



# SAFRA

## Press release

Montpellier, Toulouse, April 17, 2024

### Launch of France's 1<sup>ère</sup> fleet of retrofitted hydrogen-powered buses

The people of the Occitanie region will be the first in France to be able to travel in green hydrogen-powered coaches on daily routes. On Wednesday April 17, in Albi, Carole Delga inaugurated the first two green hydrogen-powered, CO<sub>2</sub>-free buses retrofitted<sup>1</sup> by the Safra company, in the presence of Michel Vilbois, Prefect of the Tarn department, Christophe Ramond, President of the Tarn department, Stéphanie Guiraud-Chaumeil, Mayor of Albi, and Vincent Lemaire, President of Safra. They are the first in a series of 15, all of which will be commissioned before the end of the year.

As part of the European Corridor H2 project, which aims to decarbonize passenger and freight transport on a massive scale, **the Occitanie Region has undertaken to convert 15 diesel coaches into coaches powered by green hydrogen.** The project was made possible by the "H2-PACK®" kit designed by Safra and its employees in Albacete, and supported by Ademe as part of the France 2030 program. **This revolutionary technology makes it possible to extend the life of diesel vehicles already in service, by making them completely carbon-free, since they emit only water vapor.** This means they can also be used in Low Emission Zones (ZFE). Six tanks contain 35 kg of green hydrogen, giving the bus a range of up to 500 km. **The first two retrofitted coaches will be put into service by the Occitanie Region by the end of April, on liO routes 702 and 709 linking Albi, St-Sulpice and Lavaur.** A further 13 retrofitted hydrogen-powered coaches will be put into service in Occitanie by the end of the year. **The Region has committed €7.2 million to this project.**

Carole Delga: *"It's in Occitanie that the first passengers will be travelling on daily routes in retrofitted hydrogen coaches! This is a source of pride for the region and for the employees of Safra, the company behind the H2-Pack technology, which enables 15 diesel buses to be converted into hydrogen-powered coaches, giving them a second life.*

*To reconcile the decarbonization of mobility and the reindustrialization of Europe, public authorities need to show confidence in their industry by investing massively. By securing the first orders, local authorities, the State and Europe will enable new industrial sectors to emerge and stabilize their economic model, before opening up to new international markets. If we don't, other countries will do it for us. Jobs and added value will then be created on other continents.*

*The proactive Occitanie region is fully assuming this role, creating green jobs for the future in its region.*

**[Below you'll find a press release on the development of green hydrogen in Occitanie, plus photos \(photo credit: Région Occitanie\): https://we.tl/t-ZEUKxsHUXG](https://we.tl/t-ZEUKxsHUXG)**

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<sup>1</sup> Retrofit: Operation consisting of replacing a vehicle's combustion engine by changing the technology.

# H2-PACK

Hydrogen powered by SAFRA



**CERTIFIED**

Electrical conversion device approval

n°PA-0010-24-00

Our H2-PACK® kit is supported by ADEME as part of the France 2030 investment plan.



**RÉPUBLIQUE  
FRANÇAISE**

*Liberté  
Égalité  
Fraternité*



# RETROFIT CONTRACT COACH H2 OCCITANIE

## PUBLIC CONTRACT FOR CURRENT SUPPLIES AND SERVICES

3 phases :

Production of 2 prototypes and 1 production model

Production of 6 vehicles

Production of 6 vehicles

Maintenance :

H2 powertrain maintenance

## CLIENT



## OPERATOR



Main features of the contract :

Maintenance period: 7 years from acceptance

Warranty period: 2 to 7 years

## EXPERIMENTAL PROJECT ENTRUSTED TO SAFRA BY THE OCCITANIE REGION FOR THE RETROFIT OF 15 DIESEL COACHES

Experimental project entrusted to Safra by the Occitanie Region for the retrofit of 15 diesel coaches

Work :

Replacement of the thermal drive train with a 100% electric drive train powered by a hydrogen fuel cell.

Target performance :

Range: 300 to 500 km

Maximum speed: 100 km/h

Ideally, use of technical areas without encroaching on luggage areas

Increased power demand for variable payloads and high speeds on motorways

Maintain thermal comfort conditions in summer and winter without any appreciable reduction in range

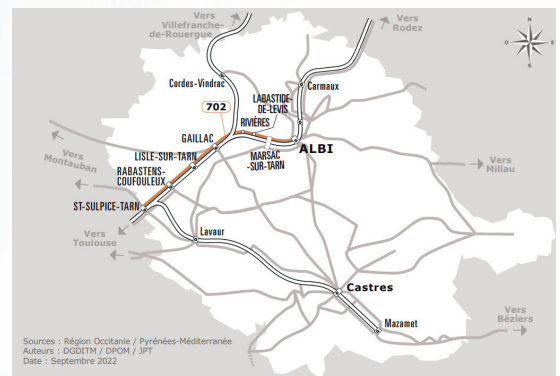
## Vehicles :

Mercedes Intouro ME  
euro V - 2012



## Operation :

Ligne 702 Albi <-> St Sulpice (highway or main road)



**H2-PACK**

Hydrogen powered by SAFRA

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# 1. Introducing SAFRA

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SAFRA, a French company founded in 1955, is a pioneer in hydrogen mobility and a long-standing player in the renovation of passenger transport equipment. The company's strategy is aligned with environmental, social and sovereignty issues, with the aim of accelerating the energy transition through the sustainable decarbonization of transport in Europe.

The company is based in Albi, France, on an 8.5-hectare site, with 11,000 m<sup>2</sup> of covered buildings, and currently employs over 205 people, all based at the Albi site.

With around twenty vehicles on order, the company is continuing to grow in order to ramp up production, by expanding its facilities and continuing to recruit this year, to reach a production capacity of 25 vehicles in 2024, 60 in 2025 and 120 in 2026.

SAFRA's mission is to accelerate decarbonized mobility. The company's entire strategy is geared in this direction.

All the products and services offered by SAFRA are designed to meet the needs of Mobility Authorities in their efforts to decarbonize their fleets.

SAFRA is committed to a CSR (Corporate Social Responsibility) approach that is an integral part of its Quality policy (QRSE policy), supported by 3 commitments: environmental, societal and economic.

CSR is the very foundation of SAFRA's corporate project, which is built around 3 values:

- Integrity and benevolence,
- Commitment to sustainable development,
- Optimistic ambition based on innovation.

The company is ISO 9001 and ISO 14001 certified.

## **2. Converting polluting vehicles to zero-emission**

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### **2.1. Retrofit principle**

Nearly 70 years' experience in the renovation of transport equipment, combined with over 10 years' know-how in hydrogen-powered electric motors, have enabled SAFRA to work on a vast program to convert diesel vehicles into hydrogen-powered vehicles.

The company's first retrofit project focused on intercity coaches. These vehicles, which are used for long-distance journeys, need a very long range, while still being able to carry passengers and luggage. Hydrogen is a highly relevant solution for this application. What's more, there are currently no zero-emission vehicles on the market.

Retrofitting coaches is also perfectly in line with a sustainable development policy that extends vehicle life while reducing greenhouse gas and particulate emissions to zero, i.e. 106 kg of CO<sub>2</sub> avoided per 100 km. The perfect answer to sustainable mobility.

### **2.2. A government-backed innovation program**

SAFRA's H2-PACK® hydrogen retrofit kit is supported by ADEME as part of the France 2030 investment plan. The innovation program to produce the first retrofitted vehicles required 3 years of R&D.

The French Environment and Energy Management Agency (ADEME) has allocated a 4.8 million euro aid package, of which a first instalment of 700,000 euros has been paid to the company. The company has just completed 2 of the 5 lots planned under the SAFRA H2 program.

The SAFRA H2 program comprises 5 lots, enabling the development of 5 new hydrogen vehicles, virtually non-existent on the market today. SAFRA intends to develop, test and validate 5 innovative powertrains, with a particular focus on autonomy, power and recharging. In this way, SAFRA aims to consolidate its position in France and expand its European presence in the clean bus and coach market. The company also intends to boost the competitiveness of the French hydrogen industry.

## 2.3. Introducing the H2-PACK® retrofit kit

The H2-PACK® retrofit kit is entirely designed and assembled by SAFRA. The kit enables the vehicle's diesel engine to be converted to a zero-emission hydrogen-electric powertrain. The combustion engine is replaced by a



A 350 kW DANA electric motor powered by a Plastic Omnium 100 kW fuel cell (70 kW useful). Hydrogen is stored in 6 tanks, enabling 35 kg of hydrogen to be carried on board, for a range of up to 500 km. The tanks have been cleverly integrated into an area separated from the passengers by a watertight, ventilated and secure partition, in order to comply with vehicle size regulations.

Retrofitting is of major interest, as it accelerates the decarbonization of mobility by transforming the current fleet, at a time when the new vehicle offer is not yet sufficiently developed. Its cost is much lower than the purchase of a new hydrogen vehicle, and retrofitting is also part of a circular economy approach, as it extends the vehicle's lifespan. These vehicles are often only 7 years old, and their only drawback is that they comply with the Euro 5 standard. The replacement of the vehicle is thus postponed by several years, and the same vehicle can finally circulate in Low Emission Zones (ZFE) on which it could not previously circulate.

This kit transforms the engine of a diesel coach into a zero-emission vehicle running on hydrogen and emitting only water vapor.

The result of initial experimental work carried out on 15 2012 Mercedes Intouro ME coaches belonging to the Occitanie region, these hydrogen retrofit kits have been offered for sale since 2023.

Integrating this retrofit kit means replacing the internal combustion powertrain with a 100% electric powertrain powered by a hydrogen fuel cell.

The main stages involve :

- Engine / tank removal
- Building a new energy chain, in compliance with regulatory constraints
- Connection to the existing traction chain
- Integration of new calculators and software
- Interfacing with existing equipment
- And to complete the homologation of conversions in accordance with the technical and administrative provisions of the decree of March 13, 2020.

The retrofit kit has now been approved, and SAFRA has the capacity to carry out the hydrogen retrofit of the first series of vehicles in industrial mode.



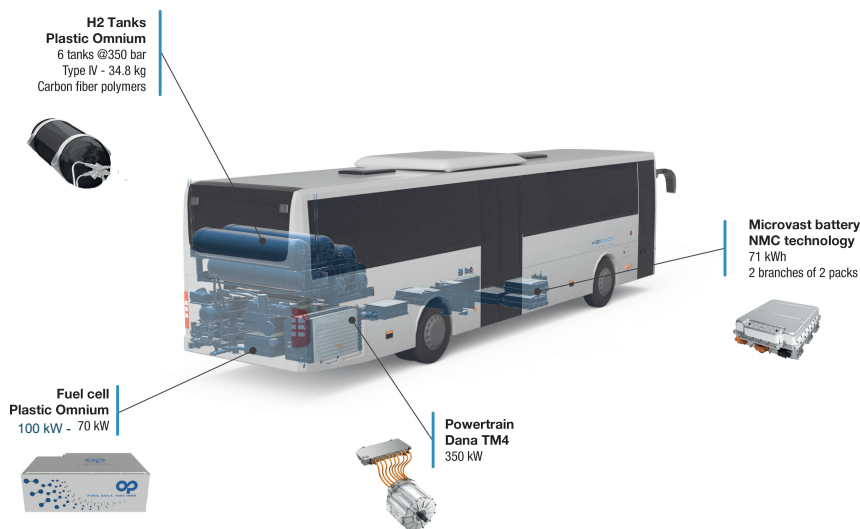
Vincent Lemaire, President of SAFRA, comments on the retrofit, "SAFRA, a specialist in passenger transport equipment for over 65 years, is a hydrogen pioneer fully integrated into the ecosystem. SAFRA is a manufacturer of hydrogen vehicles with over ten years' experience of the technology and its effective safety conditions, and has made the strategic choice of offering its customers an opportunity to accelerate the decarbonization of their fleets through hydrogen retrofitting.

SAFRA is also the only company to offer an H2 retrofit kit for the Mercedes Intouro coach, the bestseller on the European coach market.

## 2.4. Technical specifications

The H2-PACK® kit integrates a 350 kW electric motor, a 71 kW NMC battery and a 100 kW fuel cell, all supplied by 6 type 4 plastic Omnium H2 tanks storing 35 kg of hydrogen at 350 bar.

Installation of the retrofit kit gives the vehicle a range of up to 500km at a maximum speed of 100km/h. The vehicle's dimensions remain strictly unchanged, in line with regulations, and thermal comfort is also guaranteed in summer and winter.



- Range up to 500 km
- Maximum speed 100 km/h
- Maintain summer/winter thermal comfort conditions
- Vehicle gauge strictly unchanged in accordance with regulations
- 350 kW electric motor
- 71 kWh NMC batteries



- Fuel cell 100 kW PEM
- Hydrogen storage 35kg, 350 bar and type 4 tank.