

**RENAULT
TRUCKS
DELIVER**

**COMMITMENTS, ACTIONS
AND PROPOSALS IN FAVOUR
OF THE ENVIRONMENT**

CORPORATE COMMUNICATIONS

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COMMITMENTS, ACTIONS AND PROPOSALS IN FAVOUR OF THE ENVIRONMENT

Contributing to sustainably reducing the impact of road haulage on the environment is one of the major challenges facing Renault Trucks along with all players in this sector. However, this aim brings us up against several contradictions. For in spite of the increasing need for mobility of merchandise, we need to take into account the heightened sensibilities of public opinion to the nuisance its transport involves. This becomes a real challenge for a society in which citizens refuse what consumers demand against a backdrop of concerns about road safety and pollution.

Renault Trucks' activity – mostly assembly – is not a particularly polluting activity. On the other hand, the use made of the vehicles it produces does generate nuisance. Renault Trucks therefore commits major human and financial resources to reducing it throughout the truck's lifecycle.

The truck industry has achieved remarkable results in terms of immediate vehicle pollution reduction. In Europe, the successive application of a series of 'Euro' standards has led to a spectacular reduction in road haulage emissions in spite of increased traffic.

Since 1990 and the introduction of the first standard (Euro0), emission levels have been reduced between 5 and 20-fold depending on substance: nearly 90% for nitrogen oxides (NOx), un-burnt hydrocarbons (HC) and carbon monoxide (CO) and nearly 95% for particles (PT). Overall, over a period of 15 years, for a vehicle x kilometer ratio which has increased by nearly 40% in Europe, emissions have fallen by over a half!

Finally, faced with the planetary challenge of climate change linked to CO2 emissions, Renault Trucks continues with its efforts to offer increasingly fuel-efficient vehicles and alternatives to diesel. The company is developing concrete proposals and taking part in joint initiatives with all stakeholders from the road haulage sector.

In order to contribute to the identification of efficient and sustainable transport solutions, Renault Trucks applies an environmental policy which is based on precise commitments and a rigorous management system. For Renault Trucks, environmental protection is a key factor for improvement.

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A COMMITMENT TO THE ENVIRONMENT

Four strategic themes

Renault Trucks is implementing an environmental policy based on four strategic priorities:

- ISO 14001 certification for all of its industrial and tertiary sites and for its suppliers
- The development of new technologies and new lower fuel consumption products with a minimal impact on the environment
- The reduction of nuisance and protection of natural resources on sites
- Fully transparent communications on environmental policy and its results

Acting and convincing

In each of its production units, Renault Trucks is running an environmental management system with the constant aim of getting all staff members involved in and committed to environmental protection.

■ Individual habits for a shared cause

Renault Trucks is rolling out a major information and awareness-raising strategy targeting its employees (communications campaigns, environment information points and posters in basic work units [BWUs], etc.) to help people understand the environmental challenges we are facing. In their workplaces, staff adopt good daily practices such as turning lights off when natural light is sufficient, adapting heating levels and turning off computers at the end of the working day.

Production plant organisation commits everyone to protecting the environment: each site has an environment network with precisely defined responsibilities and missions (site director, managers, environment manager, environment officers and environment correspondents in the BWUs, with real responsibilities in the day-to-day life of the plant). The environment department of Renault Trucks sees to it that good practices are implemented on all sites and that employees get involved in a process of ongoing improvement.

■ Environmental management as a lever for improvement

Renault Trucks' environmental management system (EMS) ensures that the production resources manufacture under optimal environmental conditions on and around its sites, while at the same time accurately managing its water and energy needs. Coordinated by the Secretariat General, the EMS is based on a bespoke organisation whose objective is to delegate as much responsibility as possible at all levels of the organisation.

A set of documents and actions accompanies and structures implementation of the EMS:

- The company environment manual (CEM) describes the company's environmental management system
- Sector-based environment reports (SER) feed down the content of the above to individual entities
- An environmental management programme contains improvement measures to be implemented in each entity
- A regulatory watch maintained by the environment department
- A managed documentary system containing procedures and operational instructions
- A surveillance and measurement plan containing regulatory and operational controls
- An emergency plan giving us the capacity to react in emergency situations which specifies suitable approaches to adopt
- Objectives posted in all sectors.

■ ISO 14001 certified sites

Each of Renault Trucks' tertiary production sites is ISO 14001 certified¹. This certification requires three-yearly renewal audits. Its ongoing improvement process in favour of the environment is deployed in four phases:

- Planning: objectives are established site by site after an analysis of the activity's environmental impact and research into regulatory obligations. An environmental management programme is then drawn up
- Programme implementation and operation: leads entities towards operational management of their actions in favour of the environment and a capacity to forecast emergency situations and react to them efficiently
- Control: compiles reports on actions in order to detect any non-compliance and guide audits as a result. Once certified, each entity undergoes a renewal audit every three years and a monitoring audit annually carried out by a certified agency
- Corrective action: shortcomings identified during the various checks are subject to specific improvement measures being taken for sustainable compliance with ISO requirements.

¹ The international ISO 14001 standard was created in September 1996 under the auspices of the International Standards Organisation. It prescribes requirements relating to an environmental management system (EMS) which allows companies to formulate policies and objectives which take into account legal requirements and information on substantial environment impacts.

The Bourg-en-Bresse plant, located on a 'green site', was the first Renault Trucks site to obtain ISO 14001 certification, in June 2001. Numerous measures contributed to this result: staff training , pilot projects for at-source sorting of ordinary industrial waste (OIW), installation of retention tanks, safety cabinets for storage of chemical products, anti pollution equipment, etc. To date, 94% of ordinary industrial waste is recycled or reused.

■ Involvement of the network, suppliers and partners

The service life of the truck is also subject to the close attention of Renault Trucks. Maintenance and repair are activities which generate waste and the company's commitment is shared by all its partners. Renault Trucks has set up an operational environmental standard for its entire network (1,500 sales and service points throughout the world in over 100 countries) which respects precise criteria linked to waste sorting, consumption of energy and prevention of environmental risks. Renault Trucks therefore asked its suppliers to be ISO 14001 certified or to commit to an ongoing improvement process.

■ Recycling from the design phase onwards

The design of Renault Trucks vehicles takes end-of-service-life recycling into account. It is based on a selection of materials which do not contain undesirable substances and are chosen in line with existing recycling options. Parts are clearly marked according to their nature and access to components is carefully managed to facilitate removal. The whole range of current vehicles is over 90% recyclable. Also, Renault Trucks is committed to developing partnerships in order to increase the recovery level of vehicles at the end of their service life.

PRACTICAL ACTIONS

'Clean' trucks made in 'clean' plants

Renault Trucks' manufacturing sites are energy efficient and natural resource efficient. They force down waste and process their liquid and gaseous discharges. The production resources and processes have been modelled in order to manufacture vehicles in 'clean' plants which are organised in such a way as to reduce waste production.

Renault Trucks achieved 47% energy savings per unit produced between 2003 and 2008 by opting for higher performance technologies (new processes, more economic lighting, new boilers, improved insulation, new access gates, double glazing, etc.) and by introducing behaviour-related initiatives (reduced heating at night, shut-down of certain compressors at the weekend, less equipment on standby, etc.).

The company is also committed to developing renewable energy production with, in particular, the introduction of photovoltaic units on buildings and the installation of solar panels and car parks on certain sites. Renault Trucks attaches great importance to the protection of water resources and has reduced consumption per unit produced between 2003 and 2008 from 50m³ to 14m³.

The Vénissieux site (Rhône) implemented an alternative fluid incineration approach in 1996 for cutting fluids and used detergents: a first in Europe. Limoges is the only European site with a unit exchange



activity operating on the basis of “zero liquid discharge”. The Blainville plant (Calvados) opened a new cataphoresis and mastics unit in 2005 which marks a remarkable step forward in terms of surface treatment and waste management. A new paint shop with its own natural reserve was opened on this site in 2009. This will reduce COVs from solvents by 25%, electricity consumption by 20% and gas consumption by 50%.

Numerous initiatives have achieved substantial waste recovery results on the different sites: reduction of waste and systematic sorting are some of the day-to-day concerns of each and every individual. Plants recycle or recover 94% of ordinary industrial waste (OIW). The use of biotechnologies in the treatment of paint sludge has been generalised and has resulted in it being reduced by 40%.

In 2010, Renault Trucks kept on improving energy efficiency by equipping a new workshop at the Bourgen-Bresse plant with heat pumps, photovoltaic panels and "intelligent" natural lighting.

Protecting air quality: meeting the challenge

Spectacular progress has been made in reducing pollutant emissions in heavy-duty truck engines. Coming into force in 1990, the so-called ‘Euro’ European standards require manufacturers to bring in regular reductions in emission levels of atmospheric pollutants (nitrogen oxide, particles, un-burnt hydrocarbons and carbon monoxide). As a result, all vehicles manufactured since October 1st 2009 meet the Euro V standard. These standards are very swiftly updated with more stringent requirements, and Renault Trucks is currently preparing for the future Euro VI standard which will become obligatory in 2013.

With these regulations, NOx emissions have been cut by 90 % and particle emissions from trucks have fallen by 95% over a 20-year period.

Respecting these standards requires considerable financial and technical efforts on the part of the manufacturer. So as to ensure its engines comply with the most recent standards, Renault Trucks has opted for SCR technology (selective catalyst reduction). The SCR system converts nitrogen oxide into water vapour and harmless nitrogen via a solution of urea which is injected into the hot gas exhaust line. Thanks to this technique, the engine maintains performance while at the same time reducing Diesel consumption.

Even more demanding than Euro V, the EEV (Enhanced Environmentally friendly Vehicle) standard is currently the strictest in terms of polluting emissions. Renault Trucks offers an EEV compliant solution for practically its entire range. This satisfies customers wanting to develop their activity in restricted access zones, limited to cleaner vehicles, or simply preferring to limit their environmental impact.

Controlling CO2 emissions: a major new challenge

Directly linked to the consumption of fossil fuels, CO2 emissions contribute to the greenhouse effect which is a cause of global warming. This is at present the major environmental concern for the road haulage industry. It presents a dual challenge: reducing fuel consumption, i.e. improving the energy performance of trucks and therefore limiting CO2 emissions on the one hand, and reducing the use of hydrocarbons to save precious resources on the other.

In general terms, road haulage already operates on a low CO2 emission regime, with healthy operations for any haulier requiring the lowest possible Diesel consumption. Meanwhile, manufacturers have been playing their part by constantly improving trucks' productivity and making them more energy efficient. Thus, since 1960:

- The average speed of trucks has doubled;
- Their power ratings have practically tripled;
- Their average consumption has been cut by 50%.

Renault Trucks has fitted its vehicle ranges with a new generation of particularly efficient engines. To help hauliers improve profitability, Renault Trucks offers Optifuel solutions, a set of products and services including a rational training course (Optifuel Training) and a vehicle operation data measurement and analysis tool (Optifuel Infomax) which allows detailed monitoring of its use and its diesel consumption.

In 2009, Renault Trucks created an industry first by putting the Premium Optifuel on the market: a 4x2 Premium Long Distance Euro V 460hp tractor equipped with all options to enhance fuel savings, accompanied by Optifuel Training and Optifuel Infomax. Comparative tests in operating conditions between a standard vehicle driven by non-trained drivers and the Premium Optifuel driven by others having followed the Optifuel Training programme showed fuel consumption differences of 6.4% which was certified by the TÜV agency.

Finally, as part of its research effort, Renault Trucks has developed an Optifuel Lab demonstration vehicle which proves that consumption gains in excess of 10% are possible through in-depth work on the aerodynamics of the whole tractor / semi-trailer rig.

Developing alternative energies

Renault Trucks is developing and offering vehicles using substitution energies identified by the Clean Tech label in the belief that a single solution just does not exist. We will only find an alternative to all-Diesel by seeking combined technologies or suitable solutions for the various types of road haulage applications.

■ Electricity

From an ecological point of view, this is an energy which produces no pollutants or CO2 emissions and renders vehicles silent.

In partnership with the French company PVI, Renault Trucks has developed an all-electric vehicle offering based on the Renault Maxity model. These offer two very distinctive advantages: The total lack of atmosphere-polluting and CO2 emissions and the absence of any sound pollution. They can therefore be operated at night and in restricted low emission zones.

The Maxity electric can reach a maximum speed of 90 km/h and has an operating range of 100km. It is fitted with an asynchronous motor, a robotised gearbox and latest generation lithium-ion batteries.

■ Hybrid engines

The hybrid Powertrain reconciles the benefits of the diesel engine and those of the electric motor. It is possible to recover and store energy produced during braking or deceleration and use it during start-up: a process which is particularly useful in maintenance and urban transport vehicles (buses, refuse collection and distribution vehicles), with fuel savings of up to 35% depending on applications and conditions of use.

In 2007, Renault Trucks presented the Hybrys, an innovative urban concept vehicle exploiting parallel hybrid technology (an internal combustion engine and an electric motor, delivering power to the wheels according to several distribution scenarios).

Since then three demonstration vehicles developed based on a Renault Premium Distribution Hybrys Tech have been tested under actual operating conditions: a refuse collection vehicle in the Greater Lyon area, another with Coca-Cola Belgium for beverage deliveries, and the last one with the Colas Group for bulk building material tipper transport on urban worksites.



■ The natural gas vehicle (NGV)

The natural gas for vehicles (NGV) primarily consists of methane. NGV engines emit very little NOx and no particles but more un-burnt hydrocarbons than diesel engines, although these are less toxic. The NGV produces little or no unregulated toxic pollutants, compared to diesel. CO2 emissions from NGV vehicles are comparable to those of diesel or even lower, with the same power rating.

Heavy-duty vehicles operating on natural gas for vehicles (NGV) make less noise and emit no smells. They are particularly suited to urban transport (passenger transport, delivery, road works and refuse collection).



PROPOSALS

Working towards sustainable urban goods mobility

Renault Trucks attaches great importance to addressing the environmental nuisance caused by trucks as part of a broader solution to the challenges of mobility in the future. In this respect, its advanced research team has developed an acknowledged body of expertise in the field of goods transport in urban environments.

■ The right truck with the right energy for the right use in the right place

Increasing urbanisation across the globe is making the implementation of sustainable goods mobility in towns an urgent priority.

Renault Trucks has developed its vision of a transport system which respects the environment, preserves energy resources and is better integrated into the urban system. It is based on the following principles:

- Consolidated loads (higher average weight trucks which are efficiently filled to capacity and operate delivery rounds)

- Combination and optimisation of available technologies and energies (diesel, hybrid, natural gas, electric)

- Integration of vehicles into an intelligent transport system (communication between vehicles and infrastructure).

In an ideal world, goods would first be transported in bulk to inter-modal platforms located around urban areas.

In order to connect up these peripheral distribution platforms, the best tool is a tractor and semi-trailer combination with low Diesel consumption. Renault Trucks research into, among other things, rig aerodynamics, shows that it is possible to gain over 10% compared with a standard vehicle and reduce CO2 emissions by an equivalent amount.

From the city centre warehouses, 12 to 26 ton vehicles would take over. They are powered either by natural gas or diesel-electric hybrid solutions. Renault Trucks is experimenting on the ground with hybrid vehicles (Renault Premium) which, compared to conventional vehicles, deliver an immediate reduction of 20% in Diesel consumption and CO2 emissions.

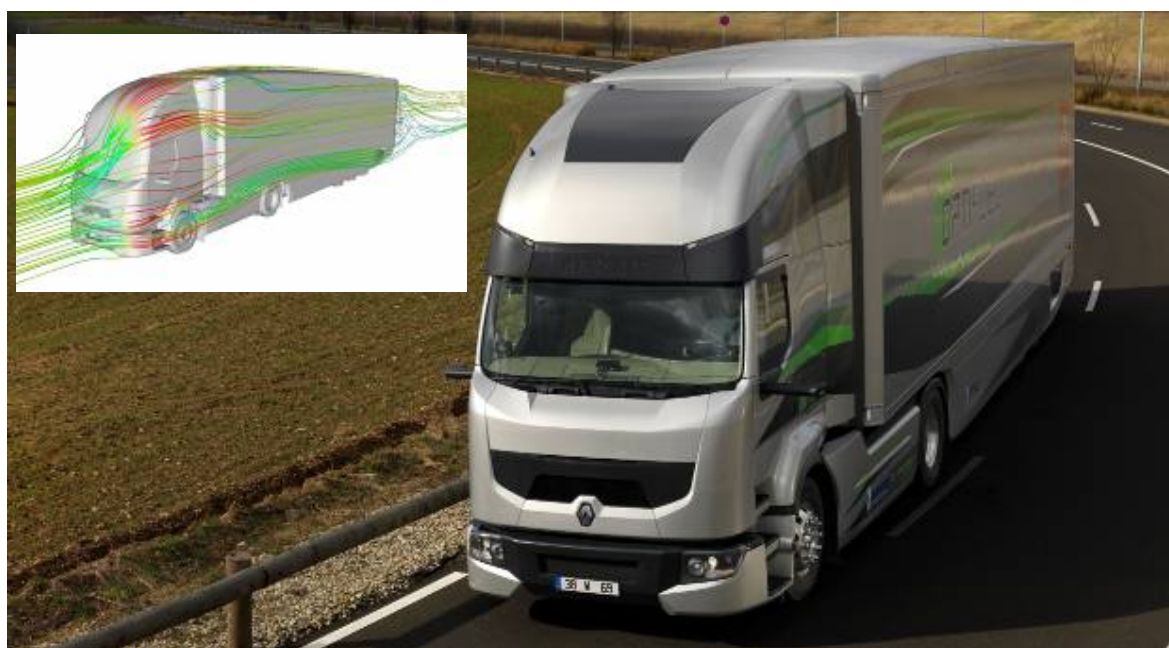
A single medium-duty vehicle which is optimally loaded can effectively replace several lower capacity vehicles: this means fewer traffic jams, less noise, reduced CO2 emissions and pollutants and energy savings. Promoting delivery round-based logistics with such trucks is a guarantee of economic and environmental performance.

The very centre of towns cannot always be accessed by heavy duty vehicles. Small hybrid or 100%-electric trucks (such as Renault Maxity) with high payload capacity are perfectly adapted to cover those final kilometres in narrow or protected areas.

Finally, Renault Trucks is now able to make vehicles communicate with each other, with their base and with infrastructures. Thanks to telematics, trucks can be optimised in an organised, cooperative transport system (guidance, organisation of delivery rounds, reservation of delivery areas, adaptation to environmental performance, driving assistance, safety, etc.).

■ Optifuel Lab: the "laboratory" truck

Convinced that Diesel will remain the benchmark fuel for many years to come, in 2007, Renault Trucks launched its Optifuel Lab research programme. Its main aim is to reduce the fuel consumption and polluting emissions of a rig (tractor plus trailer). It aims to demonstrate that consumption can be significantly lowered by redesigning a rig's aerodynamics, optimising the powertrain and tyres and by offering specific driving aids. Now, after 4,500 km of global trials and measurements on a 2,500 km long route, the project's first phase has enabled fuel savings of 13% to be recorded - or 4.5 L/100 km. Similarly, CO₂ emissions were reduced by almost 120 g per kilometre. All of this has been carried out under real operating conditions and compared with an actual vehicle currently in service (the Premium Long Distance DXi11 450 hp).



■ FIDEUS Project (2005-2008)

As part of the European research programme FIDEUS (Freight Innovative Delivery of Goods in European Urban Spaces), Renault Trucks has developed the first urban distribution vehicle which is properly adapted to its environment. The whole vehicle has been designed to protect the quality of life in urban areas: less noise and less pollution to limit the environmental impact of the vehicle, greater efficiency to reduce its downtime and enhanced safety to protect users of urban roads and goods.

In order to reduce acoustic emissions from the engine as far as possible, the first source of noise in a vehicle, Renault Trucks' service teams have developed a new simulator to define and localise optimal phonic insulation around the engine. The transmission was also given special attention using a structural amortisation technology for composite material. Finally, for the exhaust line, silencers have been entirely revised. Thanks to these innovatory solutions, the noise level of the Powertrain has already been reduced by 3Db(A).

Extending beyond purely mechanical strategies, an innovative solution adapts vehicle mobility to conditions of use. By simply activating a switch when entering an urban area, drivers can initiate an electronic performance control mechanism in the vehicle which is adapted to urban use, resulting in even lower noise levels, gaining an additional 3Db(A). This makes the vehicle four times quieter than a conventional distribution vehicle. In time, this system will be perfectly autonomous. A vehicle equipped with geo-localisation and communications tools integrated into a palm-type pocket computer will detect urban zones on its own and automatically switch to optimal operating modes which correspond to the needs of a particular context.

The vehicle used as part of the FIDEUS project was developed on the basis of a Renault Midlum Euro IV equipped with SCR (selective catalytic reduction) technology. Renault Trucks has experimented with additional mobility management mechanisms in urban areas. As for noise emissions, these systems are designed to automatically detect 'low emission zones' in order to route the vehicle under suitable operating conditions. Furthermore, it allows urban traffic management centres to be informed so that they can check the vehicle's compliance remotely.

10 STATISTICS TO HELP CHANGE THE WAY PEOPLE



THINK ABOUT TRUCKS

- Road haulage accounts for 80% of goods transport in France, 77% in Europe
- Trucks account for 6.5% of traffic in France (in terms of vehicles x kilometre) against 76% for private cars
- Over a period of 30 years, the involvement of heavy duty vehicles in accidents has been reduced 9-fold
- Since 1960, the acoustic impact of trucks has been reduced 12-fold
- Since 1990, in spite of a 40% increase in HGV use in Europe, polluting emissions have fallen by 50% (a reduction which will reach 80% in 2013 when the full effects of Euro IV and Euro V standards will be felt)
- Trucks generate 5% of total man-made CO2 emissions in the world compared to 10% for private cars
- A truck consumes less than 30 litres / 100km to transport an equivalent load to that of 40 private cars
- Since 1960, whilst engine power has tripled, average consumption of heavy duty vehicles has been cut by 50%
- A 40t truck consumes 3.5 litres of Diesel to cover 10km on the flat at a regular speed, and 10 times more, i.e. 35 litres, in congested conditions, involving stoppages every 100 m;
- 75% of road haulage involves distances of under 150km with an average journey distance of 131km.