



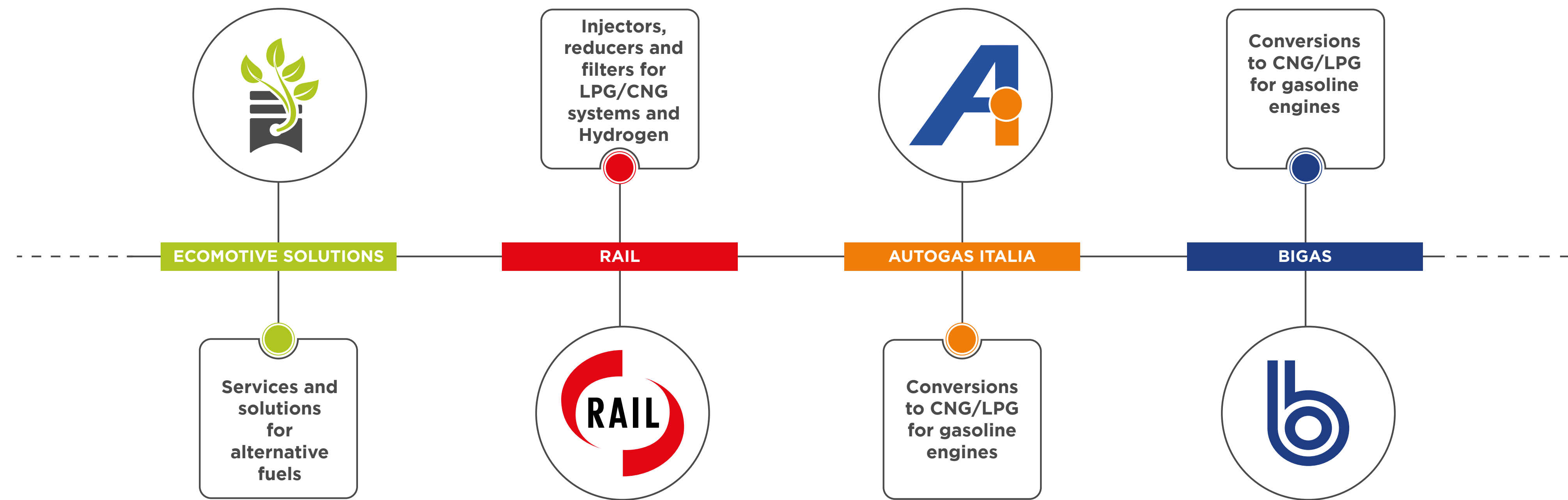
COMPANY PRESENTATION

Our Group and the solutions we offer

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ecomotive solutions





20/06/2025



Group presentation

In **2025**, the **Ecomotive Solutions Group** takes shape, the evolution of an industrial path that unites **Ecomotive Solutions**, **Rail**, **Autogas Italia** and **Bigas**. **Ecomotive Solutions**, part of the **Holdim Spa Group**, active since **1991** in the development of advanced solutions for electronic engine management, stands out for its expertise in alternative fuels and renewable energy applied to internal combustion engines.

The company develops and produces Made in Italy technologies and components, including the **Diesel Dual Fuel** electronic platform, Otto-cycle engines for biomethane and hydrogen, and consolidated

Bi-Fuel systems for the retrofit of petrol vehicles.

Thanks to a constant commitment to research and development, **Ecomotive Solutions** offers engineering services, certified training and assistance on a global scale.

In line with the group's strategies, in **2022** it integrated **Autogas Italia** and **Bigas**, historic brands in bi-fuel conversion systems (CNG and LPG), and in **2024** it started the merger with **Rail**, leader in the production of injectors for biofuels, consolidating its leading role in the energy challenges of the future.

Company presentation

Ecomotive Solutions



Ecomotive Solutions

Since **2009**, it has been developing technologies for the use of alternative fuels. Thanks to its in-depth knowledge of engine control electronics, it designs solutions in a wide range of applications: **automotive, off-road, industrial, marine** and **railway**.

It deals with the design and production of **ECU, software** and mechanical components. It offers dedicated applications for each type of vehicle with the corresponding homologation service.

It offers **engineering, prototyping** and **pre-series** production services for the conversion of combustion engines to use alternative fuels. **Ecomotive Solutions** designs, produces and markets systems and components for the use of alternative fuels, including **Dual Fuel, Bi-Fuel** and **Full Gas**.



Products and Services

Commercial products and systems:

Design, production and marketing of products for the use of alternative fuels, Dual Fuel, Bi-fuel and Full Gas;

Prototypes & Micro-series:

Development and prototyping engines and injection systems for a wide range of fuels, dedicated to OEM, power generation applications, etc.;

System integration:

Know-how and technologies essential for the implementation of special and complex projects, supporting customers in achieving their system objectives;

Testing:

Complete 360° emission tests for vehicles and engines.
Design and production of power test benches and road simulators;



Ecomotive Solutions

Electronic platforms

Diesel Dual Fuel:

Enables all diesel engines, both new and existing, to use alternative fuels, reducing CO₂ emissions and operating costs, and setting a new global standard for sustainable mobility and engine technology.

Petrol Bi-Fuel:

Bi-Fuel systems for petrol vehicles with port injection and direct injection, designed to reduce emissions and operating costs.

Full Gas conversion:

Electronic control systems, injection systems and engineered mechanical modifications for the development of spark ignition engines with minimal investment. The most flexible platform on the market for OEM applications and the retrofit of existing engines and vehicles.



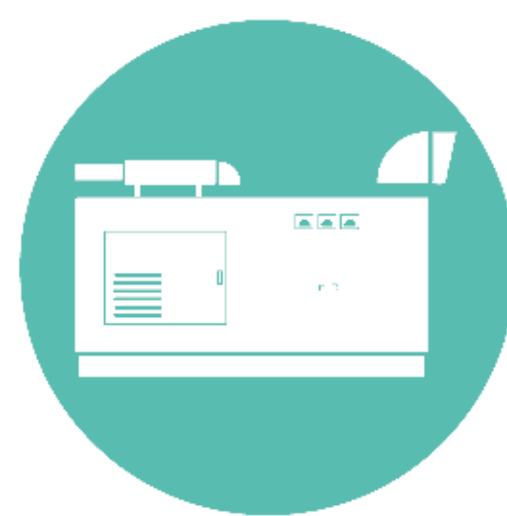
DIESEL DUAL FUEL



AUTOMOTIVE



HEAVY DUTY



ENERGY



OFF-ROAD



MARINE

ALTERNATIVE FUEL

LPG

(BIO) CNG

(BIO) LNG

H2



20/06/2025

BI-FUEL



AUTOMOTIVE



ENERGY



OFF-ROAD



MARINE



RAILWAY

ALTERNATIVE FUEL

LPG

(BIO) CNG

H2



ENGINE CONVERSION - Full Gas



HEAVY DUTY



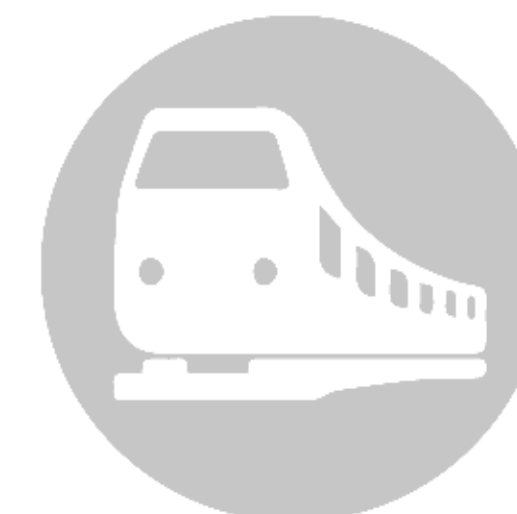
ENERGY



OFF-ROAD



MARINE



RAILWAY

ALTERNATIVE FUEL

LPG

(BIO) CNG

(BIO) LNG

H2

ETHANOL

METHANOL

DME



20/06/2025



D-GID LIGHT 32

Light-duty vehicles
4 cylinders

D-GID EVO

Medium/heavy-duty
with less than **300 hp**
up to **6** cylinders

D-GID EVO PLUS

Heavy-duty with more
than **300 hp** up to **6**
cylinders





20/06/2025



D-GID

Heavy-duty vehicles
over **400 hp**

SWITCH

Gas level monitoring

DIGITAL SWITCH

Gas level monitoring,
autonomy and diagnosis





Rail

A consolidated brand within the **Holdim Group**, **Rail** has been designing, producing and marketing injectors for **LPG/CNG** and **Hydrogen** systems for the automotive sector since **2006**.

In **2025** it was merged into **Ecomotive Solutions**, which together with **Autogas Italia** and **Bigas**, constitute the hub with the largest technological offering in the world of conversions.

Thanks to continuous investments in research and development, **Rail** today aims to further increase the quality of its products with the aim of confirming itself as a reliable and innovative partner for its customers. The goal is to achieve excellence by reaching the highest quality standards.



20/06/2025



IG4 DAKOTA OEM

Single injector for **LPG/CNG** applications **IG4 DAKOTA OEM** version

IG1 APACHE HD

Rail injector for gaseous phase **LPG** and **CNG**



Company presentation

Ecomotive Solutions



20/06/2025



IG7 DAKOTA LP & LHF

Rail injector for gaseous phase of **LPG** and **CNG**

IG6 TAURUS II

Single Point Dispenser for **LPG/CNG** Gas Phase
for Heavy-duty vehicles



Company presentation

Ecomotive Solutions



GREENER LNG REDUCER

Single stage reducer for **LNG** applications, standard version

Company presentation

Ecomotive Solutions



GREENER LNG REDUCER

Single stage reducer for **LNG** applications, version with coil

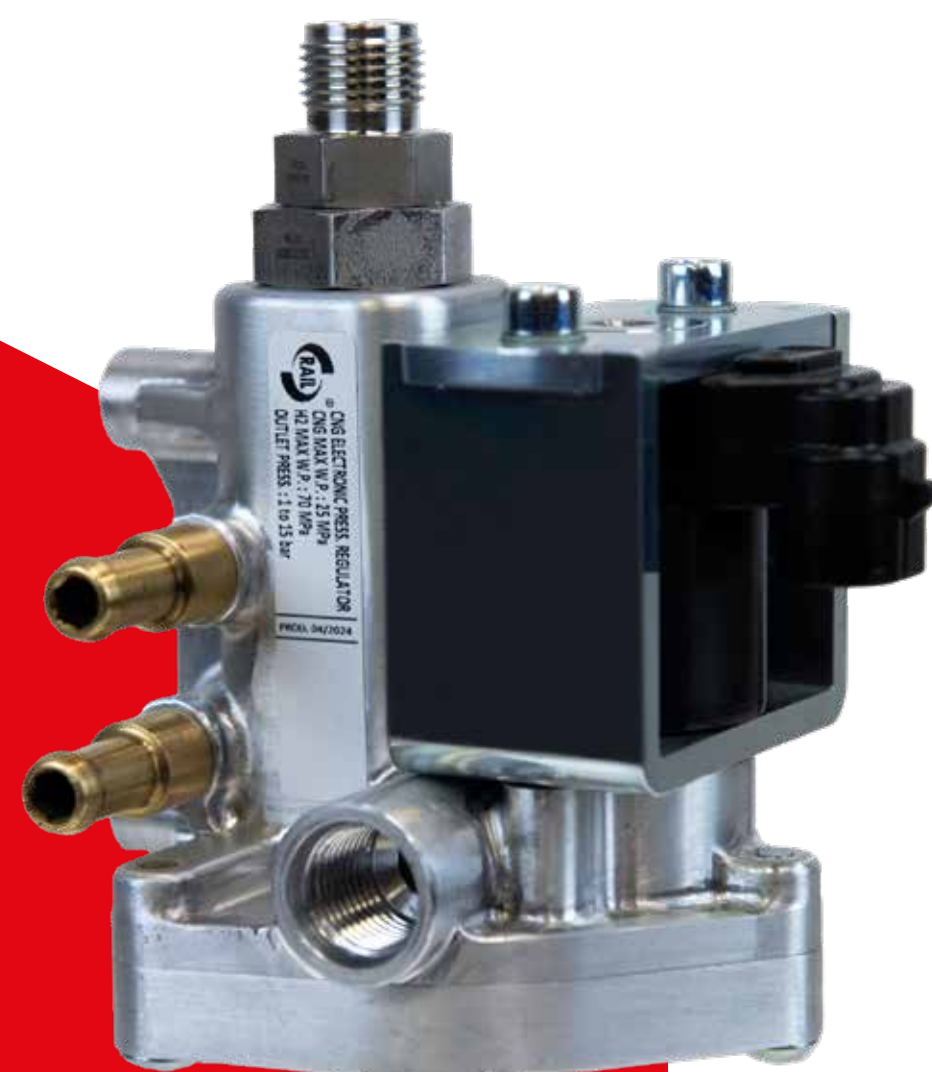


TYRION REDUCER

Single stage reducer for sequential injection applications of **CNG**



20/06/2025



CNG ELECTRONIC PRESSURE REDUCER

Electronic reducer under development

SPECTRE

New **LPG** reducer - available soon



Company presentation

Ecomotive Solutions



Autogas Italia

Active since **2000** and part of the **Holdim Group** since **2016**, **Autogas Italia** has become over the years a point of reference in the world of gas engine conversions.

The company produces and distributes **CNG/LPG** conversion systems for petrol and diesel vehicles.

A versatile partner for gas conversion professionals for any engine, both petrol and diesel.

New partnerships in emerging markets where the development of alternative energy sources is strategic for the country's growth.



20/06/2025



RABBIT Unit 32

Electronic control unit for **LPG/CNG** systems with indirect sequential injection, designed for **3-4** cylinder vehicles, also available in **Rabbit 48 OBD** version

REDUCER RPG09

LPG reducer for sequential injection system



Company presentation

Ecomotive Solutions

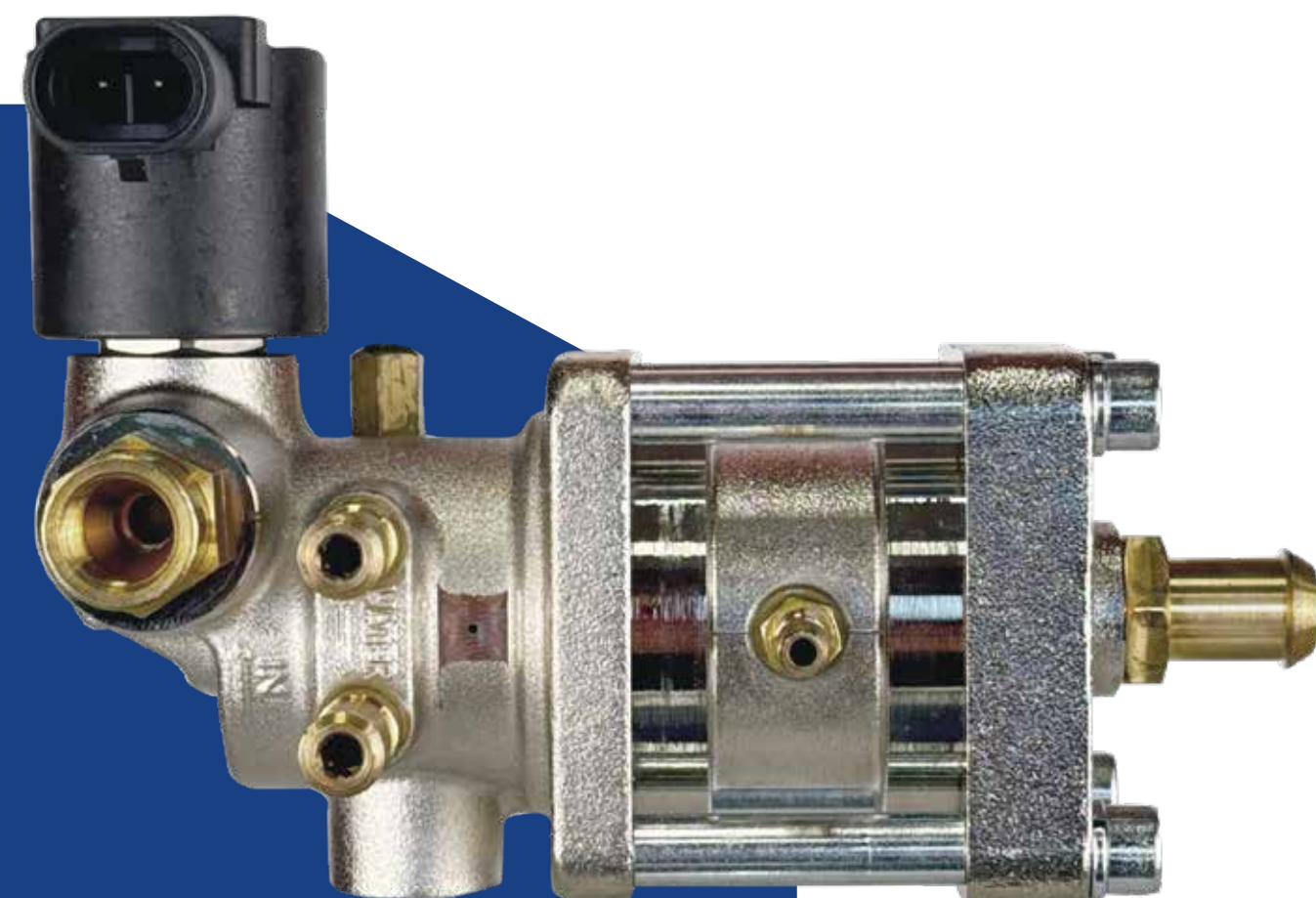


Bigas

Historic and established company in the gas world, joins the **Holdim Group** starting from **2022**.

Bigas develops and produces components and complete systems for conversion to **LPG** and **methane** for automotive traction.

Its long history and excellent credibility, built on international markets, make **Bigas** an excellent protagonist in the new global energy scenarios.



REDUCER RI27-J

The **CNG** reducer **RI27-J** for sequential systems is suitable for any type of car up to **300 Kw (402.3 HP)**

REDUCER RI21

The **LPG** reducer **RI21** is suitable for sequential systems on cars up to **140 Kw (187.7 HP)**





20/06/2025



REDUCER RI21 DOUBLE

The **LPG** reducer **RI21 Double** is suitable for any type of car with a power between **140 Kw** and **280 Kw** (**187.7** and **375.5 HP**)

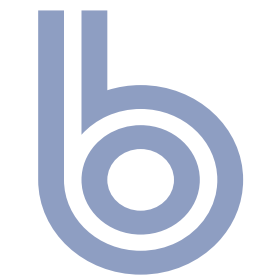
EASY GAS MONO 48 OBD

Electronic control unit for **LPG/CNG** systems with indirect sequential injection, designed for **3-4** cylinder vehicles



Company presentation

Ecomotive Solutions



Group Kit

Thanks to the products illustrated in the previous pages, kits for diesel and petrol vehicles can be created.

In detail PETROL vehicles:



EASY GAS MONO
48 OBD



SWITCH



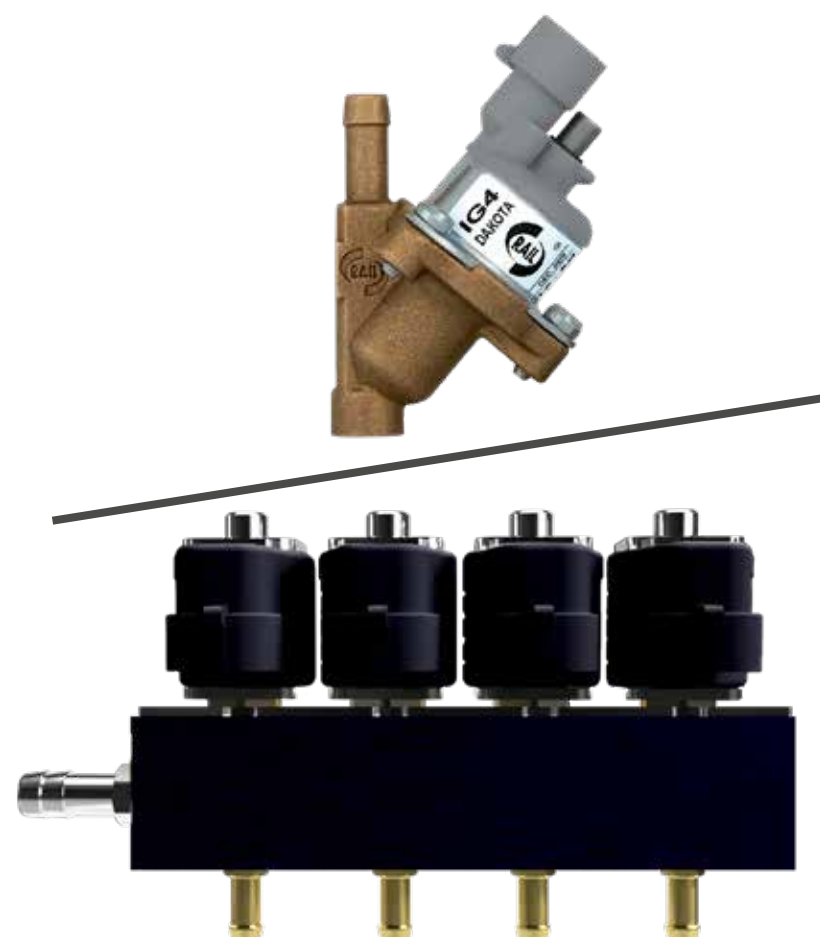
TYRION CNG



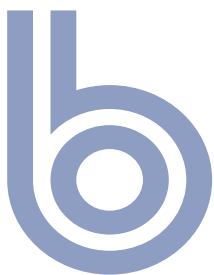
FILTER



P/T MAP SENSOR



INJECTORS



Group Kit

Thanks to the products illustrated in the previous pages, kits for diesel and petrol vehicles can be created.

In detail PETROL vehicles:



RABBIT Unit 32
Also available
48 OBD



SWITCH



SPECTRE LPG



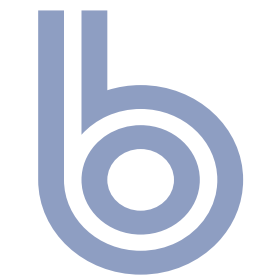
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P/T MAP SENSOR



INJECTORS



Group Kit

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In detail DIESEL vehicles:



D-GID EVO PLUS



SWITCH



BIGAS RI21 DOUBLE



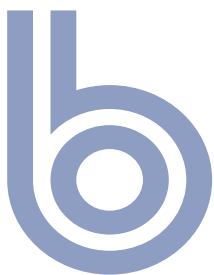
FILTERS



P/T MAP SENSOR



INJECTOR



Group Kit

Thanks to the products illustrated in the previous pages, kits for diesel and petrol vehicles can be created.

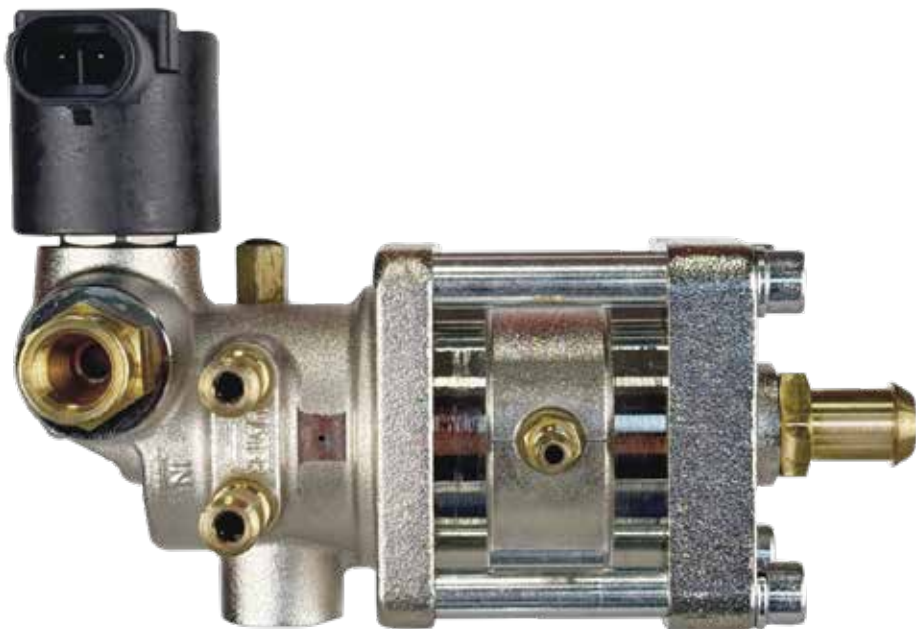
In detail DIESEL vehicles:



D-GID LIGHT 32



SWITCH



BIGAS RI27-J



FILTER



P/T MAP SENSOR



INJECTORS



Ecomotive Solutions ECU-CM

An electronic control unit designed to manage Otto-cycle engines, primarily intended for application on engines and vehicles with homologation purposes in mind.

The **ECU-CM** was developed to meet the need for complete customization of engine conversions and to allow the same engine to be used across a wide range of vehicles or applications (Genset, OFF-ROAD, Automotive).

Developed in collaboration with **Dimsport**, a leader in automotive electronics, the **ECU-CM** offers both safety and versatility.



Main Features

- **Versatile Management:** The **ECU-CM** is designed to support both traditional and alternative fuels;
- **Customization:** The **ECU-CM** is compatible with the INCA software, well-known among OEMs, allowing for independent configuration and reducing development costs;
- **Certifications:** The **ECU-CM** is certified with **R110**, **R67**, and **R10** standards;
- **Engine Compatibility:** Specifically designed for **Otto-cycle** engines, it provides efficient and reliable control for up to **six cylinders**, managing up to **six ignition** coils and **six injectors**.

Technical Specifications

ECU-CM

- Power supply voltage **6.5 – 30V**;
- **20** analog inputs;
- Analog sensor supply **5V, 500mA**;
- **RPM sensor**: Hall effect, inductive;
- **Phase sensor**: Hall effect, inductive;
- **3** auxiliary Hall effect phase sensors;
- Management of **2 wideband** and **2 narrowband lambda sensors**;
- Management of up to **6** high-impedance injection channels;
- Management of up to **2** electronic throttle bodies;
- Management of up to **6** ignition channels with external power modules;
- Management of up to **6** low-side auxiliary outputs;
- Management of up to **3** timing measurement inputs;
- Management of **6** digital inputs;
- Management of up to **2** knock sensors;
- **SENT** communication;
- **CAN communication, at least 2 channels**: SAE J1939, standard and extended IDs;
- Operating temperature range: **-40°C to +125°C**;
- **Supports standard OBDII vehicle diagnostics.**



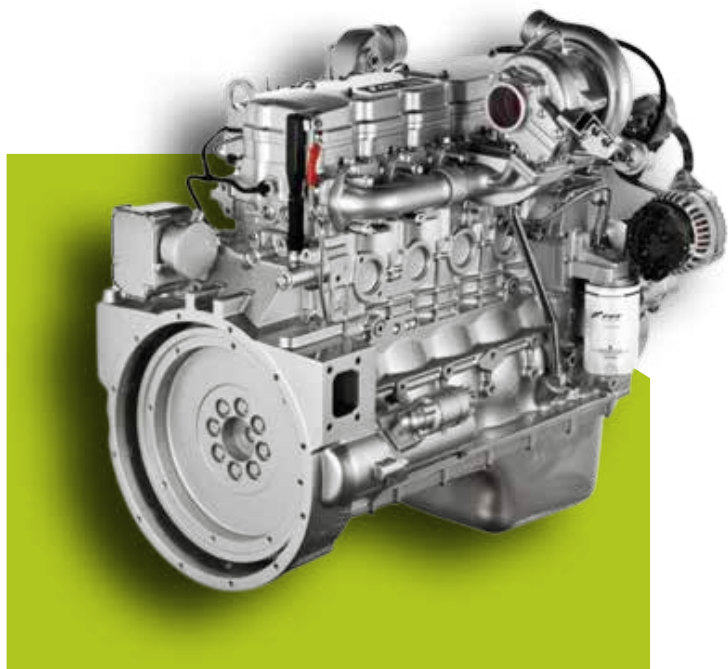


CASE HISTORIES

Ecomotive Solutions technologies can be integrated into any type of engine. The experience acquired in various application contexts allows the **Group** to design and supply tailor-made systems, calibrated according to the customer's technical and operational specifications.

Case Histories - Engines

FPT NEF N67 - FPT NEF N60 - CATERPILLAR CAT C 15 - ISUZU 3CB1



FPT NEF N67

N67 TURBO, CNG, 129 kW; 2150 RPM, port injection, application OFF ROAD

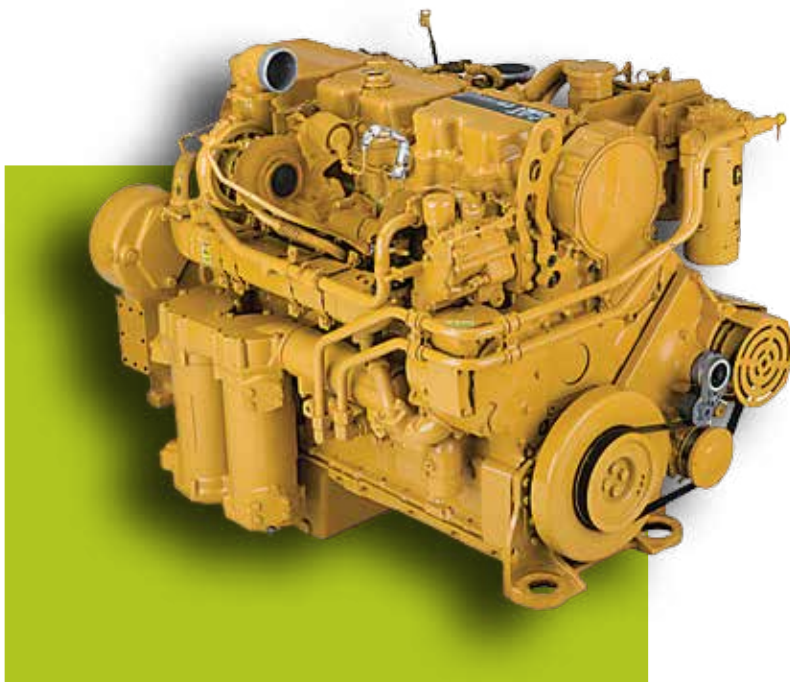
N67 TURBO, METHANOL, 85 kW; 1500 RPM, port injection, application INDUSTRIAL



FPT NEF N60

N67 TURBO, CNG, 129 kW; 2150 RPM, port injection, application OFF ROAD

N67 TURBO, METHANOL, 85 kW; 1500 RPM, port injection, application INDUSTRIAL



CATERPILLAR CAT C 15

N67 TURBO, CNG, 129 kW; 2150 RPM, port injection, application OFF ROAD

N67 TURBO, METHANOL, 85 kW; 1500 RPM, port injection, application INDUSTRIAL



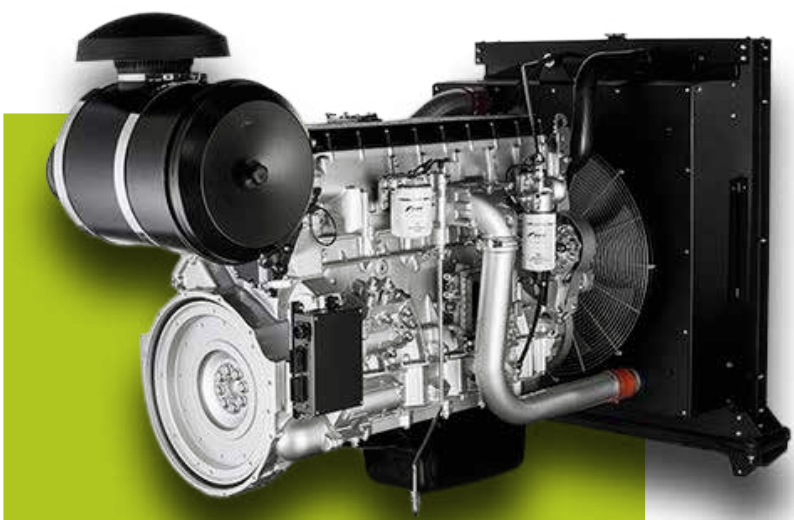
ISUZU 3CB1

N67 TURBO, CNG, 129 kW; 2150 RPM, port injection, application OFF ROAD

N67 TURBO, METHANOL, 85 kW; 1500 RPM, port injection, application INDUSTRIAL

Case Histories - Engines

FPT CURSOR 13 - FIAT 8217 - VOLVO PENTA - DEUTZ TC36



FPT CURSOR 13

C13 ASPIRATED, ETHANOL, 120 kW, 1500 RPM, port injection, application INDUSTRIAL

C13 TURBO, CNG, 270 kW, 1500 RPM, draw gas, application INDUSTRIAL

C13 TURBO, SYNGAS, 200 kW, 1500 RPM, draw gas, application INDUSTRIAL

C13 TURBO, LPG, 160 kW, 1500 RPM, draw gas, application INDUSTRIAL



FIAT 8217

FIAT 8217 TURBO, LNG, 170 kW, 1800 RPM, port injection, application RAILWAY



VOLVO PENTA

CNG, 180 kW, 3300 RPM, port injection, application MARINE



DEUTZ TC36

DEUTZ, 95 kW, 2200 RPM, port injection, application OFF-ROAD

Case Histories - Vehicles

Panda (from MILD HYBRID to BIFUEL + MILD HYBRID)



BI-FUEL MILD HYBRID



ECU



SWITCH



TANK



REFUELING PORT

Toyota C-HR (from HYBRID to HYBRID + CNG)



DIESEL DUAL FUEL - HYBRID



ECU



SWITCH



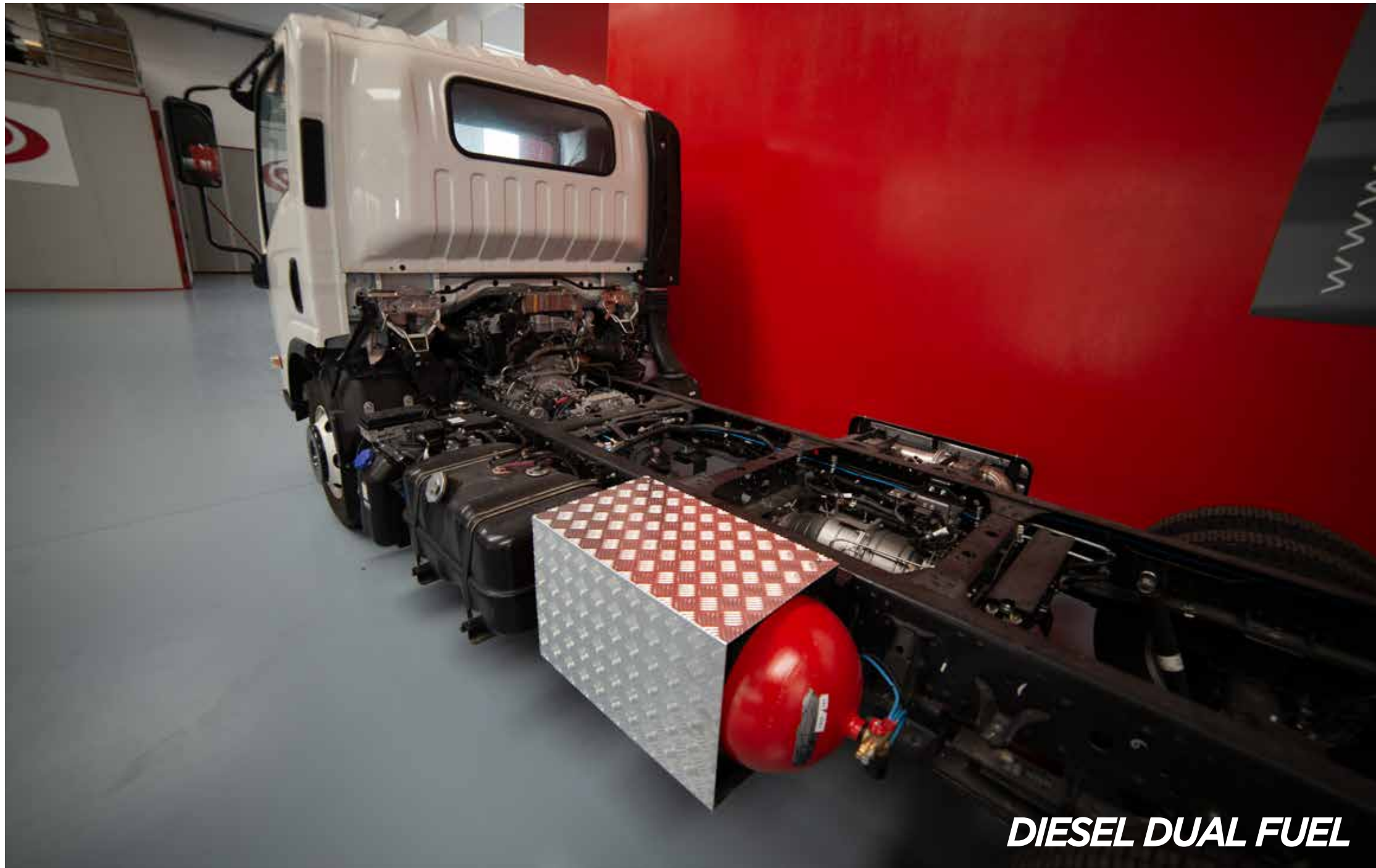
TANK



REFUELING PORT

Case Histories - Vehicles

Isuzu (from DIESEL to DIESEL + CNG)



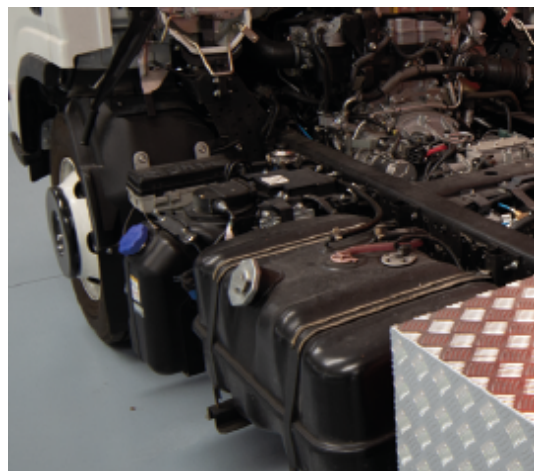
ECU



SWITCH



TANK



REFUELING PORT

Bus (from DIESEL to DIESEL + CNG)



ECU



SWITCH



TANK



REFUELING PORT

Case Histories - Vehicles

DAF XF 51 (from DIESEL to DIESEL + LNG)



DIESEL DUAL FUEL - LNG



ECU



SWITCH

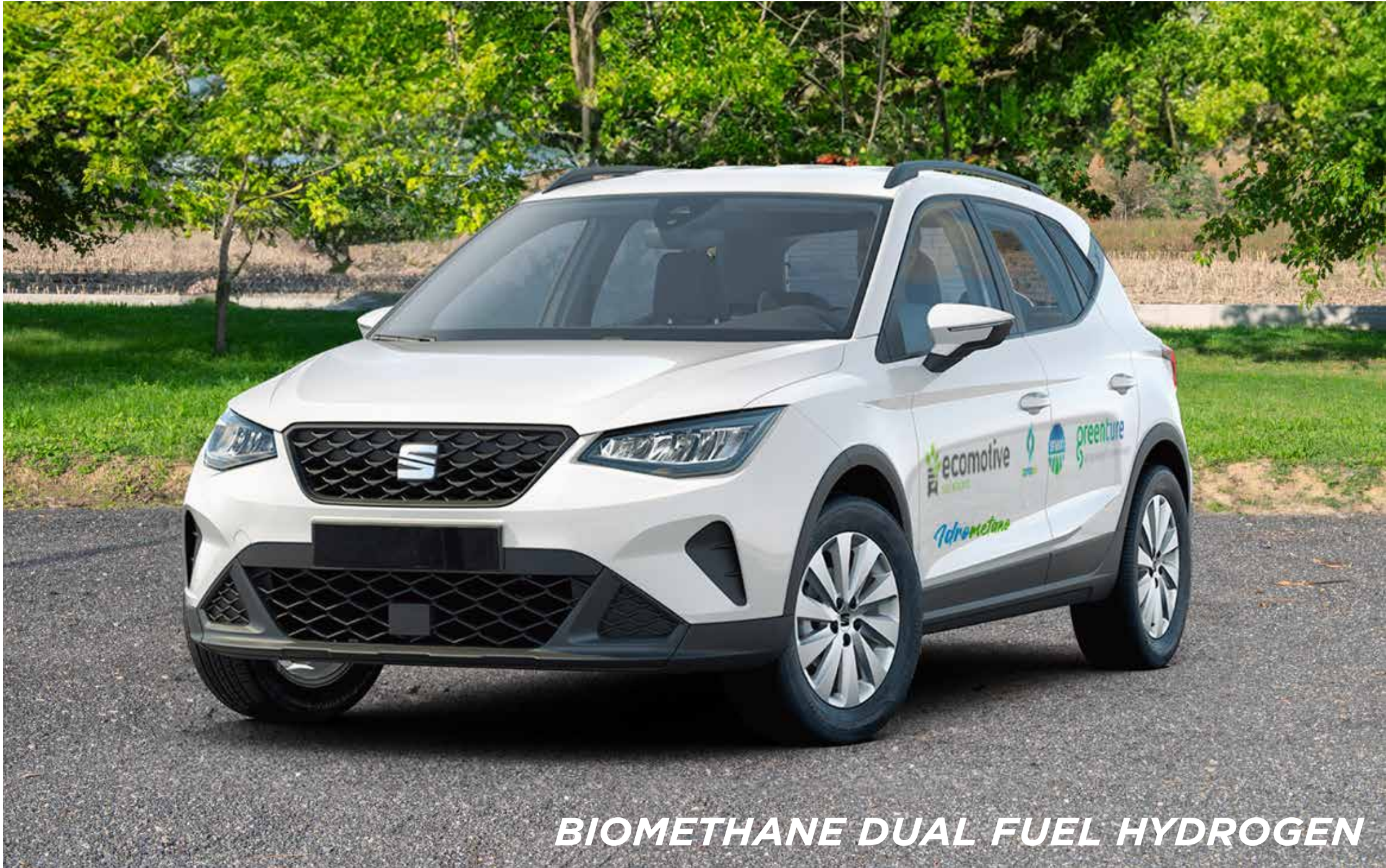


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REFUELING PORT

SEAT Ateca (from CNG to CNG + Hydrogen)



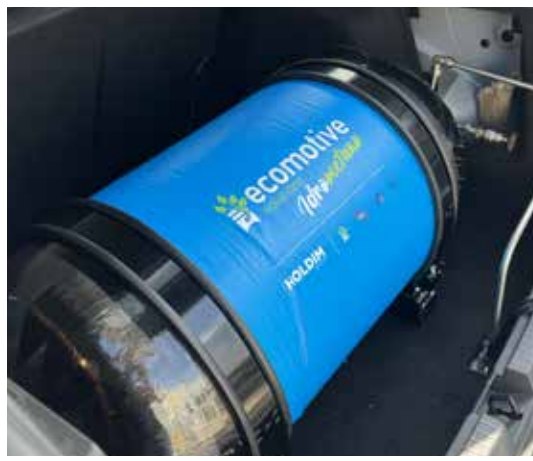
BIOMETHANE DUAL FUEL HYDROGEN



ECU



SWITCH



TANK



REFUELING PORT

Case Histories - Vehicles

GRU RTG (from DIESEL to DIESEL + LNG)



ECU



SWITCH



TANK

REACH STACKER (from DIESEL to DIESEL + LNG)



ECU



SWITCH



TANK

Case Histories - Vehicles

Boat (from DIESEL to 100% GAS = CNG)



ECU



SWITCH



TANK



REFUELING PORT

Telehandler (from DIESEL to 100% GAS = BioCNG)



ECU



TANK

Case Histories - Vehicles

TMR mixer (from DIESEL to 100% GAS = BioCNG)



ECU



TANK

Treno (from DIESEL to liquefied biomethane = BioLNG)



DISPLAY



TANK



REFUELING PORT



GreenForce, founded in **2023** within the **Holdim Group**, is engaged in the development and commercialization of solutions for sustainable mobility, with a particular focus on the marine, railway, and industrial sectors.

In synergy with **Ecomotive Solutions** and other technological partners, **GreenForce** offers customized systems based on proven technologies

or tailor-made prototypes, adaptable to any type of engine and fuel.

GreenForce is committed to developing zero-emission energy solutions, with a focus on hydrogen and fuel cell technologies, leveraging a global network of partners specialized in the renewable energy sector.

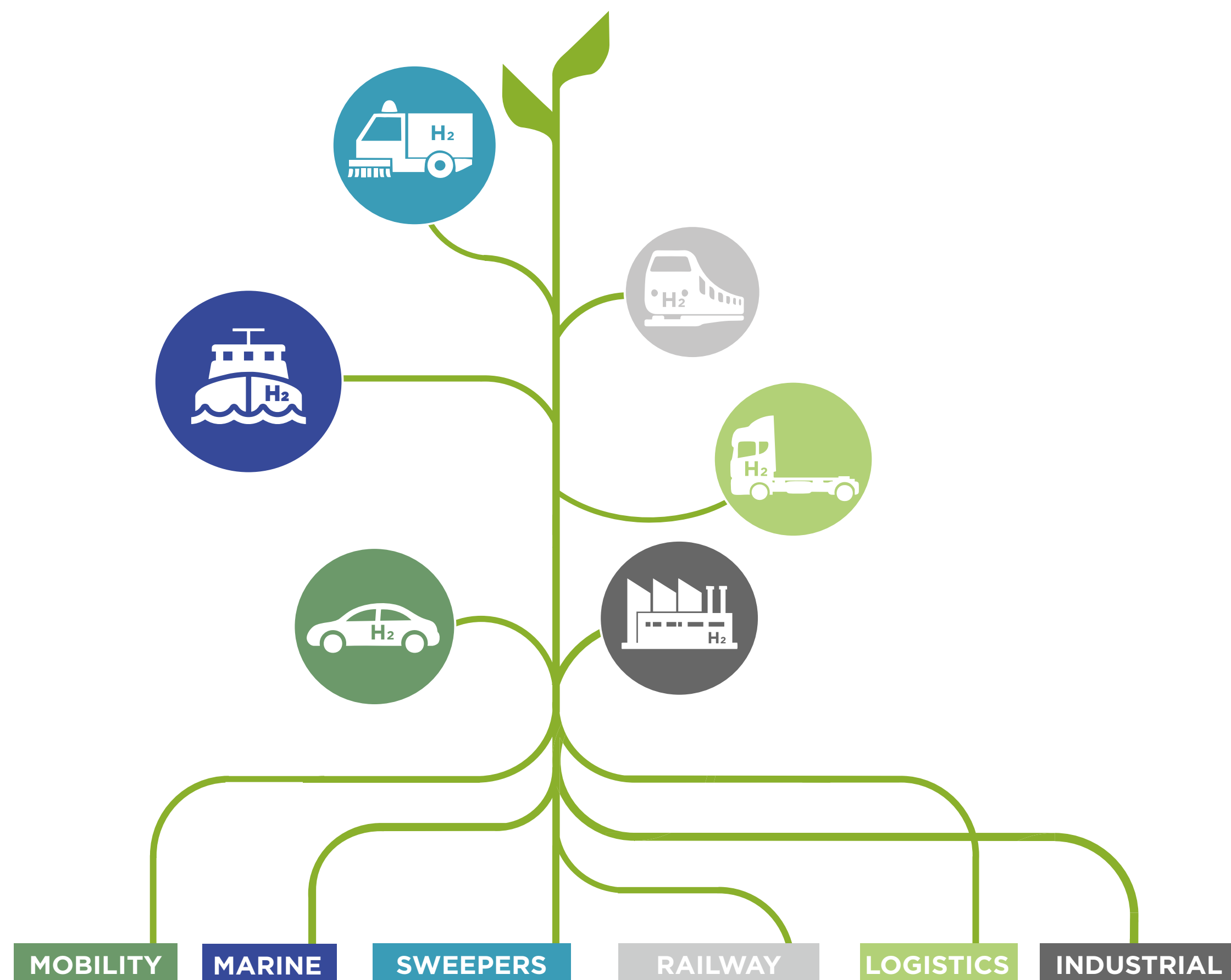


GreenForce

GreenForce, part of the **Holdim Group**, offers solutions for converting engines using zero-emission systems and energy carriers.

As a member of the **Holdim Group**, it draws on the twenty years of experience of **Ecomotive Solutions**, a trusted partner in the use of alternative fuels for vehicle and industrial applications with low or zero environmental impact.

In an increasingly environmentally conscious world, **GreenForce** aims to be a leader in promoting sustainable mobility solutions by providing innovative and customized services through partnerships with leading technology companies.



GreenForce

Business Areas

Focus:

Supply of complete fuel cell systems of low and high power.

Engineering:

Development of ad hoc solutions of fuel cell system and transformation of endothermic engines into 100% hydrogen engines.

Mobility:

Import and distribution of commercial, industrial vehicles and also electrical and hydrogen buses.

GreenForce offer:

Research and development are carried out entirely at the **Holdim Group** headquarters in **Serralunga di Crea** (AL), with prototyping opportunities made possible through OEM collaborations. **GreenForce** develops advanced fuel cell system solutions, in synergy with specialized companies, universities, research centers, and international partners: **SINOSYNERGY**, **SPECTRONIK**, **GREEN MACHINES** and **HOLTHAUSEN CLEAN TECHNOLOGY**.



20/06/2025



GreenForce

Hydrogen and tests performed

The idea of developing a hydrogen engine emerged at the end of **2022** following an in-depth analysis of how hydrogen-powered engines operate.

The project focused on defining the most suitable combustion strategy to optimize performance and reduce environmental impact.

Company presentation

Ecomotive Solutions





GreenForce

Hydrogen and tests performed

To this end, tests were conducted on two engines:

- A 1-liter, three-cylinder engine with spark ignition and indirect injection, used for test bench setup and preliminary testing.
- A **NEF 60** engine, a 5.9-liter, six-cylinder, turbocharged unit with spark ignition and indirect injection, used for more advanced testing.

Company presentation

Ecomotive Solutions



GreenForce

Key results of the Conversion

- **Performance:** The NEF 60 engine, powered by hydrogen, achieved a maximum power output of 140 kW at 2500 rpm, equivalent to 92.4% of its original maximum power on natural gas;
- **Efficiency:** With an optimized air/hydrogen mixture, the engine achieved an efficiency of up to 39% at 2000 rpm, surpassing the efficiency of the natural gas-powered engine (37%).





GreenForce

Key results of the Conversion

- **Emissions:** Nitrogen oxide (NOx) emissions were significantly reduced, especially with leaner mixtures (i.e., more air and less hydrogen).
- **Hydrogen Fuel System:** The components of the hydrogen fuel system, such as the pressure regulator, injectors, safety valves, etc., were entirely developed and manufactured by Ecomotive Solutions companies.



GreenForce

Key results of the Conversion

- **Turbocharging:** The use of a variable geometry turbocharger allowed for an increase in engine power by introducing more air into the cylinder and improving efficiency
- **Calibration:** Engine calibration was essential to optimize performance and reduce emissions. Various parameters were optimized, including injection timing, ignition advance, and turbine geometry, all controlled by the electronic control unit.





HOLDIM group

Holdim Group

The headquarters of the **Holdim Group** is located in **Serralunga di Crea**, in the heart of the province of Alessandria, a symbol of solid roots and Italian excellence.

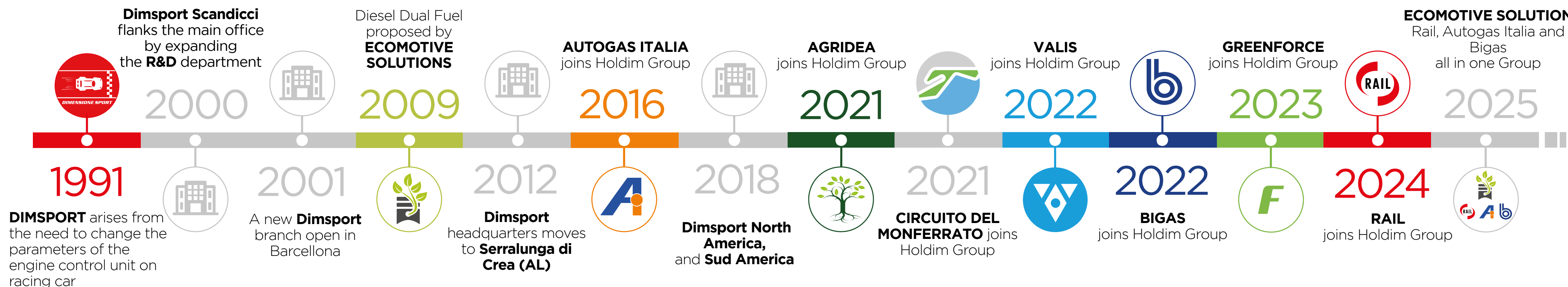
The **Group** boasts a cutting-edge research and development centre in Scandicci, Tuscany, and a network of commercial branches strategically distributed in **four foreign countries**: Spain, the United States, Mexico and Paraguay.

Holdim's strength lies in its ability to build strategic and collaborative relationships with original equipment manufacturers (**OEMs**), prestigious universities and internationally renowned research institutes.

At the heart of **Holdim's** mission is a deep commitment to environmental respect and support for local communities.



20/06/2025



250
Employees



160
Markets in which we are present



4
Foreign countries



70
Millions in revenue

Company presentation

Ecomotive Solutions

Holdim Companies



Since **1991 Dimsport** has been synonymous with electronic recalibration for Automotive in the world: the **Race** line includes professional systems for managing engine operating maps. **Rapid** line a wide range of add-on modules for turbo engines, **Rapid Bike** offers add-on modules for motorcycles. The **Dyno** line offers power test benches for cars, motorcycles, trucks and tractors.



Since **2009, Ecomotive Solutions** has been offering engine control electronics for the use of alternative fuels in the automotive, industrial, energy, railway, and marine sectors. The company offers **Diesel Dual Fuel** platforms, full gas conversions, gas hybrid vehicle solutions, ethanol and DME fueled engines, liquid methane/biomethane, cold ironing, gas charging systems for electric vehicles, and hydrogen mobility solutions.



A well-established brand within the **Holdim Group**, **Rail** designs, manufactures and sells injectors for **LPG/CNG** and **hydrogen** systems for the automotive sector since **2006**. In **2025** it was merged within Ecomotive Solutions, which together with **Autogas Italia** and **Bigas**, form the pole with the largest technological offering in the world of conversions.



Historical and established company in the gas world, becomes part of the **Holdim Group** from **2022**. In **2025** it was merged within **Ecomotive Solutions**. **Bigas** develops and manufactures components and complete systems for conversion to automotive **LPG** and **CNG**.



Active since **2000** and part of the **Holdim Group** since **2016 Autogas Italia** has become over the years a reference in the world of gas engine conversions. In **2025** it was merged within **Ecomotive Solutions**. The company manufactures and distributes **CNG/LPG** conversion systems for gasoline or diesel vehicles.



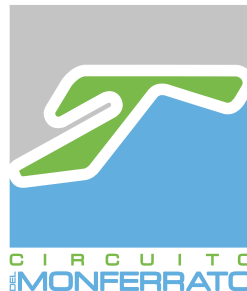
GreenForce was founded in **2023**, a company engaged in the development of **Fuel Cell system** solutions and the transformation of endothermic engines into **100% hydrogen** engines.



Agridea looks to a sustainable future in agriculture and hospitality, enhancing the land and training young professionals. A training center, an exclusive relais surrounded by nature and the development of alternative crops are the missions of this company.



Recent group entity focused on the design and installation of dedicated fuel vapor recovery and industrial systems. These machineries are remotely manageable, allowing our operators to be able to constantly monitor and intervene on systems installed around the world.



In **2021, Holdim Group** redeveloped a track for testing vehicles powered by alternative fuels. An urban route simulation is planned within the circuit. A state-of-the-art technology hub available to OEMs and top universities.

Company presentation

Ecomotive Solutions



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