

H2Haul

Paving The Road For a
Carbon-Neutral Europe



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Co-funded by
the European Union





NextETruck mid-term conference

21st February 2024

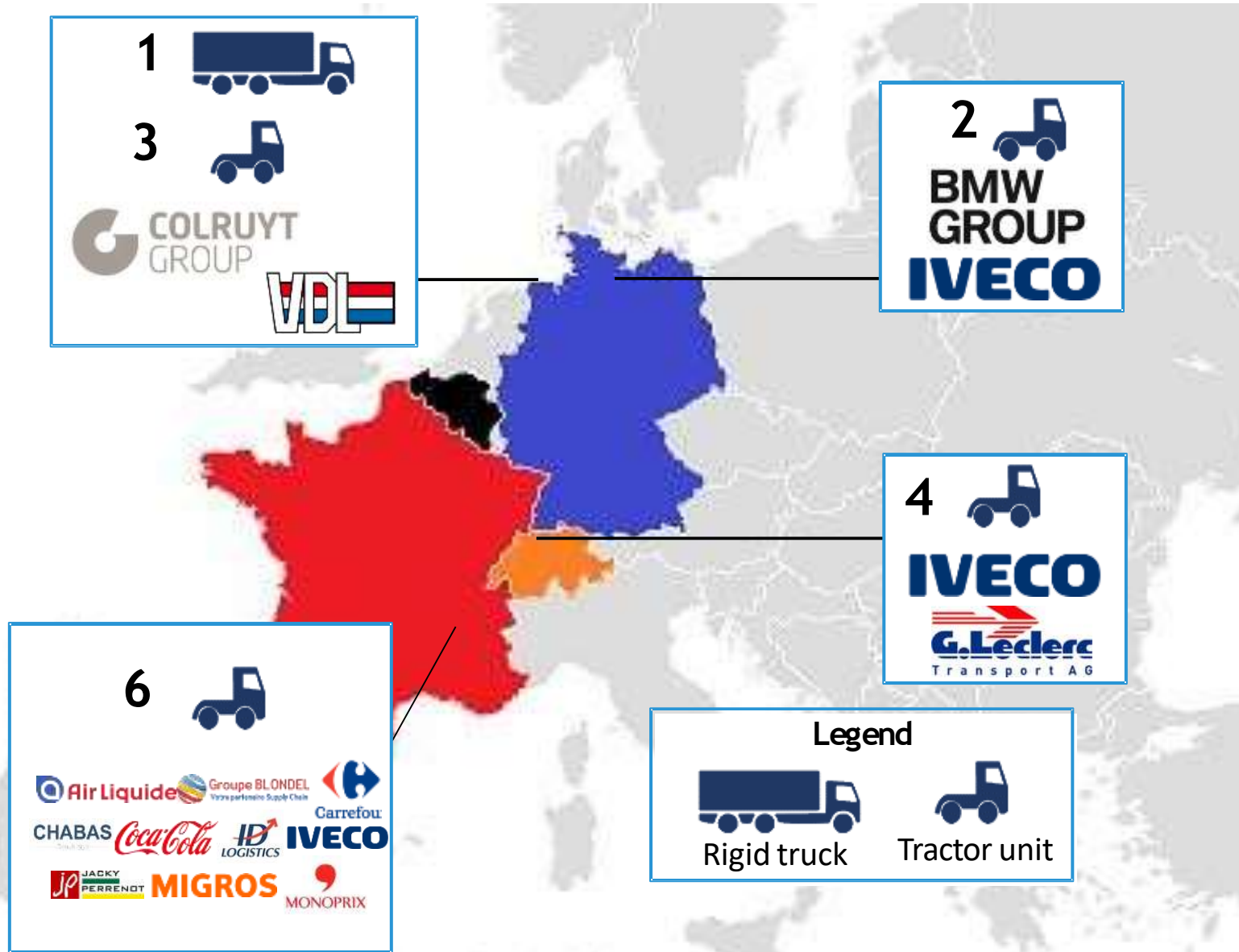
Ted Zotos



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H2Haul: deploying 16 heavy-duty trucks across four European countries



Objectives

- Develop long-haul heavy-duty (26-44t) fuel cell trucks that meet customers' requirements in a range of operating environments
- Homologate three fuel cell truck types
- Install hydrogen refuelling infrastructure at each site and provide high reliability hydrogen supplies that maximise environmental benefits
- Achieve >2 million kilometres of day-to-day driving, proving the viability of the technology
- Monitor the performance of the vehicles and infrastructure to provide evidence on the availability, efficiency, and environmental benefits
- Develop the business case to prepare the European market for further roll-out of fuel cell trucks

Vehicle, component, and infrastructure suppliers



Coordination, dissemination & analysis



Observer Group





H2Haul partners



Coordination, dissemination, analysis



Belgian deployment



Truck operator and
HRS provider

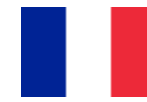


Truck manufacturer



FC supplier

French deployment



Truck operators



HRS provider



Truck manufacturer



FC supplier

German deployment



Truck operator



HRS provider



Truck manufacturer



FC supplier

Swiss deployment



Truck operator



HRS provider



Truck manufacturer



FC supplier



Delivery Phases



Specification of **truck requirements** and customisation or **build of vehicles**.



Assessment of proposed HRS sites. **Preparation** or expansion of **HRS**.



Launch of hydrogen fuel cell vehicles. Commence **real world operations** and maintenance. Scale-up of tests to **challenge performance** capabilities.



Continuous **collection, monitoring** and **analysis** of operational data, controlled in line with the **data management** principles.



Evaluation of performance and results. **Sharing of information** to consortium partners and selected end users throughout the project to leverage **learnings and best practices** to influence future developments.



Key progress includes

- ➔ Development of fuel cell truck specifications & designs
- ➔ Work on functional prototype fuel cell systems integrated into the trucks for testing
- ➔ Truck construction, testing & homologation activities ongoing and undergoing final stages prior to delivery to customers and operation late 2023/early 2024
- ➔ Official opening of the IVECO Ulm manufacturing site
- ➔ Unveiling of the H2Haul FC trucks at the IAA (IVECO in 2022, VDL in 2023)
- ➔ IVECO and VDL trucks showcased at European Hydrogen Week



IVECO
GROUP



VDL



VDL



H2Haul: The IVECO truck



Key progress includes:

- Development of fuel cell truck specifications & designs
- Work on functional prototype fuel cell systems integrated into the trucks for testing and vehicle validation
- Unveiling of the H2Haul trucks at the IAA in 2022
- Validation prototypes manufacturing and testing
- Homologation activities ongoing prior to delivery to customers and operation from 2024
- Customers for field test identified:
 - Germany (2 vehicles): BMW /DHL
 - Switzerland (4 vehicles): Leclerc
 - France (6 vehicles): Air Liquide, Perrenot, ...







H2 Haul vehicles in the manufacturing line



H2Haul: the VDL truck



Belgian deployment	
Fuel cell supplier	 PLASTIC OMNIUM
HRS provider	
Manufacturer	
Shipper	



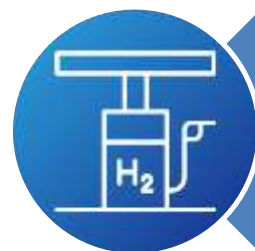
3 VDL tractors + 1 VDL rigid truck –
Min. 30,000 km/year per truck.



The trucks will be operated by Colruyt group and based at one of the distribution centres in Belgium.



The trucks will distribute goods between the distribution site and retail sites.



A new hydrogen refuelling station for heavy duty vehicles, at 350 bar, will be built in Ollignies (B).



VDL Prototype Truck 44t0
2x FCM50 (A-Sample), 40kg/350bar H2 Tank System, 210kWh Battery

- 2x 44t Tractor unit
- 210 kWh Battery
- 4x50kW Fuel Cell (EKPO)
- 40 kg H2 Storage
- H2 Range: 400km
- 350 Bar
- Newly developed within H2Haul



Rothenburg

In operation since 2021

Refuelling trucks at 350 bar



Fos-sur-Mer

In operation since 2023

Refuelling trucks at 700 bar



Ollignies

In operation since 2023

Refuelling trucks at 350 bar



Nuremburg & Leipzig

Under development, expected commissioning 2024

Refuelling trucks at 700 bar



Risks and Challenges:



Lessons Learned:

- Collaboration with other industry projects is essential:

PRHYDE	IMMORTAL	STASHH	AEVETO
Refuelling protocol	Durability and lifetime of heavy-duty FC stacks	Standardisation of FC modules for heavy-duty	Cluster of EU electric and H2 heavy-duty truck projects

- Divergent country-specific HRS planning/permitting procedures and approvals
- Built-in HRS redundancy enables stable freight operations
- High utilisation a key component for heavy-duty business case





The final years of H2Haul will support the wider development of the sector in the late 2020s and beyond



Activities until the end of the project

H2Haul truck deployment in 2024 and collection of operational data



Extensive analysis on operational data, including life cycle cost (LCC) and well-to-wheel (WTW) reports



Final project outputs including report on further deployment plans and commercialisation pathways



Dissemination to targeted stakeholder including dedicated Observer Group, dissemination to policy-makers and final H2Haul project event



Expected Impact & Further Developments

Direct emissions reduction for H2Haul trucks replacing diesel in four countries

Validation of hydrogen as a viable zero-emission alternative to diesel in everyday logistics operations

Analysis and reports to provide sectoral and policy recommendations for further roll-out across Europe

Collaboration across projects including the next generation of EU heavy-duty hydrogen truck projects, such as H2Accelerate TRUCKS



Liaising with other projects – The H2Accelerate TRUCKS project

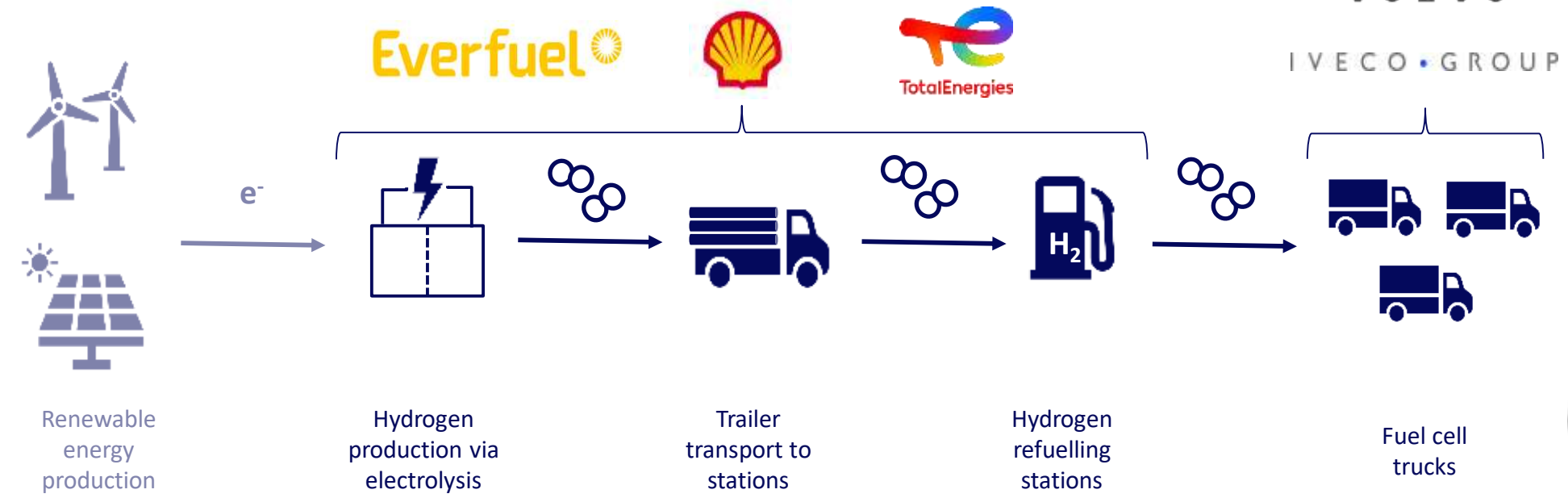


Coordination, research and dissemination partners

SINTEF **VTT** **RU** **UNIRE**

elementenergy **WKO** **FIAP**

H2Accelerate
TRUCKS





Liaising with other projects - The ZEFES project



- ↔ 15 demonstrations
 - ↔ 9 BEVs & 3 FCEVs (EMS 1 & 2) and fast charging concepts
 - ↔ intermodal and cross border
 - ↔ 15 months under real conditions (Q2/2025 - Q2/2026)
 - ↔ >1Mio kilometers of data





77.3% of goods transported in the EU by road (by weight/tkm)

- Approx. **90%** of the total value

From 2015 to 2050, a growth of **50%** is forecasted



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www.h2haul.eu



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