

## INTERNATIONAL WORKSHOP

### Metrology for sustainable hydrogen energy applications

#### 7 & 8 November 2018

Air Liquide, R & D Center - Paris-Saclay  
1 Chemin de la Porte des Loges, Les Loges-en-Josas - BP 126  
78354 Jouy-en-Josas, France

### Target Audience and Workshop Description

This workshop is dedicated to the hydrogen community, industries and R&D communities at the cutting-edge of the technologies for hydrogen production, distribution, storage, gas analysers and fuel cells manufacturers and OEM in the automotive sector and standardization developing organizations who are keen to promote the hydrogen energy sector.

The main objective of the workshop is to highlight the results of the European metrology project *Hydrogen* aiming at:

- addressing standardization needs on hydrogen purity, analytical methods
- developing and validating traceable methods for measuring the hydrogen mass absorbed in metal hydride storage tanks

The workshop will feature a range of industry and metrology research speakers.

These days are the opportunity to showcase the most significant and promising developments and results in hydrogen fuel quality and storage in real use conditions. The workshop is focused on scientific-oriented approach to communicating science driven by the industrial needs faced with metrology and regulatory issues.

#### Two sessions compose the workshop:

- ✚ One **training** session leading to practical information from the scientific activities of the project and actual result to supplement standards on their elaboration or revision path. What perspective towards a broad and easy use of hydrogen emphasising end-user expectation?
- ✚ One **workshop** session tackling among others the hydrogen vehicle market, the challenges of hydrogen production, the hydrogen impurity analytical methods, the impurity risk assessment for the marketed and future generation of fuel cells and the methods for measuring the hydrogen mass absorbed in metal hydride storage tanks.

Cross-cutting themes for hydrogen such as the standardization role, sampling, transport and security/safety will be addressed.

---

### Registration (deadline: October 5, 2018)

Free entrance at the workshop for both days.

To register, please fill in the form available at <http://projects.lne.eu/jrp-hydrogen/workshop/>

Contact persons:           ✚ Bruno Gozlan: [bruno.gozlan@airliquide.com](mailto:bruno.gozlan@airliquide.com)  
  ✚ Frédérique Haloua: [frederique.haloua@lne.fr](mailto:frederique.haloua@lne.fr)

Attendance is limited, so **REGISTER NOW!**

## 7 November PM: TRAINING SESSION

<b>13:30 – 13:40</b>	Welcome and Opening	Air Liquide
<b>13:40 – 14:15</b>	Short introduction of the EMPIR Metrology Programme and presentation of the <i>Hydrogen</i> project	LNE
<b>14:15 – 14:40</b>	Role of Standardization	AFNOR
<b>15:00 – 16:15</b> Parallel sessions	<b>Room 1:</b> Hydrogen purity measurements according to ISO 14687-2 and risk assessment for fuel cells	NPL
	<b>Room 2:</b> Analytical methods review for hydrogen quality control according to ISO standards	RISE
	<b>Room 3:</b> Mass measurements of hydrogen absorbed in metal hydrides and the revised ISO 16111	MAHYTEC
<b>16:15 – 16:35</b>	<b>COFFEE BREAK</b>	
<b>16:35 – 17:35</b>	Air Liquide facilities visit – Parallel sessions (Hydrogen Refuelling Station or Laboratories)	Air Liquide
<b>17:35 – 17:50</b>	End of day 1 & Closing remarks	Air Liquide
<b>19:00</b>	Possibility to join the Workshop dinner at a restaurant in Versailles (supported by each attendee)	

**8 November: WORKSHOP SESSION**

<b>9:30 – 9:40</b>	Welcome and Opening	Air Liquide
<b>9:40 – 10:00</b>	Present and future hydrogen vehicle market demands	Toyota
<b>10:00 – 10:20</b>	Progress, status and challenges in hydrogen production	Air Liquide
<b>10:20 – 10:40</b>	Implementation specifications for HRS dispensers	TBC
<b>10:40 – 11:00</b>	Sampling and analysis of hydrogen from refuelling stations in Europe	SINTEF
<b>11:00 – 11:20</b>	<b>COFFEE BREAK</b>	
<b>11:20 – 11:40</b>	Check of risk assessment of impurities in hydrogen for fuel cells, based on analytical data	AH2GEN/AL/NPL
<b>11:40 – 12:00</b>	Impact of key impurities on fuel cell degradation	CEA
<b>12:00 – 12:20</b>	Impurities found in real hydrogen production samples	NPL
<b>12:20 – 12:40</b>	Analytical method development for the most challenging impurities	VSL/RISE
<b>12:40 – 13:40</b>	<b>LUNCH</b>	
<b>13:40 – 14:00</b>	Hydrogen storage: Measurement methods for hydrogen mass in storage tanks	MAHYTEC
<b>14:00 – 14:15</b>	Closure of the Workshop: follow-up of the actions / feedback from the audience / additional information	
<b>14:15 – 15:15</b>	Air Liquide facilities visit – Parallel sessions (Hydrogen Refuelling Station or Laboratories)	Air Liquide