



## INTEGRATION OF NOVEL STACK COMPONENTS FOR PERFORMANCE, IMPROVED DURABILITY AND LOWER COST

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*Project Coordinator: Johnson Matthey plc*

### DELIVERABLE REPORT

<b>D7.4: ORGANISATION OF AN FCH-JU PROJECT WORKSHOP</b>		
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<b>DISSEMINATION LEVEL</b>		
<b>PU</b>	<i>Public</i>	<b>X</b>
<b>PP</b>	<i>Restricted to other programme participants (including the Commission Services)</i>	
<b>RE</b>	<i>Restricted to a group specified by the consortium (including the Commission Services)</i>	
<b>CO</b>	<i>Confidential, only for members of the consortium (including the Commission Services)</i>	
<b>NATURE OF THE DELIVERABLE</b>		
<b>R</b>	<i>Report</i>	
<b>P</b>	<i>Prototype</i>	
<b>D</b>	<i>Demonstrator</i>	
<b>O</b>	<i>Other</i>	<b>X</b>

<b>SUMMARY</b>	
<b>Keywords</b>	<i>Dissemination, FCH JU PEFMC development workshop</i>
<b>Abstract</b>	<p><i>The INSPIRE team hosted a workshop in Marseille on 5<sup>th</sup> and 6<sup>th</sup> March 2019, combining several FCH JU H2020 projects focused on PEM fuel cell components together for poster sessions, forums and project presentations.</i></p> <p><i>The workshop presented recent advances relating to catalysts and catalyst supports, membrane, MEA, bipolar plates, stack assembly and fuel cell characterisation testing, and was an opportunity for FCH JU projects to network and exchange both information and technical developments.</i></p>

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## **D7.4: ORGANISATION OF AN FCH-JU PROJECT WORKSHOP**

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## 1. INTRODUCTION

This deliverable report describes the workshop organised by the INSPIRE project team. It was a technical information-sharing event focusing on PEMFC components and their integration into fuel cell stacks. The aim was to link together and strengthen synergies between H2020 FCH JU projects, with respect to new component developments, best practices and successes.

The workshop was free of charge for the participants.

The website for this workshop may be found at <http://www.inspire-fuelcell.eu/>



## 2. DESCRIPTION OF THE WORKSHOP

The INSPIRE team hosted the workshop in Marseille on 5<sup>th</sup> and 6<sup>th</sup> March 2019, combining several FCH JU H2020 projects focused on PEM fuel cell components together for poster sessions, forums and project presentations.

The workshop presented recent advances relating to catalysts and catalyst supports, membrane, MEA, bipolar plates, stack assembly and fuel cell characterisation testing, and was an opportunity for FCH JU projects to network and exchange both information and technical developments.

The following projects were represented:

- CRESCENDO: [www.crescendo-fuelcell.eu](http://www.crescendo-fuelcell.eu)
- DIGIMAN: [www.digiman.eu](http://www.digiman.eu)
- Fit-4-AMANDA: [www.fit-4-amanda.eu](http://www.fit-4-amanda.eu)
- GAIA: [www.gaia-fuelcell.eu](http://www.gaia-fuelcell.eu)
- GRASSHOPPER: [www.grasshopperproject.eu](http://www.grasshopperproject.eu)
- HYDRAITE: [www.hydraite.eu](http://www.hydraite.eu)
- ID-FAST: [www.id-fast.eu/](http://www.id-fast.eu/)
- INSPIRE: [www.inspire-fuelcell.eu](http://www.inspire-fuelcell.eu)
- MAMA-MEA: [www.mama-mea.eu](http://www.mama-mea.eu)
- VOLUMETRIQ: [www.volumetriq.eu](http://www.volumetriq.eu)



The forums brought some extremely interesting interactions and discussion points:

- Ultra-low loadings,  $<0.1 \text{ mg/cm}^2 \text{ Pt}$ , require catalyst activities to be very high but are not necessarily practical solutions for the fuel cell transport industry.
- Ultra-low loadings are a real risk with respect to both high current density performance and durability. The requirements for automotive OEMs to implement voltage limit controls will increase system complexity and cost.
- Ultra-low loadings are also extremely sensitive to pollutants which currently exist from refuelling stations but also from air pollution.
- Recycling of all components now needs to be taken into account when looking at life cycle rather than just individual component costs.
- The current membrane developments are significant and could have real advantages for electrolysis if these advancements could be translated to the PEM electrolysis industry.
- The future of bipolar plates for transport applications is likely with stamped metal plates thanks to their superior electrical conductivity, mechanical properties, ease of mass manufacture and the smaller cell pitch. However, for the current heavy-duty applications, such as range extenders for delivery vans or stationary use, the option of moulded graphite plates represents a far lower durability risk within the short term.
- The team also highlighted that, while automotive drive cycles were well accepted by the industry, heavy duty transport drive cycles were not widely available.
- Volume manufacturing technology development was highlighted as an area which needs further attention, especially the development of appropriate (in-line) QC methods.



*Workshop attendees*

### 3. PROGRAMME

#### Tuesday 5 March 2019

18.30: **Networking and poster session**

20.00: *Networking Dinner*

#### Wednesday 6 March 2019

8.45 – 9.00 **Welcome and introductions**

*Silvain Buche, JMFC, UK*

9.00 – 10.00 **Catalyst and catalyst support advancements in current FCH JU projects**

*Alex Martinez Bonastre, JMFC, UK*

- INSPIRE/GAIA: new alloy development
- CRESCENDO: non-PGM catalyst

10.00 – 11.00 **Membrane advancements in current FCH JU projects**

*Deborah Jones, CNRS, France*

- VOLUMETRIQ, INSPIRE/GAIA: membrane support development
- GRASSHOPPER: thicker stationary membrane development

11.00 – 11.30 *Coffee Break*

11.30 – 12.30 **Membrane Electrode Assembly advancements in current FCH JU projects**

*Adam Hodgkinson, JMFC, UK*

- VOLUMETRIQ/INSPIRE/GAIA: MEA development
- MAMA-MEA: concept

12.30 – 13.30 *Lunch*

13.30 – 14.30 **Stack development**

*Joachim Scherer, DANA, Germany & Thomas Wannemacher, Proton Motor, Germany*

- INSPIRE: Development of metallic bipolar plates for high performance PEFC stack
- Fit-4-Amanda: Stack build automation development

14.30 – 15.00 **HYDRAITE project aim and update**

*Jari Ihonen, VTT, Finland*

15.00 – 15.30 **ID-FAST project aim and update**

*Sylvie Escribano, CEA, France*

15.30 – 16.00 Summary and workshop end

### 4. CONCLUSIONS

Overall this was a very successful workshop which enabled FCH JU projects with common interests to share their successes and best practices and create new links which will benefit the industry throughout. The INSPIRE team want to thank all that attended and took such an active part in the discussions.

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