



## Deliverable D6.4

### Report on the external stakeholder engagements conducted at the start of the PRHYDE project – Workshop 2

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## R E P O R T

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## **ACRONYMS AND ABBREVIATIONS**

SoC	State of Charge
WP	Work Package
WS	Workshop



# 1 INTRODUCTION

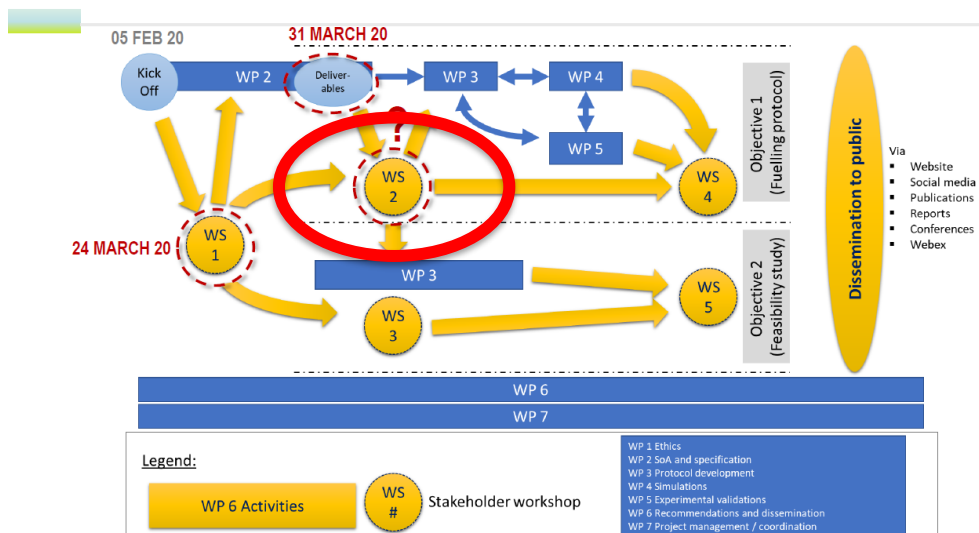
This document captures the efforts in the early stages of the PRHYDE project to enable the project consortium to seek input from outside of the project, and enable external stakeholders to give feedback to be considered, by conducting a series of small surveys at the start of the project.

Additionally, in order to broaden the awareness of the project with external stakeholders, disseminate the anticipated activities to be carried out within the project and enable external stakeholders to give feedback to be considered, workshops / webinars were conducted.

As can be seen in Figure 1 below, two in-person workshops were scheduled to be carried out within the first 5 months of the project:

- Workshop 1: Scheduled for either month 2 or 3 – in order to explain the anticipated activities within the project, and start to gather input for the early stage WP2 and WP3 deliverables (and if appropriate WP4 and WP5) (Further information on this workshop is provided in the PRHYDE Deliverable 6.3 <sup>1</sup>)
- Workshop 2: Scheduled for either month 4 or 5 – in order to present and explain the first deliverables from the project, and gather any final input needed for the first stages of the project. Details on this workshop and feedback received are covered in this Deliverable D6.4.

## Work plan – Workshops



**Figure 1: PRHYDE work plan – initial workshops supporting the work of WP2, whilst also disseminating the project goals, and anticipated activities to external stakeholders**

<sup>1</sup> Deliverable D6.3 “Report on the external stakeholder engagements conducted at the start of the PRHYDE project – Surveys and Workshop 1” is available on the PRHYDE website at <https://prhyde.eu/progress/>.

The original intention was for these events to be highly “interactive” in-person workshops, however due to developments with the Covid-19 coronavirus, it was necessary to move these to being solely Web-based meetings, essentially a much shorter webinar in each case. These consisted of a series of presentations from the consortium, and selected invited guests, and then allowed limited time for people to ask a small number of questions.

The questions raised during (and after) the second webinar, following the presentations given, are captured in this document, along with answers following consideration by the PRHYDE consortium.

The situation however made it unpractical to have the desired “live” discussion, given the number of stakeholders joining the webinars – successful from the perspective of dissemination but not conducive to discussion in the way that an in-person workshop allows.

As a result, it was extremely difficult to enable stakeholders external to the project to provide input, and feedback. To try to resolve this without affecting the timeframe of the project, members of the consortium gave a short update on progress in the second webinar, with an intention follow it up, if necessary, with a series of focused web meetings, with smaller numbers of (invited) participants in each, to be held later in the project.

The intention of this document is to capture a number of things from the external stakeholder engagement:

- A brief report from the second webinar, the presentations given, and the questions raised during the webinar



## 2 WORKSHOP 2 REPORT

The second workshop included an introductory presentation on each of the deliverables anticipated to be published within the coming months, to disseminate these subject areas to the external stakeholders, and to highlight any specific areas where input from outside of the consortium would be considered advantageous. It also included an invited guest speaker from a company called Fill'n'Drive.

### 2.1 Agenda

The agenda is included below:

Timing	Subject	Presenter
14:45	<i>Join webinar</i>	
15:00	Introduction to project (for anyone who couldn't join on the 24th March)	Martin Zerta
15:10	Summary of first webinar	Nick Hart
15:20	<i>PRHYDE deliverable D2.1:</i> Performance targets for refuelling protocols for heavy duty hydrogen vehicles	Quentin Nouvelot
15:35	<i>PRHYDE deliverable D2.2:</i> Requirements for safe heavy duty gaseous hydrogen vehicle refuelling	Lena Glatz, Nick Hart
15:40	Related topic: Safety Watchdog concept	Fouad Ammouri
15:50	<i>PRHYDE deliverable D2.3:</i> Gap analysis of existing heavy duty gaseous hydrogen vehicle refuelling protocols	Nick Hart
	Related topic: Presentation by Fill'n'Drive	Adrien Zanoto
16:15	<i>PRHYDE deliverable D2.4:</i> Gap analysis of existing hardware used for heavy duty gaseous hydrogen vehicle refuelling	Nick Hart, Quentin Nouvelot
16:30	<i>PRHYDE deliverable D2.5:</i> Analysis of existing non-gaseous hydrogen refuelling protocols or applications	Nick Hart
16:35	<i>PRHYDE deliverable D3.1:</i> Report on the characteristics of the cases to be simulated in the preliminary simulations	Claus Sinding
16:50	Next steps / Plans for smaller web meetings (anticipated in May)	Nick Hart
17:00	<i>End</i>	

## 2.2 Dissemination

The questions raised during, and after the first workshop are attached as Annex 1. Where possible, answers or responses to these questions are included – others will be looked at in the WP2 Deliverable D2.6 if possible.

Approximately 85 people attended the workshop.

A number of the presentations are available on the PRHYDE website (<https://prhyde.eu/events/>):

Workshop 2 – PRHYDE presentation slides

[https://prhyde.eu/wp-content/uploads/2020/05/2020-04-23\\_PRHYDE-WS\\_v2.1-1.pdf](https://prhyde.eu/wp-content/uploads/2020/05/2020-04-23_PRHYDE-WS_v2.1-1.pdf)

Survey responses (summary)

[https://prhyde.eu/wp-content/uploads/2020/05/2020-03-24\\_PRHYDE-WS-Survey-responses-v1.1.pdf](https://prhyde.eu/wp-content/uploads/2020/05/2020-03-24_PRHYDE-WS-Survey-responses-v1.1.pdf)

### **3 CONCLUDING REMARKS**

The disruption that the Covid-19 coronavirus caused to the planned schedule for interaction with external stakeholders created difficulties in arriving at a situation where the types of conversations that had been hoped for were able to take place, however, from a perspective of dissemination of the project goals and activities, the workshops were extremely successful, and seemingly positively received.

In order to ensure that the needs for as many key external stakeholders as possible are taken into account however, a different approach to that originally anticipated will be necessary. It is hoped that the series of smaller workshops later in 2020 will enable this.

## What is PRHYDE?

With funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH 2 JU), the PRHYDE project is aiming to develop recommendations for a non-proprietary heavy duty refuelling protocol used for future standardization activities for trucks and other heavy duty transport systems applying hydrogen technologies.

Based on existing fuelling protocols and current state of the art for compressed (gaseous) hydrogen fuelling, different hydrogen fuelling protocols are to be developed for large tank systems with 35, 50, and 70 MPa nominal working pressures using simulations as well as experimental verification. A broad industry perspective is captured via an intense stakeholder participation process throughout the project.

The work will enable the widespread deployment of hydrogen for heavy duty applications in road, train, and maritime transport. The results will be a valuable guidance for station design but also the prerequisite for the deployment of a standardized, cost-effective hydrogen infrastructure.

Further information can be found under <https://www.prhyde.eu>. For feedback on the PRHYDE project or the published deliverables, please contact [info@prhyde.eu](mailto:info@prhyde.eu).

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## Members of the PRHYDE Consortium



## APPENDIX A: QUESTIONS RECEIVED DURING WORKSHOP 2

WP4:

*Workshop 2 participant question:*

**“Will there be any access to simulation models or are these considered IP?”**

Response: The simulation models indeed are considered IP of the respective firms, however, the modelling assumptions and results will be published and summarized in form of a deliverable.

D2.1:

*Workshop 2 participant question:*

**“Is the SOC 90-95% based on your own estimates, or is this confirmed by end users”**

At the early stage of the project, when the presentation was held, this was a consideration, however, the project now intends to target higher SOCs – to be assessed in conjunction with the risk assessment element of WP3.

D2.2:

*Workshop 2 participant question:*

**“Don't we have to take ISO 26262 into consideration? In this standard we are talking about vehicles and ASILs! Since end of 2018 this is published and trucks are described, therefore state of the art!”**

The requirements for reliability of data communicated during refuelling is anticipated to be a subject for standardisation within ISO TC 197 in the future. The method of communication is outside of the scope of the project, and the availability of suitable communications between the station and vehicle is assumed to be something that will be addressed in the future, enabling the fuelling protocol to account for such communicated information.

*Workshop 2 participant question:*

**“IrDA is not a safety protocol; just a little bit of dirt will block the communication.”**

The absence of communicated information is different to correct information being communicated. In the event of no data transfer, a communications protocol simply cannot be utilised. If this leads to no-fuelling at all, or a more conservative “non-comms” protocol is a question to be addressed within the PRHYDE project discussion.

*Workshop 2 participant question:*

**“What we need first according to our analysis is a safe communication. This would help to avoid filling stops because of estimated problems”**

The method of communication is outside of the scope of the project, and the availability of suitable communications between the station and vehicle is assumed to be something that will be addressed in the future, enabling the fuelling protocol to account for such communicated information.

*Workshop 2 participant question:*

**“Why do we stop filling in case of increasing temperatures? If we had proportional valves in the station or proportional valves close to receptacle we could control the flow not only on/off, but in a way fitting to the vehicles tank system.”**

This is something that could be considered within the protocol development within PRHYDE. Current protocols are not able to take account of dynamic data from the vehicle to indicate whether or not fuelling can continue.

WP2 and WP3:

*Workshop 2 participant question:*

**“Are the type 3-4 maximum physical dimensions (so 350 liter) taken as assumptions from the modelling reflecting the trends to which tanks may/will applied in HD trucks”**

Single tank volumes between 50 and 350 litres are assumptions made. Validation of the modelling will use tanks of volumes within that range, but not the boundary volumes.

*Workshop 2 participant question:*

**“Regarding being able to fill 700bar receptacle with 350bar nozzle - this would be useful in the near term, as stations are so few and far between, so if running on empty and the 700bar option is 'out of order' this could mean running out of fuel. In the long term once the infrastructure is in place this would not be such an issue (Travel an extra 10-15 miles to reach the next station, as is the case with petrol stations now).”**

No response necessary