

# ON THE ROAD TO DECARBONISING TRANSPORT







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# DECARBONISING TRANSPORT





**TAKING ACTION**  
**TO DEAL WITH THE CLIMATE CRISIS**

**The energy transition required**

Road freight transport is engaged in a necessary transition that should lead it to progressively reduce the use of fossil fuels and achieve carbon neutrality as soon as possible.

**Enhanced regulatory restrictions**

The Paris Climate Agreement adopted in 2015, calls for keeping the rate of global warming below 2°C by 2100. To help achieve this, the European Union has set CO<sub>2</sub> emission reduction targets for truck manufacturers: -15% by 2025 and -30% by 2030 compared to 2019, in order to attain tank-to-wheel carbon neutrality in transport by 2050.

**247** *low-emission zones were set up in 13 European countries. In the very near future, internal combustion engine powered trucks will no longer be allowed on the roads.*

**RENAULT TRUCKS**  
**HAS MADE ITS COMMITMENT**

**Attaining carbon neutrality as of 2040**

We are committed to speeding up decarbonisation in our operations, to help limit the increase in the earth's temperature to 1.5°C. Our targets, established under the Science Based Target initiative (SBTi), are based on scientific evidence.

By 2040, we will only be selling trucks that are 100% fossil-free.

To that end, we are moving in stages, gradually abandoning the use of fossil fuels, as decarbonisation and electrification are extended to all types of use.

We are basing our transition on three complementary types of technology:

- Internal combustion engine powered by non-fossil fuels (synthetic diesel fuel, bio fuels, biogas and, in a few years, hydrogen)
- Battery electric vehicles,
- Fuel cell electric vehicles.

**Making electric the new normal**

50% of our sales will be electric vehicles in 2030.

We are ready to make electric trucks the new market standard by proposing a full range of robust and profitable vehicles that meet the needs of all our customers.







## RENAULT TRUCKS

### REDUCING CO<sub>2</sub> EMISSIONS

Renault Trucks has taken on the challenge of reducing CO<sub>2</sub> emissions in 3 ways:

1. Offering trucks with ever greater fuel efficiency
2. Providing 100% electric solutions for emission-free use in transport
3. Extending the life of its vehicles in a circular approach.

#### Enhancing the fuel efficiency of our vehicles

Each new generation of Renault trucks consumes less fuel and emits less CO<sub>2</sub> than its predecessor. An offer of adapted services allows to further improve their energy efficiency. Our powertrains have substantially reduced the environmental impact of our vehicles, but without diminishing their performance levels or reliability.

#### Getting on board for electric vehicles

Renault Trucks produces light, medium and heavy duty electric vehicles, designed for urban and regional distribution, refuse collection and light construction activities. In addition to this range of vehicles, Renault Trucks is developing a full range of related services: the supply of batteries and infrastructure solutions for battery charging, supplementary systems to optimise the energy used, repairs and maintenance support, and financing and insurance.

In order to expand electrification to other sectors such as heavy construction, container transport or long-hauling, we are developing new technological systems that incorporate batteries or a hydrogen fuel cell.

#### Creating virtuous cycles for the circular economy

In order to reduce the use of natural resources and limit the impact on the environment (especially their carbon emissions), we are orienting our vehicle production and industrial operations to fit with a circular economy. A circular economy takes into account second and third lives for the vehicles, their re-use in various forms, and their recycling:

- Re-generate: we renovate and recondition our used vehicles, update their software and adopt the latest generation technology available on our new trucks in order to extend their working lives and seek to prevent their obsolescence.
- Re-purpose: in our Used Trucks Factory, we give our used trucks a new livelihood by transforming them into customised second-hand vehicles. Tractor units are transformed into Rigid; diesel engine systems are converted to bio-diesel fuel.
- Re-cycle: we offer a line of mechanical assemblies and renovated components for standard replacements, and their production has 60% less environmental impact than that of new parts.







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## WHAT TYPES OF FUEL SOURCES TO USE FOR DECARBONISATION





## TRUCK

### FUEL TYPES NOW AVAILABLE

#### Decarbonised diesel fuels

Bio-diesel, a fatty-acid ester produced from vegetable oils such as rapeseed, provides a saving of between **55 and 60%\*** on CO<sub>2</sub> emissions compared to fossil-based diesel fuel. At present, it is one of the cheapest decarbonisation solutions.

Synthetic fuels (XTL, HVO), second-generation bio fuels, provide further reductions in CO<sub>2</sub> emissions. Like bio-diesel, however, they are likely to remain in short supply due to the limited amount of material which they are derived from.

E-diesel, produced using renewable electricity, water and CO<sub>2</sub> from the atmosphere, also provides a **65%\*** reduction in emissions compared to fossil diesel fuel. However, making it available requires substantial investments.

#### Gas

Fossil natural gas provides a saving of between **0 and 10%\*** only of CO<sub>2</sub> emissions compared to diesel fuel. It is thus not a viable option for decarbonisation.

Bio-methane or biogas, produced by the fermentation or gasification of organic matter, serves to emit **75%\*** less CO<sub>2</sub> than diesel fuel. However, the quantities of biogas available are, and will remain, limited. This means that the transport sector will be competing with other business sectors, and its price is due to rise due to the probable decrease in public funds for its production (in 2019 it was 4 times more expensive than natural gas).

It is also important to note that biogas emits nitrogen oxides (NO<sub>x</sub>), which will disqualify it for use in the city. Lastly, its potential greenhouse gas effect, which contributes to global warming, is 86 times that of CO<sub>2</sub> over an 80-year period and thus requires very close monitoring to minimise the risks of leaks during its production and transport.

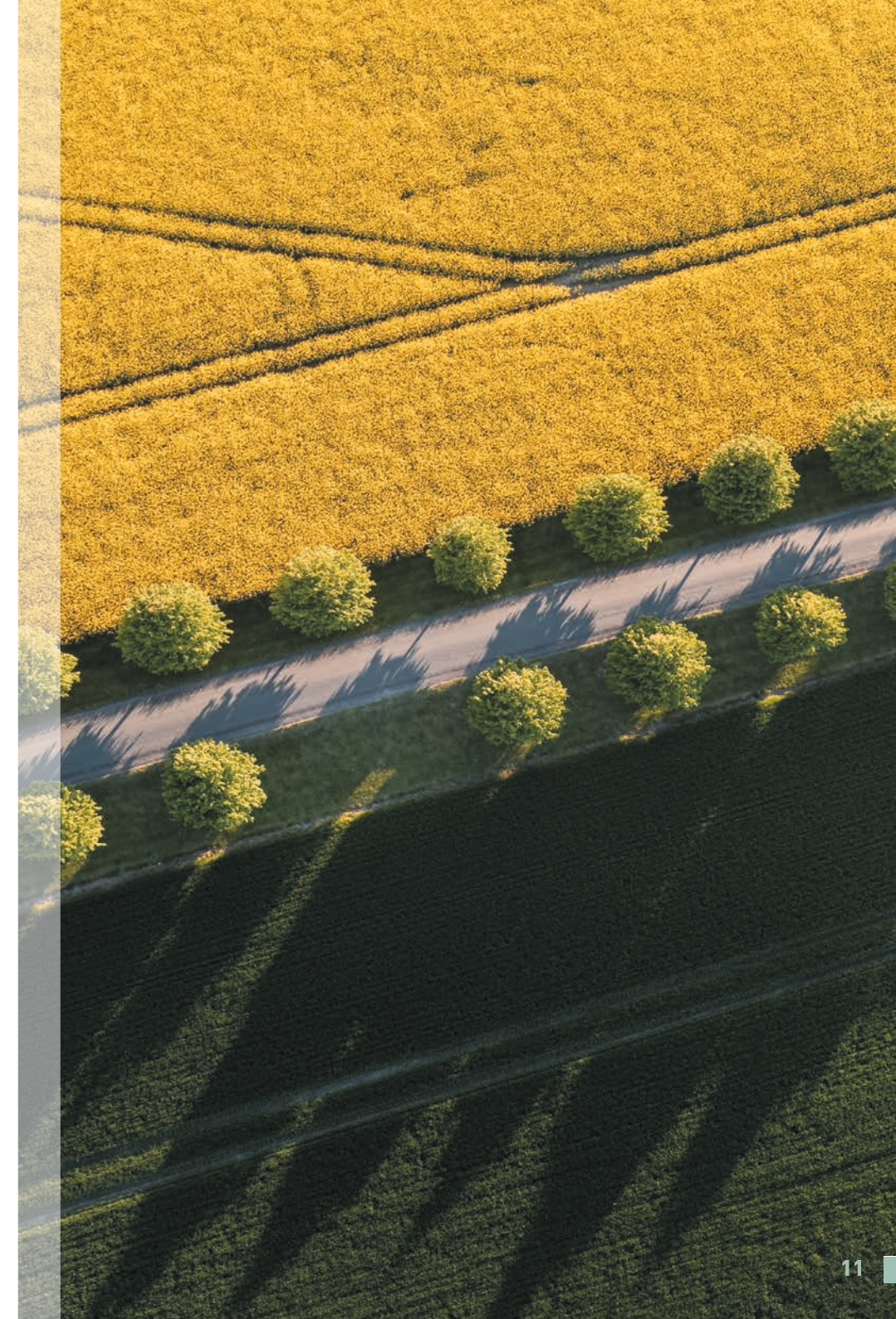
#### Hydrogen

The grey hydrogen we have access to presently is produced from fossil methane and emits **14%\*** more CO<sub>2</sub> than fossil-based diesel fuel. Switching to green hydrogen which is produced using renewable, electric-powered electrolysis would, however, serve to reduce CO<sub>2</sub> emissions up to **65%\***.

This transition will take place slowly and at the cost of heavy investment, and road transport will still be at a point where it is competing with other sectors that have no other way to decarbonise. Its use on a large scale is not expected before the next decade.

Hydrogen fuel cells are the most advanced technology today. These cells convert hydrogen and oxygen into electric power. An alternative use of hydrogen is in combustion engines. However, one downside is that such systems emit a small amount of NO<sub>x</sub>, which makes their use in cities unlikely, and they consume a bit more hydrogen than fuel cells.

\*from cradle to grave







### Electric power

On average, in Europe, decarbonised electric power produced from renewable energy sources or nuclear generation currently allows for a 55%\* savings in CO<sub>2</sub> emissions compared to fossil-based diesel fuel. In some countries, such as France, that savings is over 80%\*.

Electric motor technology is already in hand, and the working capacity of batteries is steadily increasing.

Free of direct emissions effects, electric trucks are also the most efficient solution to urban pollution problems. They can be recharged at night - during off-peak hours - on either an industrial, three-phase connection or a basic charging terminal. They run silently, and they provide improved comfort of use for drivers.

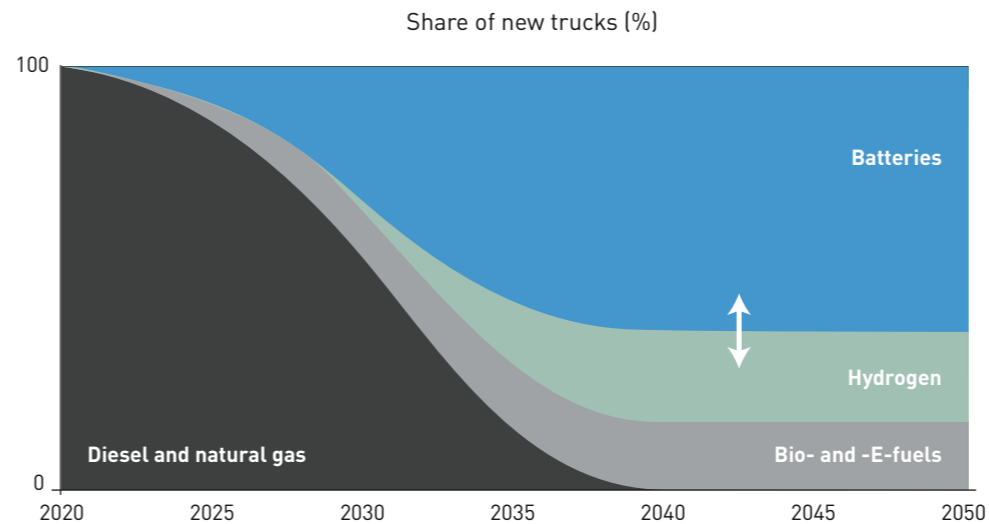
Electromobility is becoming increasingly competitive. Some applications, such as refuse collection, are already fully competitive. Starting in 2025, the total cost of owning and operating a battery-powered electric truck for city use will be less than that of a diesel fuel truck. By then, all types of urban uses will be covered by electric trucks.

\*from cradle to grave

### Moving towards carbon neutrality

A "cradle-to-grave" analysis of trucks, their total cost of operation, their ease of use, and the availability of decarbonised fuels, has led us to foresee freight transport in 2040 as follows:

- 0% of trucks using fossil-based diesel fuel or natural gas
- Up to 20% of trucks running on bio-fuels or e-fuels for the heaviest uses (long-haulers, heavy construction, etc.)
- Around 80% of trucks will be equipped with either electric batteries or decarbonised hydrogen fuel cell for the most demanding uses. The exact proportion of use of these two power sources is still unknown.



### THE ALTERNATIVE FUEL SOURCES OFFERED BY RENAULT TRUCKS



#### XTL/HVO\*

Up to 90% CO<sub>2</sub> reduction from the well to the wheel (HVO)

#### B100

- 60% CO<sub>2</sub> reduction from well to wheel

#### ELECTRIC

- 95% CO<sub>2</sub> reduction from well to wheel  
Zero direct emissions and significant noise reduction

#### CNG\*\*

- 10% CO<sub>2</sub> reduction from the well to the wheel

\*Liquefied synthetic fuels. These may be derived from fossil sources (no CO<sub>2</sub> savings), or renewable sources (from biomass) or BTL (vegetable oils - HVO). XTL and HVO have different methods of production. \*\*-80% CO<sub>2</sub> reduction from the well to the wheel with Bio-CNG; 10% with standard CNG.



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**OUR SOLUTIONS TO HELP YOU  
SWITCH TO ELECTRIC VEHICLES**



**WE DELIVER 360° SOLUTIONS**

**Go for carbon neutrality and we will support you!**

Energy transition in your business operations may appear to be a long, time-consuming process. Renault Trucks can combine its skills and experience to help you throughout your decarbonisation journey. We can provide input to your strategic planning, set suitable decarbonisation goals with you, and offer you turn-key solutions to achieve them.

*With Renault Trucks, you never have to go it alone to switch to carbon neutrality!*

**Customised solutions**

We offer over a comprehensive approach, broken down into four stages:



- 1 Renault Trucks can help you to develop your carbon reduction plan by assessing and identifying your specific requirements. We offer the benefit of our extensive knowledge of current solutions and an understanding of your business needs.
- 2 Renault Trucks will carry out a thorough assessment of your operations by evaluating your fleet and its assignments, as well as your site's existing electrical facilities. Based on these factors, Renault Trucks will provide you with a detailed recommendation which includes an implementation plan along with a forecast of your potential reduction in CO<sub>2</sub> emissions. Our simulation tools make decision-making easier and allow you to track your business more effectively.
- 3 Renault Trucks will work with you in creating your new electric mobility eco system, assisting with financing and public subsidies, designing and configuring the vehicle including accessories, bodywork, charging station, and maintenance contracts. You will also have the opportunity to test an electric truck in your own operating environment.
- 4 Renault Trucks is your key partner in scoping out, supporting and optimising your decarbonisation solution, from installing a charging station, to training your drivers and fleet managers. Our network will help you manage your fleet operations with vehicle connectivity. We can monitor your charging station and energy consumption, recommend routes, and enhance your maintenance operations.

**EVERYTHING IS A PLUS**

Using an electric vehicle engenders many positive effects: the absence of, or a drastic reduction in, emissions of CO<sub>2</sub> and pollutants (e.g., NO<sub>x</sub>); an improved company image and reputation; comfort and driving pleasure for drivers; silent inner city driving conditions; and a reduced overall environmental impact.







## BATTERIES AND CHARGING CUSTOMISED TECHNOLOGY SYSTEMS

### Reliable, robust batteries

The hi-tech batteries used in our Renault Trucks E-Tech electric vehicles offer cutting-edge technology, have an optimised working life, and provide first-class energy use performance levels.

Renault Trucks is the only manufacturer that contractually guarantees the performance of its batteries with our Battery Promise.

### Cutting-edge technology and optimised working life

Our batteries use a lithium-ion technology with proven reliability. Our quality control procedures include extremely demanding cold and heat resistance tests, both in the lab and in actual operating conditions.

Another benefit: our long lasting batteries ensure long-term operational use and optimal charge maintenance.

**i** *Renault Trucks is the only manufacturer to contractually guarantee the performance of the batteries.*

### Battery management as part of a circular economy

After an initial life of 6 to 10 years depending on its usage, a battery can be reconditioned as a standard replacement battery for trucks, offering the same level of performance as a new one.

Even when used, a battery and its components, still retains a significant energy storage capacity, which means it can continue to function for up to ten years for static use, such as residential purposes.

Finally, when it can no longer be used, a battery can be recycled and salvaged materials can be used to produce new ones.



## WITH OUR RENAULT TRUCKS E-TECH RANGE, TAKE YOUR ELECTRIC POWER REVOLUTION EVERYWHERE

As a pioneer in electric vehicles, Renault Trucks offers you the broadest choice of electric vehicles in the market.

With our Renault Trucks E-Tech range (from 3.1 to 26 tonnes), you have a wide choice of models to fit many different types of bodies: van, refuse collection, refrigerated or dry cargo, tipper, skip loader, tipper crane, hook loader, passenger transport.

Renault Trucks E-Tech Master models (3.1 t and 3.5 t), Renault Trucks E-Tech D models (16 t) and Renault Trucks E-Tech D Wide models (19 t and 26 t) cover 90% of urban and urban area uses, from the delivery and distribution of goods to trash collection and initial construction project works.

Regardless of the restrictions being implemented in urban areas, our Renault Trucks E-Tech electric vehicle range preserve air quality and reduce congestion in city centres. In fact, our vehicles make out of hour, silent deliveries possible, without producing direct air pollutant emissions.

In 2023, we will also expand that offering with Renault Trucks E-Tech T and C heavy-duty trucks, designed for regional distribution and construction works.





[renault-trucks.com](http://renault-trucks.com)