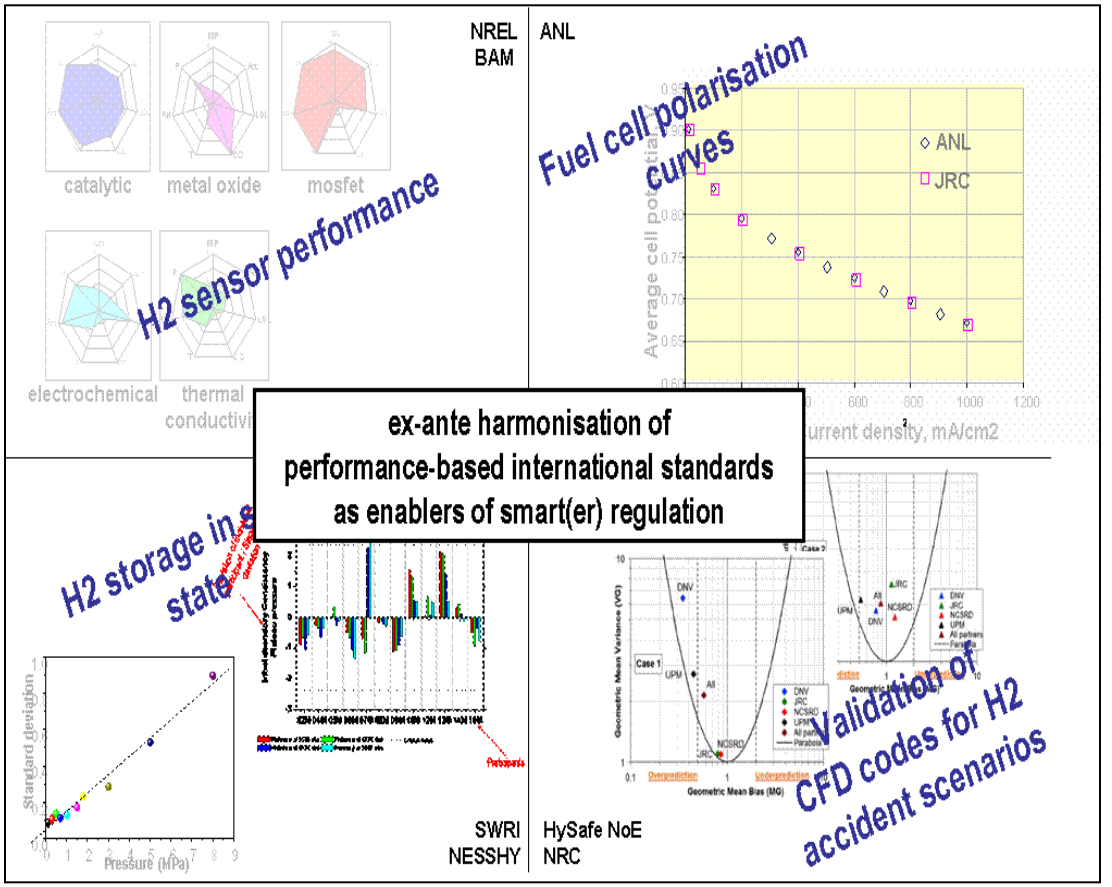


H2 safety

reformer

fuel cells, stacks
PEMFC, SOFC

H2 sensors



European Commission

EU Philosophy for legislation and standards:

UNECE

(1) Legislation (directives, regulations) specifies minimum/essential requirements

CE

performance, ***safety****, emissions, sustainability, ….*

(2) Legislation should not be prescriptive on technical implementation

(3) European standards can be referred to and compliance with standard implies conformity with the legislative essential requirements

Technology advances are accounted for through periodical revision of standards

- global application of technologies: use international standards ISO, IEC

CEN CENELEC → ISO IEC

- scientific basis for standard development and revision through PNR

EU provides support to PNR that addresses societal needs:

health, safety, sustainability, security, …

with explicit role for JRC: *Regulation (EU) No 1025/2012*

Science-based Input to EU legislation and standardisation

JRC

▽

Scientific-based Support

▽

EU Legislation Standardisation

▽

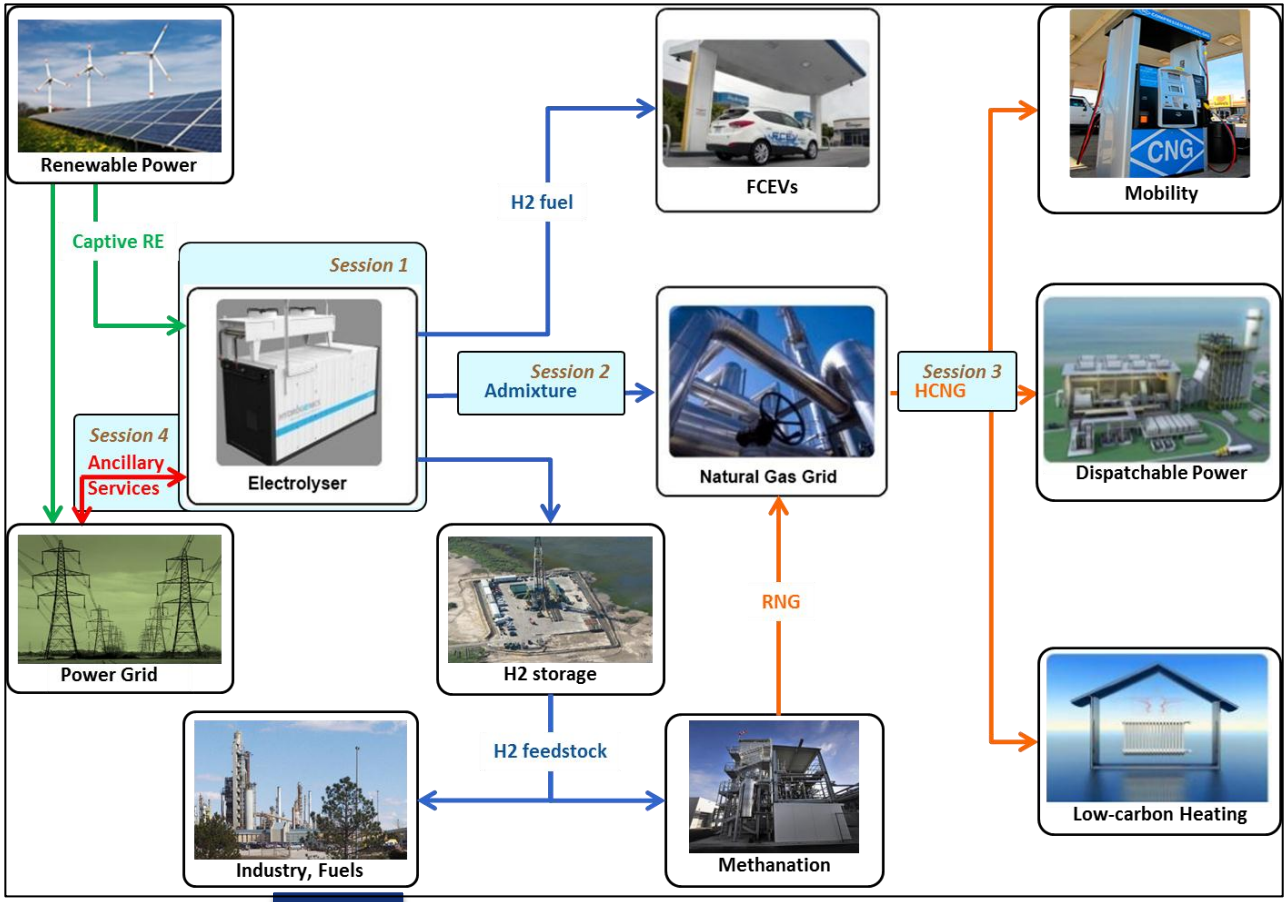
Innovation Jobs & Growth

Workshop

"Putting Science into Standards: Power-to-Hydrogen and HCNG"

Hosted by EARTO, the European Standards Organisations and the European Commission's Joint Research Centre

JRC Petten, The Netherlands, 21-22 October 2014



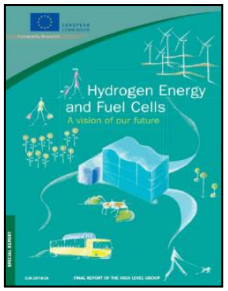
European Commission

interest by EU policy makers

2003 2008 present 2020

FCH 2 JU, Streamlining of national efforts

New Energy World JU
fuel cells & hydrogen for sustainability



IPHE

JRC support to legislation on FCH

ISO IEC

2009 Liaisons 2015 2020

HPMV type approval

HRS: Directive AFI

HRS Standards

HFCV-SGS

GTR 13 phase 1

GTR 13 phase 2

UNECE

JRC support to technology innovation: pre-normative research

(1) Partner with EU industry and research institutions

industry

policy

research

Identify R&D needs

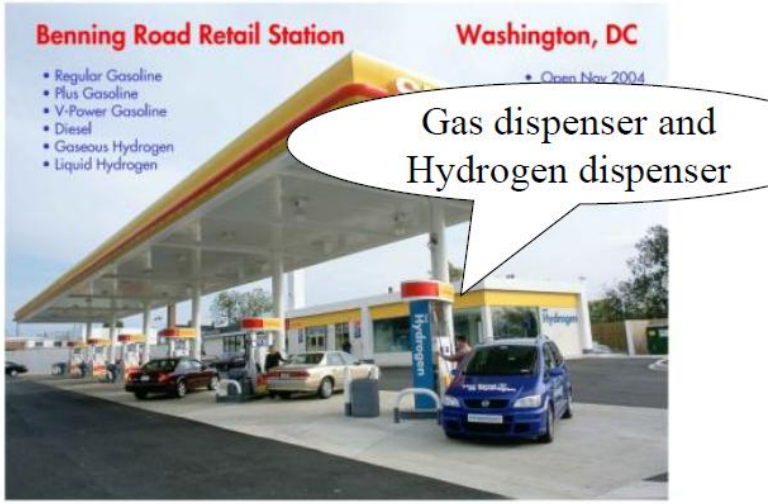
Perform priority R&D

Science-based input to Standards and Regulations

(2) Harmonise internationally

Hydrogen fueling station at Ichihara

Hydrogen fueling station in US

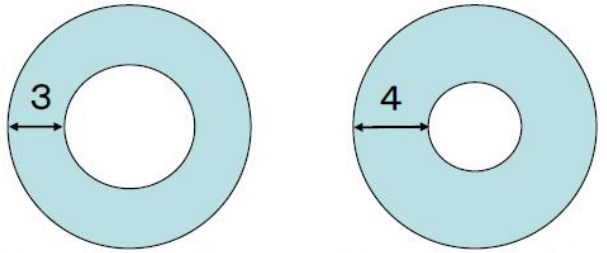


- In the U.S. and Europe, design coefficients *) smaller than Japanese standards are used

	Storage cylinder	Pipe
Domestic	3.5 ~ 4	4
U.S./Europe	2.4 ~ 3.5	3

*) The greater the value, thicker the pipe

- Cross-section view of Storage cylinder



Source : JX Nikko Nisseki Energy

Cost reduction through new regulations: from > 600 million ¥ to < 200 million ¥

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	• 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 work in progress by EC services	• 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

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	• 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	• 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

Network Code on Requirements for Grid Connection Applicable to All Generators (NC RfG)	• 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	• 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)	• 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	• 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