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Publication: IST.081412  
September 2008  
The data contained in this publication  
are purely indicative and not binding.

SUSTAINABLE TRANSPORT BY IVECO

**IVECO**



# ENVIRONMENT

**IVECO'S COMMITMENT TO ENVIRONMENTAL PROTECTION IS FIRM AND RESPONSIBLE.**

**Sustainable mobility: to satisfy the transport needs of today's generation without compromising the ability of future generations to satisfy theirs.**

Iveco's commitment to the environment is developed over the whole life cycle of its products: from the selection of raw materials and components to the production methods employed, from the characteristics and performance of its vehicles to their recyclability at the end of their useful lives.

**Sustainable mobility for us and for our children.**





**SUSTAINABLE TRANSPORT. A DUTY AND AN OPPORTUNITY.**  
**From energy supply, to vehicles, to the infrastructure.**



Transport adds value and uses resources.

In order to make it sustainable it is necessary to address many key areas, from fuels to technology, from vehicle safety to the safety of the infrastructure.

We are doing it already. For years, for example, we have continually and drastically cut pollution emissions and the fuel consumption of our vehicles.

But it is time to increase the pace.

And Iveco is first in line to meet this challenge.

**TOWARDS SUSTAINABLE MOBILITY**

PROBLEM	SOLUTION
<b>Consumption of natural resources</b>	<ul style="list-style-type: none"> <li>• Diversify the source of energy supply</li> <li>• Maximise energy efficiency</li> <li>• Produce and use renewable energy resources</li> <li>• Reduce industrial and vehicle energy consumption</li> </ul>
<b>Airborne pollution</b>	<ul style="list-style-type: none"> <li>• Use less polluting fuels</li> <li>• Optimise fuel consumed by internal combustion engines</li> <li>• Deal with exhaust tail-pipe emissions</li> <li>• Develop alternative power trains</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>• Improve driving standards and respect the rules of the road</li> <li>• Improve vehicle active safety measures</li> <li>• Improve the road infrastructure respecting the nature of shared roads</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>• Multi-event Diesel fuel injection systems</li> <li>• Low noise tyres / Use of low noise road surfaces</li> <li>• Helical gear trains</li> </ul>
<b>Traffic</b>	<ul style="list-style-type: none"> <li>• Exploit Intelligent Transport Systems (ITS)</li> <li>• Avoid single carriageway roads</li> <li>• Exploit Inter-modal freight transport systems</li> </ul>
<b>Waste</b>	<ul style="list-style-type: none"> <li>• Extract energy from organic waste to develop bio-fuels</li> <li>• Promote recycling and eco-compatible material choice used for vehicle construction</li> <li>• Recycle everything possible at the end of its life.</li> </ul>





## **ECOLOGICAL AND COMPETITIVE.** **In advance of the legal requirement, yesterday and today.**

Iveco introduced to the market vehicles conforming to the Euro V tail-pipe emission standard, in force from October 2009, four years ahead of the legal deadline.

Today, Iveco is already working on possible solutions that will become necessary for Euro VI, with the objective once more to pull ahead the new product availability well before the legal introduction timing for the benefit of customers and the environment.



## **NATURAL GAS AND BIO-FUELS.** **ALTERNATIVES TO PETROLEUM FUELS.** **The first is abundant in nature and, like the second, can be obtained from organic material.**

Reserves of natural gas are relatively abundant compared to petroleum based fuels and give the opportunity to diversify energy supplies.

Besides, natural gas engines are quiet in operation, like petrol engines yet emit low Diesel engine levels of carbon dioxide. These engines are among the most clean available today.

Iveco is the long standing market leader for natural gas commercial vehicles. Its product range includes vehicles commonly used in urban areas: a wide range of buses, Daily, Stralis and, from 2009, also Eurocargo. In total, today there are over 10,000 Iveco natural gas vehicles in operation throughout the world.

But the urgency of our time is an ever growing need to commit to renewable energy: biogas and bio-Diesel, for example.

Biogas - produced from organic waste - side by side and integrated with fossil based gas and it is immediately usable by FPT natural gas engines, just as bio-Diesel, blended with fossil based Diesel fuel by up to 5% can be used in all Iveco Diesel engined vehicles.

The future of bio-Diesel is represented by a second generation bio-Diesel, that is BTL (Bio-mass to Liquid) e HVO (Hydrogenated Vegetable Oil).

Second generation bio-Diesel offers important advantages:

- It allows the use of the whole plant and not just the seeds as happens with first generation bio-Diesel, the raw materials of which are not necessarily destined for food production.
- They can be used by all vehicles in circulation without technical changes necessary to certain fuel system components; they can be made very similar to fossil based Diesel fuel (they lose the characteristics of their vegetable base).
- They offer the advantage of off-setting any CO<sub>2</sub> emitted and reduce NO<sub>x</sub> and particulate matter.
- Second generation bio-Diesel is not in competition with food cereal crops since vegetable waste and woody biomass can be used by the BTL process.

Iveco supports the development of BTL and HVO processes in order to achieve an increased availability of renewable fuels.

On this subject see also the Iveco brochure "New energy in order to remain on track - Natural gas vehicles and fuels".



**ENERGY CONSUMPTION.  
DECISIVE FOR THE ENVIRONMENT AND FOR COMPETITION.  
To transport more and consume less has always been the goal.  
For Iveco it is a primary objective.**



Since the beginning of road transport, energy consumption has been a key competitive element. Trucks and buses have to consume less; Our customers say so.

That is why engines and power train systems are the subject of continuous evolution, the aim being to reduce fuel consumption and hence CO<sub>2</sub> emissions and that requires high investments in research and development.

The Cursor, Tector, S23 ed S30 engines - produced by Fiat Powertrain Technologies and used in Iveco vehicles - are the fruit of this process.

**HYBRIDS.  
THE GREAT  
ENERGY SAVERS.  
Travel with up to  
30% savings in fuel  
consumption  
and CO<sub>2</sub> emissions.**



Europolis series hybrid urban bus.

The synergy between an electric motor and a Diesel engine, the provision of the Diesel engine stop - start and the recovery of kinetic energy under braking give great fuel consumption savings to Iveco hybrid vehicles with respect to vehicles having traditional power train systems. The hybrid solution contributes to reduced noise and improved driving comfort; besides important savings in fuel consumption - under some circumstances - to travel under zero emission, battery power in protected urban areas.

The Iveco range of series and parallel hybrid buses is already in operation in a number of European cities.

Now, this technology is being extended also to goods transport. In 2008, Iveco has initiated a programme of extended customer acceptance trials with its light and medium range of commercial vehicles, the Daily and Eurocargo, in collaboration with a number of important customers.

For urban missions, Iveco offers also the Daily electric; zero emissions, very low noise and a range of up to 120km without stopping to recharge the batteries.

On this subject see also the Iveco brochure "Hybrid vehicles: The Intelligent Alternative".



**IVECO TRANSPORT CONCEPT.  
REDUCING SPECIFIC FUEL CONSUMPTION,  
IMPROVING INTERMODALITY: ROAD-RAIL-WATER.  
With only a minor increase in length, ISO containers  
up to 48' can go by road.**



Iveco Transport Concept.

In order to correctly measure the consumption of a means of transport, it is essential to evaluate the energy required to transport a certain quantity of freight or passengers over a given distance, expressing the result in fuel consumed per tonne-kilometre or passenger kilometre.

The greater the operating mass or volume of the vehicle, the lower will be the specific fuel consumption. For road vehicles sharing road space with other road users however, this can only be exploited where road safety and compatibility with the road infrastructure is not compromised.

With this in mind, Iveco has promoted Transport Concept that proposes a modest increase in overall length of articulated combinations (from

today's 16.5m to 18.0m) but that achieves far from modest results: the possibility to load an extra row of Euro-pallets and would allow the more widespread use of 48' ISO containers.

Despite the increased length, vehicle safety is not compromised, since all advanced safety features are still applicable, and its manoeuvrability still compliant with European requirements.

It is a simple proposal and can be easily implemented, also making inter-modal, road-rail-water, more of a real possibility with increased use of 48' ISO containers serving to reduce overall traffic.

Using to the full the best solutions.

On this subject see also the Iveco brochure "Innovation for the future: the future is here - Transport Concept".



**RECYCLE.  
REAL LEGENDS  
NEVER DIE.  
Vehicles dismantled  
provide material to  
construct new ones.**

European regulations demand that vehicles up to 3.5 tonnes of gross mass be recycled by 95% of their kerb mass by 2015. The Iveco Daily is already very near to this target today.

In Iveco the definition of new product 'basic requirements' takes serious account of product recyclability and component suppliers are involved at an early stage in the choice of materials to ensure satisfactory disposal at the end of the vehicle's life.

Iveco has selected a network of vehicle dismantlers in each EU Member State to carry out the depollution and dismantling of Daily range vehicles at the end of their life without any cost to the vehicle owner. This process is managed in an environmentally friendly way in accordance with the legal requirements.



# ROAD SAFETY

## THREE STAKEHOLDERS: VEHICLE, DRIVER, INFRASTRUCTURE.

Iveco is committed to the continuous development and application of advanced vehicle safety features on its range of vehicles.



Iveco continuously improves vehicle safety and the quality of life on board its vehicles in order that the driver is always able to maximise his attention on his driving task.

One example is the fully automated transmission, EuroTronic, that makes the driving task more comfortable and less onerous.

In totally automatic mode, the driver is only required to steer, accelerate and slow down the vehicle because EuroTronic manages the clutch operation and selects the gear and effects the gear change. This means that the driver's hands need not leave the steering wheel and his eyes the road ahead.



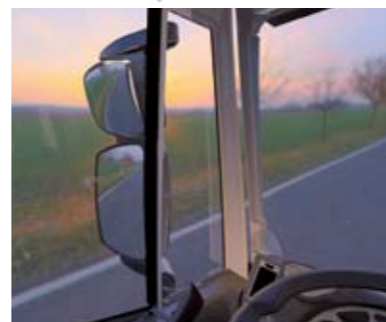
Control panel for the automated transmission EuroTronic. It allows the management of the transmission in either partially or fully automatic mode, with a special feature for very low speed manoeuvring.



By analysing the cab structure and its resistance to deformation it is possible to evaluate the risk to the driver and his passenger under a wide variety of road accident scenarios so influencing cab design.



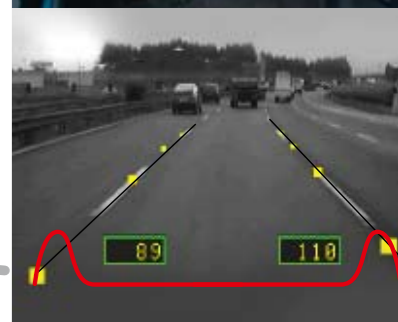
The simulation of internal cab reflections on the windscreen or side windows is an advanced study known as visual ergonomics.



Iveco has developed and introduced on its vehicles advanced driver assistance systems (ADAS) that serve to warn the driver of possible dangers to him and other road users by means of both audible and tactile alarm systems. Systems such as Active Lane Warning System and Autonomous Cruise Control providing frontal anti collision warning to cite just two are very recent developments but are indicative of tomorrow's technological developments.



The Active Lane Warning System alerts the driver of inadvertent lane departure by means of a steering column torque resisting the manoeuvre and so alerting the driver.





## SUSTAINABLE TRANSPORT FOR IVECO MEANS...



- Ecology and competitiveness
- Continuous improvement to the Diesel engine
- Reduction of pollutant emissions and of CO<sub>2</sub>
- Alternative traction and renewable fuels
- Integration of transport modes
- Vehicle end of life recycling
- Integrated approach to road safety