



Hydrogen Energy

Building a sustainable,
low-carbon society

CEN/CLC, JRC, SFEM Hydrogen - Gap assessments started a long time ago

2014-2015

 Gap assessment
2016 - Updated 2019

 Standards
developed /under development


JRC SCIENCE AND POLICY REPORTS

Workshop report: summary & outcomes
Putting Science into Standards
Power-to-Hydrogen and HCNG

Workshop organised by
EC-JRC, CEN-CENELEC, EARTO
21-22 October 2014, Petten

Michel Honselaer
Eveline Weidner
Marc Sleen

2015

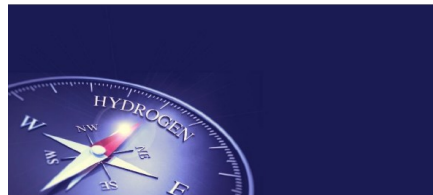


NEN

CEN - CENELEC
Sector Forum Energy Management /
Working Group Hydrogen

Final Report

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CEN CENELEC



- JTC6 Hydrogen in energy systems
 - WG1 Terminologies
 - WG2 Guarantees of Origin

- TC268 WG5
 - EN 17124: Hydrogen fuel - Product specification and quality assurance
 - EN 17127: Outdoor hydrogen refuelling points dispensing gaseous hydrogen and incorporating filling protocols
 - EN ISO 17268: Gaseous hydrogen land vehicle refuelling connection devices

Over 80 contributors

Hydrogen Council - A business perspective on Gap Assessment



Based on a detailed analysis and stakeholder contribution, 13 key gaps across 7 segments were elaborated and condensed into one-pagers

Public policy analysis

All covered geographies in the analysis are developing hydrogen industries and RCS, led by the US and the EU.



Gap analysis

The gap analysis conducted by N-ABLE identified over 400 RCS gaps through desktop review, interviews and expert review. These were further refined through a mapping process, survey and forums with H2C members.



Stakeholder contribution

Five online forums gathering H2C members, as well as a detailed review and two workshops with the task force enabled to refine the final gap list.

Safety culture	#1	Safety culture in relation to hydrogen
Refueling	#2	Hydrogen refueling station and vehicle CHSS – Systemic approach to interface design
Gaseous storage	#3	Uniform solutions for connections and transfer between distribution infrastructure and HRS
	#4	Standards for heavy-duty road vehicles
	#5	Safety management for CHSS in road transport vehicles
Liquid & gaseous storage	#6	Non-industrial classification and implications for permitting and regulatory issues
	#7	Uniform approach to determine hazardous areas for CHSS and liquid hydrogen
Liquid storage	#8	Standards and regulation for onboard storage in road transport vehicles
Large-scale electrolyzers	#9	Harmonized methodologies to define safety distances for large-scale electrolyzer operations
	#10	Standards and test protocols for electrolyzers providing electricity grid services
	#11	Standardized design and test requirements for electrolyzers operating under dynamic conditions
Environmental impact measurement	#12	Metrics and methodologies for measuring sustainability attributes of hydrogen
	#13	Common rules and standards to underpin hydrogen certification systems

Key findings

The RCS gaps covered mainly fall into **safety, performance and cost categories** and apply to the **production of hydrogen and its use for mobility**.

The majority of the 14 RCS gaps have been rated as **highly critical** and may be addressed within **two to three years**.

Other gaps of interest

Other critical gaps identified but not included in the final one-pagers focused on the following overarching topics:

- ▶ Risk assessment methodologies and scenarios
- ▶ Mitigation concepts and strategies
- ▶ Performance monitoring and testing procedures.

Each sector has specific needs

Example of Aeronautics: SAE SAFSG
Gap assessment under way

SFEM Workshops Feb 2022

Aviation

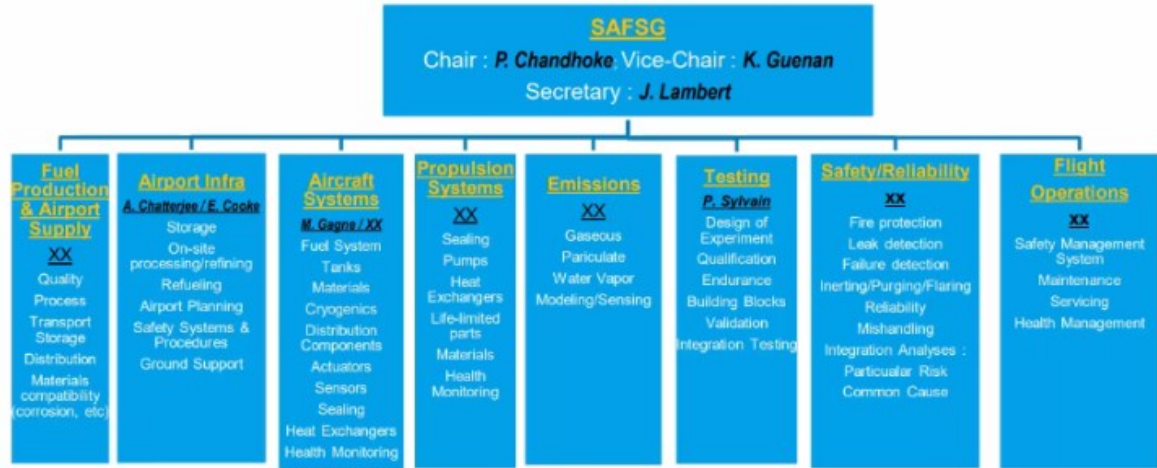
Heavy Duty Refueling

Rail

Maritime

LH2

SAFSG Task Groups (proposal to be completed).



An aerial photograph of a multi-lane highway bridge supported by concrete pillars, crossing a green valley. A white semi-truck is driving on the bridge. A white circle highlights the truck, and a white square is overlaid on the circle.

Thank you!

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Public