# Nature
# travels by train

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# Trains protect the climate

In Europe and by definition in Italy, the transport industry has the most responsibility for energy absorption and the carbon footprint. The transport industry is responsible for 24 percent of greenhouse gas production in the 27 EU countries, and 26 percent in Italy – about one quarter of the total; the EU energy need touches on 32 percent, 34 in Italy, equalling about one third of total absorption.

Still, railway transport plays a very minor part in contributing to those figures: only 2 percent of the total. For the same distance, the energy required by a train to carry passengers or freight is respectively one third and one eleventh of the energy needed for road and air transport. And every train traveller produces an average of 76 percent less greenhouse gas than plane travellers and 66 percent less than car travellers.

Which is why in the overall scenario, trains are the most responsible and sustainable choice to protect the environment and improve the quality of living and of the air.

# Environmentally friendly High Speed

The Turin-Salerno High Speed/High Capacity network, operating since December 2009 is the most important and extensive post-WW II work completed in Italy to date. The new tracks have a low environmental impact: more than one million plants have been sown on the Milan-Bologna route alone, helping to offset the large amounts of  emitted into the air.

The HS results are a concrete example of the ecological advantages to the environment. At the end of 2009, the average number of Frecciarossa registered travellers increased by about 25% compared to 2008, and the market share between Rome and Milan rose from 38% to 50% with a subsequent saving of about 30 thousand tonnes of CO2. A considerable and constantly growing benefit, as revealed by the figures. After the opening of the entire Turin-Salerno rail track, about 13 million travellers chose the Italian HS in the first eight months of 2010 alone, by far exceeding the total number in 2009.  The Rome-Milan and Milan-Naples routes in particular continue to record the highest volumes of traffic: compared to 2009, passenger numbers have increased by 22 percent on the former and 26 percent on the latter.

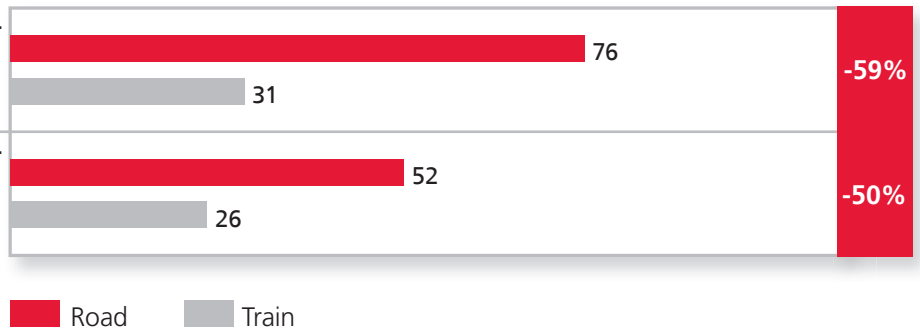
230 km of noise barriers
> 780 km new viability and road by-passes
> 1670 hectares of green operations
> 300 volunteer agreements for the social and environmental inclusion of the work
> About 25% of investment for social and environmental expenses

# Trains are the most ecological way to go

## Road-train comparison

**Average $CO_2$ emissions per passenger (kg $CO_2$/pass)**
Napoli centrale - Milano centrale

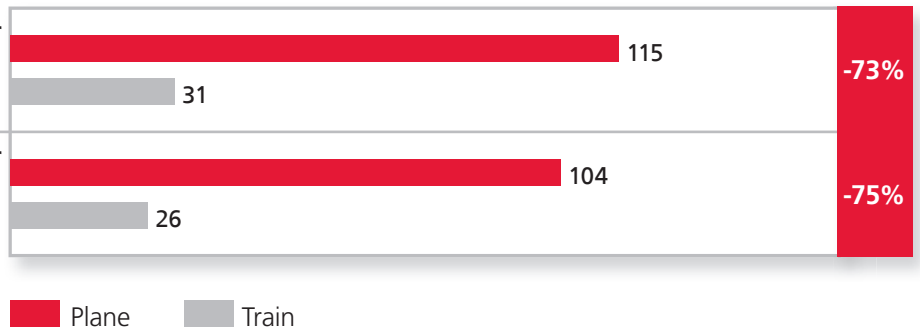
**Average $CO_2$ emissions per passenger (kg $CO_2$/pass)**
Roma Termini - Venezia S.L.




## Plane-train comparison

**Average $CO_2$ emissions per passenger (kg $CO_2$/pass)**
Napoli centrale - Milano centrale

**Average $CO_2$ emissions per passenger (kg $CO_2$/pass)**
Roma Termini - Venezia S.L.

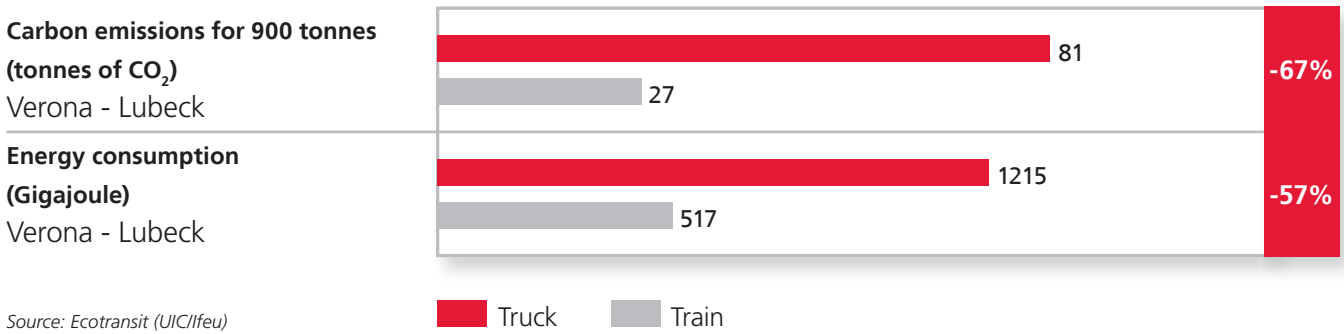



A recent study by ENEA (Italian agency for new technologies, energy and the environment) on long-distance passenger transport, processed on the basis of 2008 traffic and fleet figures on the Roma Termini-Venezia Santa Lucia and Napoli Centrale-Milano Centrale stations showed the following average CO2 emissions per passenger:

The ENEA study of metropolitan passenger transport in Rome and Milan (2008 data) shows that in terms of CO2 emissions produced, railway transport is four times more efficient than private automobile transport. On the other hand, the comparison with public on-road transport showed they were basically the same in environmental efficiency, although road transport has a greater effect on traffic congestion. Furthermore, pollutants are produced in densely populated urban areas, unlike the power stations that supply railway transport, in most cases situated in suburban zones with a low population density.

For a load of 900 tonnes, on the Verona-Lubeck line a train emits about 67% of CO2 less into the atmosphere, eliminating about 35 trucks from the roads and helping to ease congestion on the large road links. There is also an energy saving of up to 57 percent.

## Truck-train comparison




*Source: Ecotransit (UIC/Ifeu)*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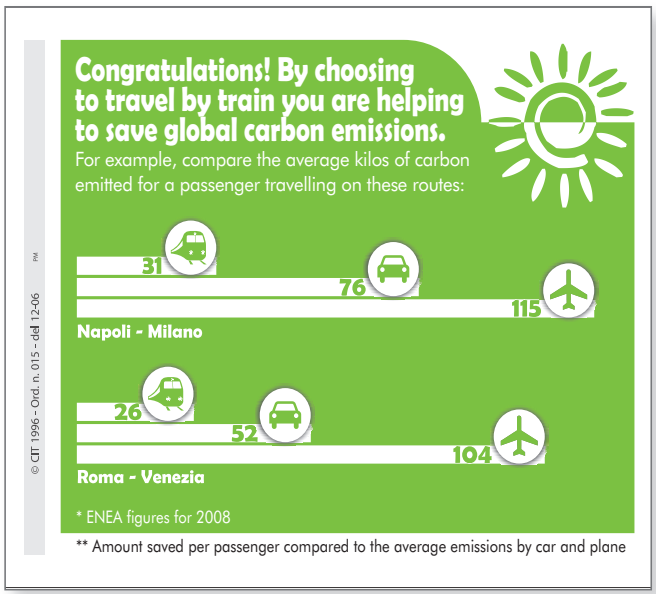
# Ecological ticket and green points

Railway tickets issued since June 2010 also provide information on the environmental advantages of trains. A comparison of the average carbon emitted for the same journey by train, car and plane can be found on the backs of tickets issued at Trenitalia ticket counters.




For each journey by Trenitalia fidelity card holders, the carbon emissions saved compared to other methods of transport are converted into green points that are added to the normal fidelity points used to obtain free tickets or rewards from the catalogue.

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# Trains are the central element of increasingly sustainable mobility

The estimated growth in the demand for mobility in Europe will inevitably lead to a considerable rise in energy consumption and carbon emissions.
In this scenario, the low environmental impact guaranteed by trains is the perfect solution to keep subsequent damage down.

# Development of the railway infrastructure in Italy

One of the fundamental levers for sustainable rebalancing of the Italian transport system within the most significant commitments undertaken by the FS Group consists of the operations to develop railway links in the most highly populated areas. Indeed, the flow of railway traffic overall and the possibility of redesigning urban mobility, now congested by road transport, depends on the efficiency of the links.

For big cities crossed by fast lines, the new infrastructure is the linchpin of transport reorganisation. The HS network and traditional network connections also offer functional alternatives for passenger trains and lay the groundwork to optimise freight transport. Within the big railway links, constructing new specialist lines for long-distance traffic will clear existing connections, benefiting commuter transport and improving the quality of the air we breathe.

# The FS Group at the world climate change conference

At Copenhagen 2009, the world climate change conference, a travelling conference was organised on board the Climate Express to support awareness of the impact that transport has on the environment and to demonstrate that trains are the most viable solution to this problem.

On the special train, together with environmental experts and Railway delegates from all over the world, the Ferrovie dello Stato also testified to the value of trains as one of the most eco-sustainable methods of transport and to its capacity to combine an efficient mass transit system with minimum carbon emissions and high safety standards.

# The Pact for the Environment

The importance that railway transport plays in reducing harmful emissions and increasing energy efficiency is acknowledged in the 2009 programme agreement signed between the Italian Railways (FS) and the Ministry of the Environment and of Protection of the Territory and the Sea, whereby the FS group undertook to contribute to reaching the targets defined in the European "climate and energy package" in the mid-long term.

The agreement falls within the broader "Pact for the Environment" programme promoted by the Italian government and signed by the FS group and by another ten large Italian companies; the targets show that they are committed to keeping down energy consumption and developing an increasingly safe and eco-sustainable method of transport. Within this area, the FS group has also resolved to reduce carbon emissions by 2012 and to adopt energy production systems from renewable sources in its systems and buildings. Structural investments and fleet renewal are also continuing to develop an increasingly safe and eco-sustainable method of transport.

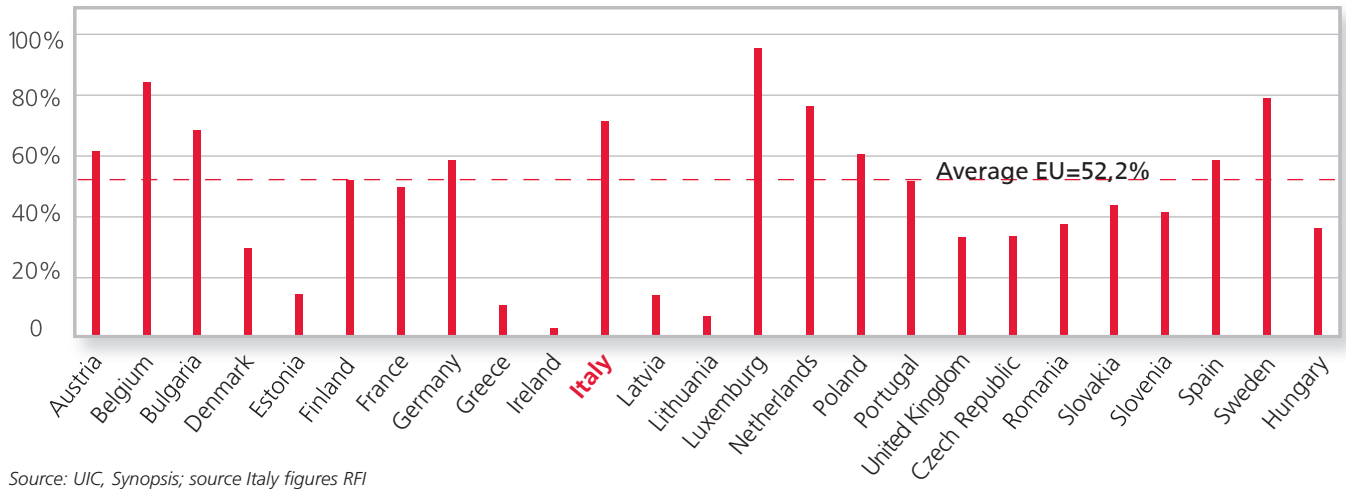
# Electrification in Europe and the Italian case

The average rate of electrification in European countries is 52.2 percent, while the figure referring to the Italian railways equals 71.2 percent. Apart from far outclassing the European average, the Italian network also exceeds the rates of other large European networks such as France and Germany.

With over 11,900 km of electrified lines, more than 70 percent of the total, the Italian railway network has one of the highest electrification rates in Europe. In the last 16 years, more than 1,600 km of FS lines have converted from diesel to electric traction, with an overall increase of 12.2 percent. This has completely wiped out local emissions of PM10 and the greenhouse gas production has been reduced by a further 25 percent.

Electric traction has two advantages: apart from being cleaner, it can also integrate the use of the new sources of renewable energy that will be produced in Italy in the coming years. This is why a programme that began in 2007 and that will conclude in 2011 involves changing the traction on another 420 km of lines.

## Rate of electrification in the European Union




*Source: UIC, Synopsis; source Italy figures RFI*

# Reducing noise pollution

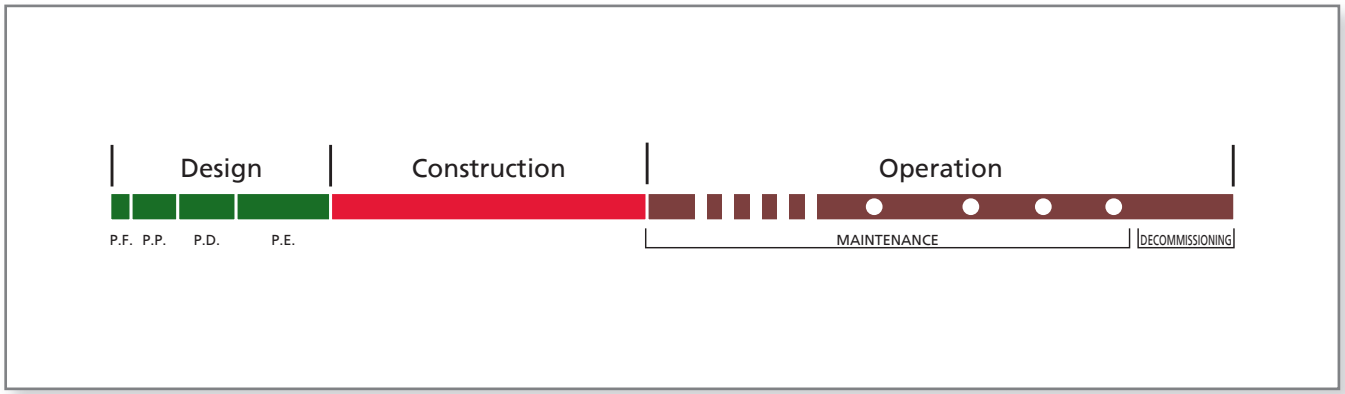
Different actions have been implemented to keep down noise pollution caused by railways, particularly on the lines, by installing sound absorbing barriers. RFI is one of the first European network operators to create noise maps of the territory, paying special attention to sites that the law defines as “sensitive receptors” (schools, hospitals, nursing homes etc.) and more than five years before the deadline set by the EU directives. The Noise Control Plan derives from the mapping and involves:

- installing about 3,500 km of noise barriers along the railway lines;
- completing about 3,200 direction actions on isolated or sensitive receptors.

# A modern infrastructure through eco-sustainable design

The FS Group has developed its own in-house method of measuring the greenhouse gases (GHG) produced, enabling designers to come up with solutions that can reduce, prevent or mitigate emissions while providing the same efficiency, thus making it real eco-sustainable design.

The method sets a standard based on scientific criteria to measure GHG emissions generated by the design and construction of the infrastructure, through to railway line roll-out and operations.




# High Sustainability trains, the traction of the third millennium

The Group pays a great deal of attention to the impact of energy consumption and this converts into an articulated sustainability plan. The use of increasingly efficient methods has made it possible to basically keep specific consumption at the same level, despite the supply of more services.

One of the initiatives that was initiated some time ago is the "Railenergy" programme that aims to attain a 6 percent reduction in the specific energy consumption of the railway system by 2020. One of the projects implemented for this is the development of a tool that can assist efficient driving without increasing the travelling time. Indeed, the system helps drivers minimise acceleration and deceleration between stops; this reduces both the energy consumption required for traction plus the wear and tear on the braking system.

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