Hydrogen mobility development:
1,600 hydrogen storage systems deployed for manufacturer Hyundai trucks

Faurecia is deploying 1,600 hydrogen storage systems for heavy weight duty to accelerate the development of the zero-emission freight transport sector. This project is part of a collaboration with the car manufacturer Hyundai.

Starting date of the project	2019 for the beginning of the collaboration. 2021 for series storage system delivery.
Project Localisation Places of implementation of the project at this stage and targeted geography if replicable.	The project is located in France (production of hydrogen tanks by Faurecia) and in Switzerland, where the trucks will be initially operated. The Hyundai Hydrogen Mobility (HHM) joint venture, bringing together "H2 Energy" (Swiss company capable of manufacturing "green" hydrogen at the Aarau hydropower plant in Aargau) and Hyundai (Korean manufacturer producing hydrogen trucks) then aims to continue its activities in Europe, as well as the United States and Asia.
Project objectives Type of climate innovation of the project with a description of the problem/issue addressed	Through this project, Faurecia aims to **provide efficient hydrogen storage systems** (known as “type IV”, in composite) allowing the fuel to be stored in gas form at a pressure of 350 bars.
Detailed project description	This is the first scale-up of a fleet of zero-emission trucks, allowing the industrialization and use of hydrogen technology to be tested. Vehicles are leased by the Hyundai Hydrogen Mobility joint venture to H2 Mobility Switzerland players, bringing together the country's main fuel distributors (Avia, Migrol, Tamoil etc.), logistics companies, large distribution (Coop, Migros) and electricity manufacturers. Faurecia will supply the entire hydrogen storage system (including 10,000 hydrogen tanks) and it will be produced at its global center of expertise dedicated to this technology in Bavans, France. The first delivery is scheduled for 2021. Over a period of four years, Faurecia will equip around 1,600 Hyundai heavy-duty vehicles, which will subsequently be delivered in Switzerland to Hyundai Hydrogen Mobility, a joint venture recently created by Hyundai and H2 Energy with the aim of becoming the spearhead of the hydrogen mobility in Europe. Electric vehicles powered by fuel cells (hydrogen) are a complementary alternative to battery electric vehicles. The autonomy and refueling time of the trucks with fuel cells should be equivalent to diesel trucks, without any emission. By 2030, it is estimated that 2 million new vehicles including 350,000 commercial vehicles will be equipped with fuel cell technology.
Main project's drivers for reducing the greenhouse gas emissions	

Reduction levers	**Details of the project’s associated aspects**
☐ Energy and resource efficiency (including behaviour)	
☒ Energy Decarbonisation	Replacement of using diesel by hydrogen for trucks powertrain
☐ Energy efficiency improvements	
☐ Improving efficiency in non-energy resources	
☐ Emissions absorption: creation of carbon sinks, negative emissions (BECCS, CCU/S, ...)	
☐ Financing low-carbon producers or disinvestment from carbon assets	
☐ Reduction of other greenhouse gases emission	

<table>
<tr><td>Emission scope(s) on which the project has a significant impact and quantification of GHG emission reductions per emission scope</td><td>
<table>
<tr><th></th><th>Aspects of the project contributing to the reduction of emissions by emission category</th><th>Quantification of associated GHG emissions by emission category

Please follow the quantification methodology used in the Afep guidelines.</th></tr>
<tr><td colspan="3">Reduction of the company's carbon dependency</td></tr>
<tr><td>Scope 1
Direct emissions generated by the company's activity.</td><td></td><td></td></tr>
<tr><td>Scope 2
Indirect emissions associated with the company's electricity and heat consumption.</td><td></td><td></td></tr>
<tr><td>Scope 3
Emissions induced (upstream or downstream) by the company's activities, products and/or services in its value chain.</td><td></td><td></td></tr>
<tr><td colspan="3">Increase of carbon sinks</td></tr>
<tr><td>Emissions Absorption
Carbon sinks creation, (BECCS, CCU/S, …)</td><td></td><td></td></tr>
<tr><td colspan="3">GHG emissions avoided by the company at third parties</td></tr>
<tr><td>Avoided Emissions
Emissions avoided by the activities, products and/or services in charge of the project, or by the financing of emission reduction projects.</td><td>Replacement of the use of diesel by hydrogen for the powertrain of the trucks of Faurecia's partner</td><td>- 0,8 MtCO2eq</td></tr>
</table>

Details on the calculation or other remarks: The calculation was made with comparison with an equivalent diesel fleet
- diesel truck: 30L/100km at the rate of 2640g CO2/L of diesel = 79.2kg CO2/100km (estimated for the model in question by our design team with data provided by the manufacturer).
- 650.000 km lifespan (source Ademe[1]) => 0,5 kT of CO2 avoided by truck.
For 1,600 trucks this gives in order of magnitude 0.8 MtCO2 avoided for the project.
Fuel cell trucks being powered with green hydrogen in this project, the savings are 100% (in well to wheel).
</td></tr>
<tr><td>Modality of verification of the quantification.</td><td>Calculation standard used (ADEME base, GHG protocol, etc.): ADEME

Verification of the calculation (internal or external): INTERNAL</td></tr>
<tr><td>Other environmental and social benefits of the project</td><td>This project also contributes to the following SDG:
• SDG 7 Clean energy at a sustainable cost: no rejection of fine particles, noise reduction
• SDG 13 Measures relating to the fight against climate change: reduction of greenhouse gas emissions
• SDG 17 Partnership with the manufacturer and users.</td></tr>
<tr><td>Project maturity level</td><td>☐ Prototype laboratory test (TRL 7)
☐ Real life testing (TRL 7-8)
☐ Pre-commercial prototype (TRL 9)
☐ Small-scale implementation
☒ Medium to large scale implementation

Remarks: Click here to enter the maturity level of the project</td></tr>
<tr><td>Capacity and conditions of the project reproducibility, with associated climate impact mitigation potential</td><td>Storage systems can be adapted for the needs of other truck manufacturers around the world.</td></tr>
<tr><td>Amount of investment made (in €)</td><td>This project is part of Faurecia's € 200M investment in hydrogen.</td></tr>
</table>

[1] https://www.bilans-ges.ademe.fr/documentation/UPLOAD_DOC_FR/index.htm?transport_routier_de_marchandi.htm
Categories > 21,1t, <32,2t.

Economic profitability of the project (ROI)	☐ ST (0-3 years)
	☒ MT (4-10 years)
	☐ LT (> 10 years)
	
	Remarks: It is possible to decline different returns according to the different stakeholders of the project:
	• Project designer: Faurecia
	  ○ Today: Approval of parts corresponding to a customer request.
	  ○ 2021: tank production.
	  ○ MT/LT: feedback to improve products and their environmental performance
	• User: HKMC truck manufacturer
	  ○ Today: Identification of truck behavior in real use
	  ○ ST: integration of tanks and establishment of the organization of the value chain of vehicle use, and of the maintenance chain

Engaged partnerships	Different partners working for the success of this project: • Faurecia: supplies hydrogen storage systems • HKMC: manufactures hydrogen trucks • The Hyundai Hydrogen Mobility (HHM) joint venture, bringing together H2 Energy and Hyundai: offers a turnkey mobility solution • H2 Mobility Switzerland: leases hydrogen trucks and operates them
Open comments from the project owner	Over the next ten to fifteen years, fuel cell electric vehicle technology will play an important role in powertrain supply, particularly in the commercial vehicle segment. Faurecia is investing significant resources in order to optimize the potential of this technology and create the ecosystem most conducive to accelerating its deployment. This project, like the joint venture that Faurecia has created with Michelin to offer a unique range of fuel cell systems, is a major step in its ambition to become the leader in hydrogen systems for commercial vehicles.
To find out more about the project	
Contact the company carrying the project	Faurecia Sustainability ➔ sustainability@faurecia.com
Project URL links	Faurecia: https://www.faurecia.com/en/newsroom/faurecia-wins-major-award-hydrogen-storage-systems-hyundai-trucks Hyundai: https://www.news.hyundai.ch/la-livraison-par-hyundai-motor-de-xcient-fuel-cell-trucks-en-suisse-annonce-lexpansion-de-ses-camions-sur-les-marches-mondiaux# Hyundai Hydrogen Mobility (HHM): https://hyundai-hm.com/en/ H2 Mobility Switzerland: https://h2mobilitaet.ch/en/
Illustrations of the project	 Video: https://youtu.be/HD86U7akY4w