

## Press kit



**busworld.**

EUROPE BRUSSELS  
7-12 OCT 2023



Press contact:

Emmanuelle Saux - e.saux@safra.fr - +33(0)683 558 787

# Contents

- 1. Press release ..... 3
- 2. Company presentation ..... 4
- 3. Solutions for low-carbon mobility ..... 5
- 4. SAFRA Bus ..... 7
  - 4.1. Sleek new design ..... 7
  - 4.2. Passenger experience..... 8
  - 4.3. Driver's cab ..... 10
  - 4.4. Technical data..... 11
  - 4.5. Controlling vehicle data security ..... 12
- 5. SAFRA Services..... 14
  - 5.1. Extending the service life of transport equipment ..... 14
  - 5.2. Converting polluting vehicles to zero-emission vehicles ..... 16
    - 5.2.1. Retrofit principle..... 16
    - 5.2.2. H2-PACK® retrofit kit..... 16
    - 5.2.3. Technical specifications ..... 17
  - 5.3. Providing comprehensive customer service..... 18
    - 5.3.1. Fleet management with VHYSION®. .... 19
  - 5.4. Recruiting and training future employees ..... 19
- 6. SAFRA Solutions..... 21
- 7. Technical datasheets ..... 22

---

Press contact:

Emmanuelle Saux - e.saux@SAFRA.fr - +33(0)683 558 787

# 1. Press release

---

## SAFRA unveils HYCITY® at Busworld 2023

- SAFRA, a major player in the decarbonization of passenger transport, and a pioneer of hydrogen mobility in France, unveils generation 2 of its hydrogen bus: HYCITY®.
- SAFRA chose to exhibit this new vehicle for the first time at Busworld, Europe's leading event for passenger transport.
- It will then be exhibited at the Rencontres Nationales du Transport Public (RNTP), the national event taking place this year in Clermont-Ferrand from October 17 to 19.

Albi, 07/10/2023

HYCITY®, the latest generation of hydrogen-powered buses manufactured by SAFRA, is being unveiled for the first time at the Busworld trade show, taking place in Brussels from October 7 to 12. This is an opportunity to present this brand-new model, which replaces its predecessor, the Businova®, to all those involved in passenger transport.

Benefiting from unprecedented feedback from the only manufacturer of a 100% French hydrogen vehicle, using the latest technologies and with a sleek design, offered in 2 and 3-door versions with a low and flat floor, this bus completes the catalog of solutions around decarbonized mobility offered by the company, including the H2-PACK® hydrogen retrofit kit, which enables diesel coaches to be converted into zero-emission vehicles.

SAFRA is also showcasing its solutions and services for decarbonizing transport, such as its fleet management tool, VHYSION®, its full maintenance services, and its expertise in extending the service life of passenger transport vehicles.

The SAFRA stand, number 955 in Hall 9, is dedicated to sustainable mobility, and welcomes HYCITY® for its first exhibition.

"We can't wait to show the public transport community our new vehicle. This show is a great opportunity to highlight the company's strategy, which has always focused on low-carbon mobility, through this flagship product. We're very proud to be able to present it at Busworld 2023, surrounded by bus manufacturers from all over the world" declared Stéphane Prin, CEO of SAFRA.

## 2. Company presentation

---

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.

# 3. Solutions for low-carbon mobility

For several years, SAFRA has been developing a range of products and services to support Mobility Organizing Authorities in the maintenance and management of their transport fleets, and in the decarbonization of their fleets.

From new zero-emission products to high-maintenance services, SAFRA has expanded its offering to include services such as fleet management, vehicle appraisal, retrofitting and, more recently, financing and hydrogen production, through solid partnerships.

SAFRA's carbon-free mobility offer provides customers with a comprehensive range of products and services to simplify the process, with the aim of accelerating the decarbonization of transport.

It is organized into three main activities:



SAFRA BUS	SAFRA SERVICES	SAFRA SOLUTIONS
<p><b>SAFRA BUS</b></p> <div style="display: flex; justify-content: space-around;"> <div>  <p>HYCITY H2 12m &amp; 18m</p> </div> <div> <p>HYCITY</p> </div> </div> <div style="display: flex; justify-content: space-around;"> <div>  <p>HYCITY FE 12m</p> </div> </div>	<p><b>SAFRA SERVICES</b></p> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Engineering, Expert Assessment</li> <li>• Refit</li> <li>• Life cycle extension</li> </ul> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>Hydrogen Retrofit Coach and Truck</p> </div> <div> <p><b>H2-PACK</b> <small>concept powered by SAFRA</small></p> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <p>Electric Retrofit Bus and coach</p> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Fleet &amp; TCO management</li> <li>• Technical support</li> </ul> </div> <div> <p>CUSTOMER SERVICE</p> </div> <div> <p><b>VHYSION</b></p> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Full maintenance</li> <li>• Spare parts</li> </ul> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Safety &amp; regulation support</li> <li>• Training</li> </ul> </div> <div> <p><b>SAFRA ACADEMY</b></p> </div> </div>	<p><b>SAFRA SOLUTIONS</b></p> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Lease (zero emission vehicles)</li> <li>• KAaS</li> </ul> </div> </div> <hr/> <div style="display: flex; justify-content: space-between;"> <div>  </div> <div> <ul style="list-style-type: none"> <li>• Energy</li> <li>• H2 storage &amp; distribution</li> </ul> </div> </div>

*Decarbonizing transport is a major challenge if we are to meet French and European regulations on climate change quickly and easily.*

*31% of greenhouse gas emissions in France are produced by the transport sector (buses, cars, trucks), and 63% of NOx emissions come from diesel road transport. To achieve the decarbonization of land transport by 2050, various laws and decrees have introduced criteria and quotas to ensure that only zero-emission vehicles are offered by 2030 for urban transport.*

Stéphane Prin, SAFRA's Managing Director, explains, *"We have put in place a complete mobility offering, with the aim of simplifying and facilitating the procedures for our customers, to rapidly decarbonize their fleets. Accelerating our customers' energy transition by offering them a range of solutions for zero-emission mobility is our mission and the cornerstone of our strategies.*

*Through strong partnerships, we offer a comprehensive service that sets us apart. We are the only player to offer new vehicles to meet our customers' acquisition needs, retrofitting to convert existing thermal vehicles into zero-*

*emission vehicles without having to replace them completely, and refurbishment to extend vehicle life. The operational tool we offer is designed for Mobility Organizing Authorities and private operators seeking sustainable mobility solutions. Our global offer, which covers all our activities, enables us to offer a 360° service to our customers".*



## 4. SAFRA Bus

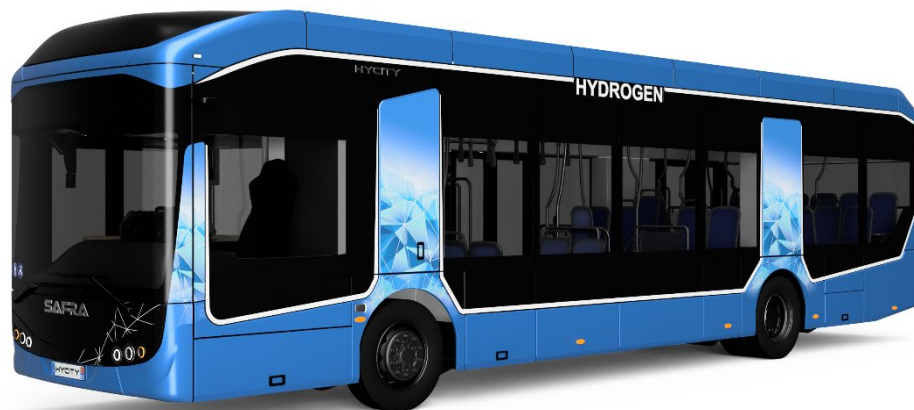
---

SAFRA Bus designs, engineers, manufactures and fully tests the buses of tomorrow's mobility. HYCITY® is currently available in a hydrogen version, and will soon be developed in a fully electric version as well.

This vehicle benefits from feedback from its predecessor, the BUSINOVA® H2, in operation since 2018 and present on several French networks (Lens, Versailles, Le Mans, Auxerre, Lyon) and 1 airport (Toulouse-Blagnac).

Numerous elements have been integrated into the design of this new generation of vehicles, such as optimizing the powertrain, standardizing the vehicle structure and integrating industry-proven components.

It is currently the only hydrogen bus manufactured in France, entirely designed and assembled by SAFRA at its Albi site, and also the only vehicle to feature a French fuel cell, developed and marketed by SYMBIO, a company owned equally by Faurecia, Michelin and Stellantis.



### 4.1. Sleek new design

The advantages of the new generation of hydrogen buses, HYCITY® :

- Increased comfort, in terms of accessibility, fluidity and space-saving, all in a modern, luminous interior.
- A strong, personalized design that blends in perfectly with the city
- A technological breakthrough in powertrain and vehicle performance

The design of the HYCITY® takes up the codes of today's buses, while giving it a more distinctive, modern language and shapes. It is the perfect alliance between the classic, tried-and-tested look of this generation's buses, and the futuristic, visionary lines of future bus generations. A vehicle totally focused on tomorrow's mobility.



The vehicle's front end is resolutely modern and uncluttered. The old, bouncy curves have been replaced by stylized, finely drawn lines, highlighting the lights and the SAFRA brand, which now appears in massive letters on the grille. The large front opening is framed by 2 columns that echo those on the sides. These successive columns create the HYCITY®'s distinctive line, and lightly support the equally distinctive roofline. At the front, too, an emblematic, slightly domed front end gives the HYCITY® its dynamic, high-performance style.

The more restrained rear of the vehicle has been designed for functionality, with a technical trunk providing access to the battery, as well as for passenger comfort, with exceptional wide-glazed windows that bring in plenty of natural light.

## 4.2. Passenger experience



The passenger experience was integrated into the HYCITY® design from the outset, taking into account passenger needs and expectations in the specifications.

Particular attention has been paid to the fluidity of movement inside the vehicle. This new generation benefits from a full flat floor, facilitating passenger circulation and reducing waiting times at stops, which helps to increase commercial speed, another attractive feature of urban transport networks. Boarding is via 3 wide



tram-type doors to facilitate passenger flow. This new architecture saves 8% more space than its predecessor, Businova.

The use of recycled materials or, for example, wood in the passenger compartment, standard on HYCITY®, enhances the quality perceived by passengers (wicket door shelf, front column shelves). Accessibility has not been forgotten either, with several UFR and PMR zones inside, customizable on request, and incorporating an electric or manual ramp at the central door.



On the day side, the lighting ambience created on this new model contributes to the creation of an environment conducive to travel. HYCITY® benefits from natural light, while taking into account the integration of imposing components such as the hydrogen tanks. However, climatic comfort has not been neglected, with a high-performance heat pump on the roof to maintain a comfortable temperature throughout the cabin in both summer and winter. Inside, large glass surfaces provide not only natural lighting, but also panoramic views of the cityscape. A large rear window has been retained, as there is no engine in this area, increasing not only the brightness of the space, but also sound comfort, as no engine noise disturbs the journey.

At night, the lighting ambience is created with fully customizable LED lighting, with a night mode to avoid dazzling. SAFRA's teams can customize these lighting moods at the request of each network, to create unique moods and preserve the identity of an existing graphic charter, thus creating a sense of belonging.

The use of a motorized axle also significantly reduces noise emissions. What's more, this type of motorization generates no jolts or vibrations, reducing the risk of noise pollution.



### 4.3. Driver's cab

The driver's station received the same attention as the HYCITY® design and architecture overhaul. This workstation requires a number of criteria to be met in order to make it practical and ergonomic, while respecting the usual codes appreciated by drivers.

First and foremost, the driver's seat, the centerpiece of this operator station, has been selected from top-of-the-range references to ensure comfort and safety throughout the day. Equipped with a swivel base, it has been designed to make it easier for the driver to get in and out of the seat.

All around the driver, the integration of the various components has been designed to make every gesture easy and intuitive. More storage compartments have also been integrated into the cockpit. The access door, with its electromagnetic closing system, provides the driver with added safety, thanks to a glass partition that can be activated from the driver's seat, and eliminates all vibrations.

The vehicle's controls have all been designed for enhanced accessibility, fitting perfectly into the driver's field of vision so that everything is within easy reach. The latest-generation dashboard boasts both technological and design innovations, with a central screen that has been completely reworked to make it easier to monitor driving data and support the driver throughout the day.

Thanks to the redesigned overall architecture, the HYCITY® windscreen offers wider visibility, while the elevated driving position provides a commanding view of the road, making driving more efficient and customer reception safer.



Traditional rear-view mirrors have been replaced by a cleverly integrated rear-view system on each side of the upper body opening. The driver can keep an eye on traffic via the 2 video screens integrated into the front of the cabin, for an all-round view in a single glance. On each screen, 2 camera angles are displayed: the angle of the conventional rear-view mirror, which takes up 2/3 of the screen and gives a view of the traffic on its side, and a wide-angle view on the lower part of the screen, which fills in the blind spots.

Thermal comfort is ensured by a heat pump that guarantees the general temperature of the vehicle in winter and summer, with a complementary system on the driver's side to guarantee optimum driving conditions throughout the day.

Last but not least, driving the HYCITY® electric motor is a real source of well-being for the driver. No jerking or braking, the ride is smooth and gentle, to the delight of driver and passengers alike. The totally silent engine also contributes to reducing driver fatigue.

## 4.4. Technical data

HYCITY® features a 2 x 125 kW drive axle and a 130 kWh battery pack with NMC lithium cells.

The hydrogen section comprises a 45 kW fuel cell from Symbio. The fuel cell is fed by six tanks on the roof, which store 35 kilos of hydrogen at 350 bar.

- Electric drive axle 2 x 125 kW
- 130 kWh NMC batteries
- Fuel cell 45 kW
- Hydrogen storage 35kg, 350 bar - 6 type 4 tanks.
- Range up to 500 km
- Maximum speed 70 km/h
- Maintain summer/winter thermal comfort conditions
- Height: 3.30m
- Length: 11.857m
- Width: 2.55m
- Capacity: see locations



### Examples of installations



33 seats including 4 PMR + 1 UFR + driver in 2-door version



29 seats including 4 PMR + 2 UFR + driver in 3-door version

## 4.5. Controlling vehicle data security

Data protection is a highly sensitive issue, and one that SAFRA's teams take very seriously. Cybersecurity has been integrated into the HYCITY® (hydrogen buses) and H2-PACK® (hydrogen retrofit kits for intercity coaches) programs from the outset, to ensure that any behavior that could present a risk is controlled. The same internal rigor is demanded of the suppliers and service providers with whom the company works, with high levels of protection.

The HYCITY® program already complies with the requirements of the international R155 standard, and enables SAFRA to demonstrate not only its technical expertise in the world of low-carbon transport, but also its mastery of cybersecurity in connected vehicles, by working on the risks inherent in cybersecurity from



vehicle design and operation through to the end of the vehicle's life. The H2-PACK® program therefore inherits this perfectly controlled environment.

Finally, SAFRA joined the ITxPT (Information Technology for Public Transport) association as an associate member in January 2023.

The mission of the ITxPT association is to enable interoperability between IT systems in public transport by proposing the specification of a standards-based IT architecture with open interfaces for on-board, live and back-office IT systems.

The data uploaded to VHYSION follows ITxPT standards (TiGR format), enabling us to respond perfectly to the specifications imposed in calls for tender on vehicle data interoperability.



## 5. SAFRA Services

---

SAFRA Services encompasses all the services that support Mobility Authorities in decarbonizing and extending the lifespan of their existing fleets, as well as maintaining and optimizing their fleets.

- Nearly 70 years of expertise in repairing equipment and reconditioning vehicles to give them a second life. These include mid-life refurbishment services to extend vehicle life, expertise and major maintenance to keep the fleet in good operating condition,
- Retrofitting vehicles with hydrogen, using the H2-PACK® retrofit kit, and soon with electric power. The vehicles concerned are intercity coaches such as the Mercedes Intouro, on which the H2-PACK® kit has been developed, and heavy goods vehicles, in partnership with Hyliko.
- Full maintenance service, and fleet management with the VHYSION® supervision and fleet management tool for perfect TCO control.
- Support for regulatory and safety issues, as well as training for future employees, through our "SAFRA Academy" training center.

### 5.1. Extending the service life of transport equipment

The company's strategy is a continuation of the great adventure that began in 1955, when SAFRA was already working for more environmentally-friendly mobility, historically through the renovation and life extension of public transport equipment.

Over time, the Renovation business has diversified and developed into the provision of equipment, fittings and heavy maintenance services for urban passenger transport vehicles, as well as the renovation of buses, streetcars, metros and railcars.

With nearly 70 years' experience in this field, SAFRA is able to carry out any type of contract, from design and project management to full implementation, while also taking charge of the equipment, whether rolling stock or not.

The areas of activity are :

- Interior and exterior renovation
- Design, manufacture and assembly of body parts and complete systems
- Equipping special vehicles for reception or information services (information bus, cyber bus, health bus, eco bus, etc.).

- Converting standard vehicles into driver's vehicles with a skilled workforce.

In recent years, SAFRA has also diversified its activities towards the railway sector, and now carries out major maintenance work on heavy equipment, the renovation of complete bogie systems, as well as various studies and compliance work.

SAFRA helps its customers extend the life of their transport fleets and combat obsolescence of vehicles. SAFRA aims to promote circular mobility by encouraging the renovation of vehicles rather than their systematic replacement by new ones.

SAFRA works with urban transport networks throughout France (around 200), and is also targeting international markets (most recently Dublin).

Detailed areas of expertise :

- Interior and exterior renovation of passenger transport vehicles
- Design, manufacture and assembly of body components and complete systems
- Special vehicles to welcome and inform the public (info bus, cyber bus, health bus, eco bus, etc.).
- Technical and regulatory upgrades
- PMR-UFR accessibility
- Expertise
- Studies
- Major maintenance on railway equipment
- Renovation of the complete bogie system
- Powertrain renovation (engine, gearbox, etc.)
- Door system renovation
- Upgrading air-conditioning systems



\*(hors mécanique)

\*\* A titre indicatif, un VAL (métro automatique léger) neuf coûte environ 4 millions d'euros, un bus (GNV par exemple) coûte environ 350.000 € et un tramway coûte environ 4 millions d'euros.

## 5.2. Converting polluting vehicles to zero-emission vehicles

### 5.2.1. 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 purpose. 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.

### 5.2.2. H2-PACK® retrofit kit

The hydrogen retrofit kit designed and manufactured by SAFRA is registered under the H2-PACK® trademark.



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 homologation phase, which includes the final validation stages of the H2-PACK® kit, has now begun. Operational safety studies have already been carried out during the design phase. The completion of all safety tests, including passenger safety tests, is SAFRA's guarantee of quality and safety for its customers. As soon as approval is granted, SAFRA will be able to carry out the hydrogen retrofit of the first series of vehicles in industrial mode.





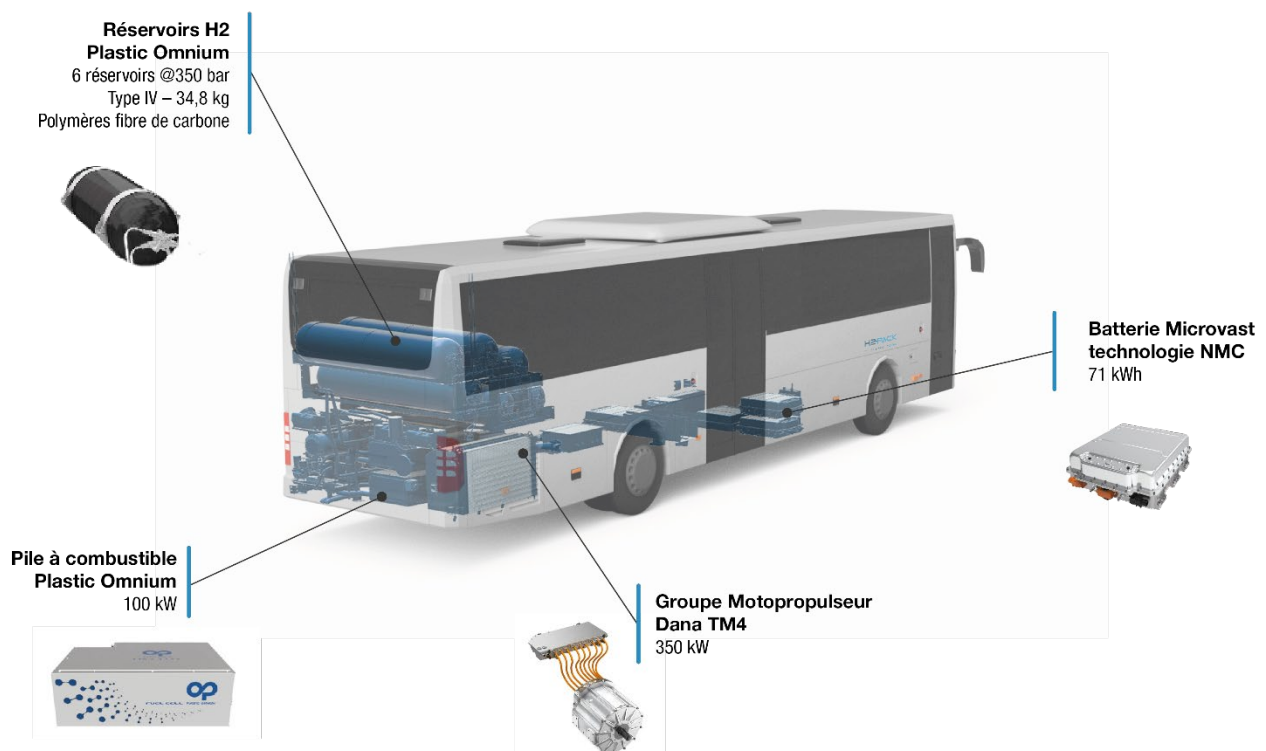
Commenting on the retrofit, Vincent Lemaire, Chairman of SAFRA, said: "SAFRA, a specialist in passenger transport equipment for over 65 years, is a hydrogen pioneer and a fully-integrated member of the ecosystem. SAFRA is a manufacturer of hydrogen vehicles with more than ten years' experience of the technology and its effective safety conditions, and has made the strategic choice of offering its customers the possibility of accelerating the decarbonization of their fleets through hydrogen retrofit. SAFRA is also the only company to offer an H2 retrofit kit adapted to the Mercedes Intouro coach, a bestseller on the European

coach market".

### 5.2.3. 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 Omnium plastic H2 tanks storing 35 kg of hydrogen at 350 bar.

Installation of the retrofit kit gives the vehicle a range of up to 500km with 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.

## 5.3. Providing comprehensive customer service

SAFRA has developed a service enabling it to offer maintenance services for its customers' hydrogen fleets.

The customer service department also specializes in optimizing the performance of passenger transport vehicles, thanks to a platform entirely designed and developed by SAFRA: VHYSION®, which helps customers manage their transport vehicle fleets.

Like any other urban mobility vehicle, the full hydrogen bus requires both preventive and corrective maintenance. The vehicle's chassis, brakes, compressed air and electrical systems, doors and many other components are identical in every respect to what is known in the industry and maintained in conventional workshops by public transport operators. However, certain hydrogen-specific components, such as the fuel cell or battery, require specialist maintenance to ensure not only the vehicle's condition but also its safety.

The vast majority of hydrogen vehicle checks and maintenance are carried out directly by transport operators. SAFRA provides all its workshop staff with the usual training in vehicle discovery and maintenance, enabling them to handle minor maintenance afterwards.

For specific maintenance work, SAFRA works on :

1. Batteries: whatever their technology, they require no special maintenance. All that's required is occasional monitoring of their state of health (the famous SOH<sup>1</sup>), to check that they are ageing evenly across the cells. In a hydrogen-powered vehicle, ageing is calendar-based and has little to do with depth of discharge (the DOD<sup>2</sup>), since the cells are only used to a very limited extent, acting only as an energy buffer reservoir to restore additional kW when there is a high demand for power, and also to recover energy generated by the electric motor during braking and deceleration.
2. Hydrogen tanks: no special maintenance, but ageing must be checked, as is done on CNG vehicles with the CID check<sup>3</sup>.

---

<sup>1</sup> SOH: State of Health is a detailed record of traction battery monitoring. The result, expressed as a percentage, indicates the degree of degradation of the battery in relation to its initial capacity (loss of power and range).

<sup>2</sup> Depth of discharge (DOD), expressed in %, is the ratio between the capacity already discharged and the nominal capacity of the battery. In other words, the energy consumed by the battery. State of charge (SOC), expressed in %, is the ratio of residual capacity to nominal capacity. In other words, the energy remaining in the battery. The sum of SOC and DOD is always 100%.

<sup>3</sup> Based on European regulations: UN-ECE Regulation R110, Detailed Inspection is a visual check of the entire high-pressure circuit operating at 350 bar, from the tanks to the pressure reducer, which reduces the pressure of the hydrogen to around 10 bar before it is injected into the engine. In particular, we look for shocks or abrasions that could weaken the circuit. This inspection is carried out every 4 years.

3. Hydrogen fuel cell and distribution circuit: these are scheduled or hourly checks, depending on vehicle use. The main aim is to visually check the condition of the pipes, and validate the correct operation of the safety sensors (pressure, leakage, temperature), coolant and ionizing cartridge levels, and filter elements. These operations can be carried out by the operator after training, or by the fuel cell supplier during the warranty period, for example.

Full maintenance or tailor-made contracts can be drawn up, giving the operator full financial control over maintenance costs over the long term, as is often the case when launching a new energy sector.

### 5.3.1. Fleet management with VHYSION®.

From its supervision center in Albi, SAFRA collects all the data from its customers' vehicles in an automated way, in order to anticipate maintenance operations and respond to upstream needs. These connected services are brought together in a functional tool: VHYSION®.

This online platform includes 3 service offerings: VHYSION Fleet, VHYSION Report and VHYSION Diag :

- **VHYSION Fleet:** The Fleet service enables you to control and operate your fleet, optimize vehicle availability and keep operating costs under control.
- **VHYSION Report:** The Report service gives you access to a wide range of reports, enabling you to view data on the vehicles in your fleet in real time.
- **VHYSION Diag:** The Diag service enables you to report vehicle faults and breakdowns using connected vehicle data, in order to anticipate maintenance and breakdowns, and optimize the operation of your vehicles to obtain the best possible availability rate.



## 5.4. Recruiting and training future employees

To meet the challenges of recruitment and increased activity in the hydrogen bus sector, SAFRA has decided to set up its own "SAFRA Academy" school to train future employees directly in the various professions it offers.

The aim is to offer professional opportunities to local jobseekers, and to train them directly in SAFRA's specific working methods, offering them a curriculum tailored to their skills needs and enhancing each candidate's career path.

**SAFRA**  
ACADEMY

Candidate selection is carried out upstream using a Simulation Recruitment Method (SRM), which consists of detecting in unqualified candidates the aptitudes defined for SAFRA's specific needs, via practical tests carried out in conjunction with Pôle Emploi.

Those who pass the tests are then invited to an interview at SAFRA without a CV. This is an innovative selection method, since only motivation is assessed, since the training will be delivered on the company premises. The training is provided by SAFRA employees and a partner specialized in industrial process training (AFPI). On completion of the training, the graduate joins the company as an assembly operator.

This approach will enable SAFRA to support its growth plan, linked to the development of low-carbon mobility over the next few years, by solving its recruitment needs, at a time when there is still a shortage of manpower in this sector. Training the future players in carbon-free mobility in-house also enables SAFRA employees to pass on their know-how and integrate new recruits more easily.

# 6. SAFRA Solutions

---

SAFRA also provides financing services for the acquisition of new zero-emission buses, as well as leasing solutions. This service also offers support in setting up hydrogen storage and distribution stations, to encourage the rapid establishment of complete hydrogen ecosystems. These services are provided in partnership with specialist players in these fields, with extensive expertise.




The addition of financing systems and hydrogen filling stations perfectly completes the mobility offer that SAFRA is proposing to facilitate and accelerate the decarbonization of transport, and thus commit the community to this conversion in the long term.



Eric Baleviez, Sales & Services Director at SAFRA comments, *"We have added new solutions to our already comprehensive mobility offering. It has been totally developed to serve our customers, whether they are private or public, urban or interurban, and its ambition is to support them in their decision-making when implementing a hydrogen mobility system. By integrating financing and leasing solutions, and offering products that complement the creation of their hydrogen ecosystem, this will help accelerate the decarbonization of transport. To date, we are the first to offer this complete*

*package, combining new and retrofitted hydrogen-powered vehicles, full maintenance, training and site safety. Our products and services, backed up by solid, proven partnerships, are designed to simplify the customer's H2 ecosystem. In this way, we are putting in place all the pieces of tomorrow's mobility puzzle".*

## 7. Technical datasheets




**HYCITY**

**Bus full hydrogène**

Autobus hydrogène zero-emission, conçu et fabriqué par SAFRA.

[www.safra.fr](http://www.safra.fr)



**HYCITY**

**Full hydrogen bus**

Zero-emission hydrogen bus, designed and manufactured by SAFRA.

[www.safra.fr](http://www.safra.fr)



**H2-PACK**

**Kit de retrofit**

Transformation de véhicules Diesel en véhicules hydrogène zero-emission.

[www.safra.fr](http://www.safra.fr)



**H2-PACK**

**Retrofit kit**

Transformation of Diesel vehicles into zero-emission hydrogen vehicles.

[www.safra.fr](http://www.safra.fr)



**VHYSION**

**Services connectés**

Solutions et services connectés pour le suivi, la gestion et la maintenance de flottes d'autobus et retrofit.

[www.safra.fr](http://www.safra.fr)



**VHYSION**

**Connected services**

Connected solutions and services for the fleet management and maintenance of buses and retrofit.

[www.safra.fr](http://www.safra.fr)