This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under grant agreement No 101006641. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.

IMPROVED LIFETIME STACKS FOR HEAVY DUTY TRUCKS THROUGH ULTRA-DURABLE COMPONENTS

Grant agreement no.: 101006641
***Start date**: 01.01.2021 – **Duration**: 36 months*
***Project Coordinator**: D. J. Jones, CNRS*

DELIVERABLE REPORT

D7.3: PROGRESS TOWARDS WP7 OBJECTIVES WITH 6 COMMUNICATION AND 8 DISSEMINATION ACTIVITIES	
Due Date	31/10/2022
Author (s)	N. Cros (PXO)
Workpackage	WP7
Workpackage Leader	PXO
Lead Beneficiary	PXO
Date released by WP leader	17/10/2022
Date released by Coordinator	17/10/2022

DISSEMINATION LEVEL		
PU	*Public*	***X***
PP	*Restricted to other programme participants (including the Commission Services)*	
RE	*Restricted to a group specified by the consortium (including the Commission Services)*	
CO	*Confidential, only for members of the consortium (including the Commission Services)*	

NATURE OF THE DELIVERABLE		
R	*Report*	***X***
P	*Prototype*	
D	*Demonstrator*	
O	*Other*	

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Clean Hydrogen Partnership

Co-funded by the European Union

SUMMARY	
Keywords	Dissemination and communication activities
Abstract	This report presents the consortium achievements in terms of dissemination and communication activities for the first 22M of the IMMORTAL project.
Public abstract for confidential deliverables	*Same as above*

REVISIONS			
Version	**Date**	**Changed by**	**Comments**
0.1	17/10/2022	PXO	Drafted
0.2	17/10/2022	CNRS	Revisions
0.3	18/10/2022	PXO	Finalised

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PROGRESS TOWARDS WP7 OBJECTIVES WITH 6 COMMUNICATION AND 8 DISSEMINATION ACTIVITIES

CONTENTS

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1 INTRODUCTION

To ensure good visibility of the project and to promote the scientific results obtained by the consortium, the IMMORTAL project targeted 8 communication and 6 dissemination activities at M22. According to this plan, the partners have been engaged in conducting those activities and the actions undertaken are detailed below.

To protect the intellectual property rights, confidentiality and legitimate interests of the partners, it is important to highlight that each communication or dissemination action, before its official release, followed a dissemination protocol process based on the grant Agreement Article II.30 (D7.2).

2 DISSEMINATION & COMMUNICATION ACTIVITIES AT M22 OF IMMORTAL

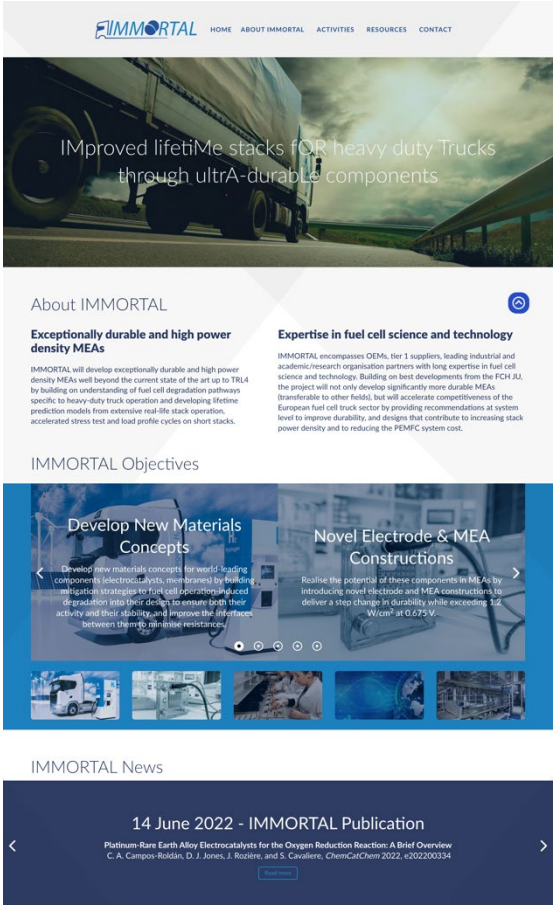
2.1 Communication activities

Logo

As an essential tool to identify the IMMORTAL project, a logo was designed to clearly identify the project and is linked with a graphic chart used in all dissemination or communication supports for the project.

It is available to all partners on the Project Shared Workspace (PSW).

Project website



The IMMORTAL project website (Figure 1) was released at M3 (www.immortal-fuelcell.eu/). It was designed to communicate and disseminate information including project overall objectives, partner & work package information, project activities, project resources and project contact information to the scientific community and the public.

The project website is updated on a regular basis with information on project activities (news, meetings, publications, public deliverables…) and project resources (links, related events…).

Since its release, the public web site has been visited with an average of 90 unique visits per month with a total of about 1700 unique visits.

Figure 1: Screenshot of the IMMORTAL website homepage

Brochure

A brochure presenting the IMMORTAL project and its objectives was released at month 9. This brochure is available on the PSW as well as on the project website (PDF) and was also circulated among the partners for its distribution during their attendance at international conferences for example.

Newsletter #1

A newsletter was released and included main achievements of the project in the first 18 months.
This newsletter is available on the PSW, the public website (PDF) and was spread using partner's LinkedIn account: LinkedIn post (400 views)

Outreach activities

29 January 2021 - **STEM talk to secondary school triple science students on Fuel Cells and Hydrogen**

As part of the communication activities in the IMMORTAL project, Johnson Matthey took part in a virtual STEM talk (Science, Technology, Engineering and Mathematics) on hydrogen technologies. This provided an opportunity for triple science pupils in year 11 to experience science and technology and see how important it is for our future well-being, particularly in energy and fuel cells. The talk involved discussion on the measurable data available to climate change and how to assess fact and fiction. The issues of global versus local pollution. The need for multiple solutions to different transport applications was then discussed, a problem especially relevant to IMMORTAL. Introduction to the students of power train weight and volume, differences between batteries and fuel cells, refueling times and infrastructure needs provided very insightful discussions.

Finally, an introduction to how hydrogen can be produced and the concepts of well to wheel efficiencies enabled the students to put all modes of energy generation in context. As a final way for the students to experience the R&D environment a video walk through the labs was provided.

Press releases

- **5 MAY 2021 - Fuel Cell Bulletin -** CNRS press release published in the Fuel Cell Bulletin Issue 5, Volume 2021, May 2021, Page 15.
- **3 MAY 2021 – LinkedIn H2Haul -** H2Haul announced cooperation with IMMORTAL on their LinkedIn account.
- **15 APRIL 2021 – LinkedIn -** Fuel Cells & Hydrogen Joint Undertaking (FCH JU) shared the Johnson Matthey press release on their LinkedIn account
- **15 APRIL 2021 - Johnson Matthey** (Direct link) - JM joins new European consortium to develop advanced fuel cell technology for heavy-duty trucks.
- **15 APRIL 2021 – Prnewswire** - European supported project launched to develop advanced fuel cell technology for heavy duty trucks with the goal of decarbonising freight transport.
- **15 APRIL 2021 – LinkedIn - Johnson** Matthey shared their press release on their LinkedIn account
- **15 APRIL 2021 – Twitter -** Johnson Matthey shared their press release on their Twitter account

2.2 Dissemination activities

Networking

- **Mission Innovation - Hydrogen Innovation Challenge meetings**

The project is contributing to the activities on Mission Innovation – Hydrogen Innovation Challenge by cooperation with the US Department of Energy (DOE) **Million Mile Fuel Cell Truck Consortium (M2CFT)** and with **NEDO FC-Platform, Japan**.
Those discussions have been organised into 3 groups:

1. Stressors related to heavy duty
2. Characterisation
3. Benchmarking and protocols

During this first period, bi-monthly meetings were organised and IMMORTAL partners presented their results during two of them:

- **23 November 2021: meeting group 1**: presentation by Leonidas Tsikonis (FPT) on *Load profile test development from heavy duty drive cycles in relation to fuel cell stressors: First insights from the IMMORTAL EU project*
- **11 May 2021: meeting group 1:** presentation by Thomas Mittermeier (Bosch) on *HD stack egradation assessment and lifetime prediction*

- **Networking with European funded projects**

IMMORTAL and FCH JU project H2HAUL (Hydrogen fuel cell trucks for heavy-duty, zero emission logistics) have engaged in online meetings.

Conference and workshop presentations

Electrochemistry 2022, 27 - 30 September 2022, Berlin, Germany

- CNRS poster presentation: Carbon-Supported Platinum-Rare Earth Electrocatalyst Nanostructures as for the Oxygen Reduction Reaction, C. A. Campos-Roldán, R. Chattot, A. Parnière, R. Bacabe, F. Pailloux, P.Y. Blanchard, D. Jones, J. Rozière, S. Cavaliere

TUM TEC summer seminar, 7 September 2022, TUM, Munich, Germany – Summer school

- Bosch oral presentation: Heavy duty PEM Fuel Cell Degradation Assessment and Lifetime Prediction in the IMMORTAL EU Project, T. Mittermeier

Gordon Research Conference - Integrating Theory, Synthesis, Characterization and Validation for the Advancement of Fuel Cell Research, 24 - 29 July 2022, Smithfield, RI, United States

- IMTEK poster presentation: Platinum catalyst stressor studies towards realistic accelerated durability tests for heavy-duty polymer electrolyte fuel cells, J. Stiegeler, C. Schwarz, T. Mittermeier, T. Lehre, L. Tsikonis and S. Vierrath

French CNRS Hydrogen Federation (Fédération Hydrogène FRH2), 30 May - 3 June, Aussois, France

- CNRS oral presentation: Supports de carbone fonctionnalisés pour cathodes de pile à combustibles plus stables et actifs, A. Parnière, P.-Y. Blanchard, S. Cavaliere, N. Donzel, J. Rozière, D. J. Jones

Heavy Duty Protocols International Discussions, 23 November 2021, Online

- FPT oral presentation: Load profile test development from heavy duty drive cycles in relation to fuel cell stressors: First insights from the IMMORTAL EU project, L. Tsikonis

Publications

- **Platinum-Rare Earth Alloy Electrocatalysts for the Oxygen Reduction Reaction: A Brief Overview,** C. A. Campos-Roldán, D. J. Jones, J. Rozière, and S. Cavaliere, ChemCatChem 2022, e202200334 - DOI: https://doi.org/10.1002/cctc.202200334 - OPEN ACCESS
- **Nitrogen Plasma Modified Carbons for PEMFC with Increased Interaction with Catalyst and Ionomer,** A. Parnière, P.-Y. Blanchard, S. Cavaliere, N. Donzel, B. Prelot, J. Rozière and D. J. Jones, 2022 *J. Electrochem. Soc.* **169** 044502 – DOI: https://doi.org/10.1149/1945-7111/ac609e - OPEN ACCESS

3 CONCLUSION

Concerning the deliverable's objectives, the project consortium, despite the interruptions of covid-19, has achieved its planned communication and dissemination actions in the first 22 months.

During the next period, the project partners will continue disseminating project results, and the following activities are already planned:

- Conference presentations:
  - **33rd Topical Meeting of the International Society of Electrochemistry, Santiago, Chile, 27-30 November 2022** - CNRS invited presentation: Structure-Reactivity Relationships and Reactivity Descriptors for the Rational Design of Pt-Rare Earth Catalytic Surfaces, D. J. Jones, C. Campos Roldan, A. Parniere, S. Cavaliere, P. Y. Blanchard, N. Donzel, M. Dupont, F. Lecoeur, R. Chattot, J. Rozière
- A publication drafted by CNRS is under the dissemination protocol process among the partners:
  - **Structure Dynamics of Carbon-Supported Platinum-Neodymium Nanoalloys during the Oxygen Reduction Reaction**, C.A. Campos-Roldán, R. Chattot, F. Pailloux, J.S. Filhol, H. Guesmi, A. Zitolo, J. Drnec, D. Jones, J., Roziere, S. Cavaliere
- Organisation of an **IMMORTAL workshop on Heavy Duty Transport MEAs: Materials, Testing and Lifetime Prediction at M33**
- Continuing networking activities

The IMMORTAL partners will of course continue to monitor all the dissemination and communication measures and evaluate them at progress meetings. Partners will report on communication activities carried out or planned, using indicators including the type of presentation at conference events, number of project flyers and newsletters distributed, as well as press release / media articles published and their impact on the project visibility.