



Piazza della Croce Rossa, 1  
00161 Roma  
[www.ferroviedellostato.it](http://www.ferroviedellostato.it)



Nature travels  
by train



---

Nature  
travels by train





Nature travels by train

---





## Environmental Pact

*“ FS Group pledge to cut CO<sub>2</sub> emissions, increase use of energy from renewable sources, and optimize waste management. ”*

An agreement was signed on 7 July 2009, binding the Italian National Railway (Ferrovie dello Stato) and the Ministry for the Environment to a pledge to cut CO<sub>2</sub> emissions by 600 tons/year before 2012 and to introduce energy generation systems powered by renewable sources in plants and buildings, the overall effect being a substantial reduction in the impact on the environment, lower consumption and running costs.

The agreement is part of the wider “Environmental Pact” programme promoted by the Italian Prime Minister’s Office and the Ministry for the Environment, and backed by a further ten Italian businesses as well as the National Railway organisation. The objectives of the Agreement are testament to the FS Group’s commitment to cutting energy consumption and implementing a structural investment plan and renewal of its rolling stock to develop a safer, more ecologically sustainable means of transport.

---

## The climate is safe with trains

Train travel is the means of transport that most respects the environment and the climate. The output of greenhouse gases is very low, energy savings are possible and the effect on global warming is minimal. Every day, millions of Italians choose to go to work, school or university by train. This is a responsible choice that safeguards the environment and improves the quality of life and of the air that we breathe. The numbers obtained in scientific studies in fact speak loud and clear. Each passenger travelling by train in Italy generates 76% less greenhouse gas than someone who chooses to fly, and 66% less than someone travelling by car. **CO<sub>2</sub> emissions for a rail trip in Europe are about one third of those for a road or air trip.** One third less energy is also needed to travel by train than to go the same distance by car, and one eleventh less than to fly. In Italy, transport and travel accounts for 30% of total greenhouse gas emissions. In this total, rail travel generates just 2%, in other words, 15 times less than the emissions of other forms of transport, primarily from the bottlenecked cars blocking up our cities.

Nature travels by train

---

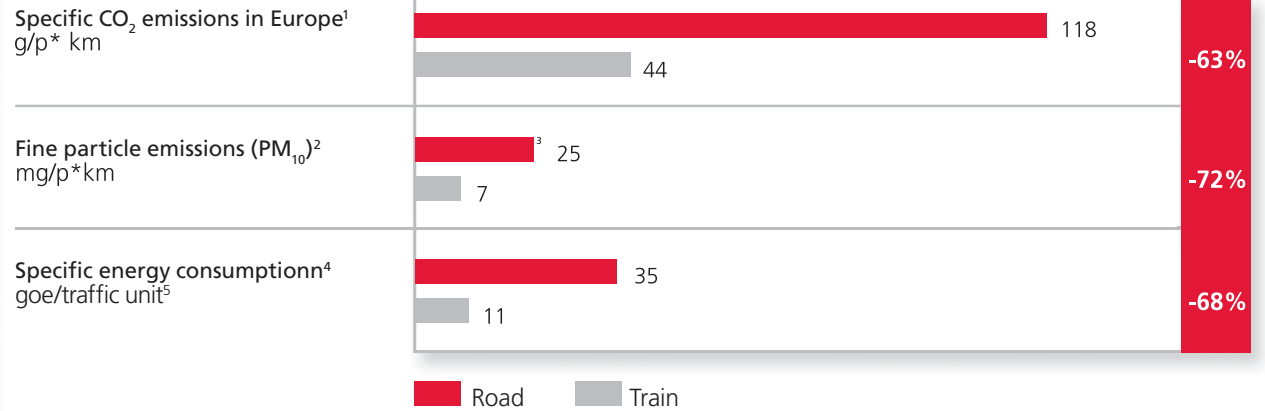






## Train travel is the most ecological way to go

### Road-rail comparison



<sup>1</sup> Source: IWWI INFRAS 2004 study (Europe 2000)

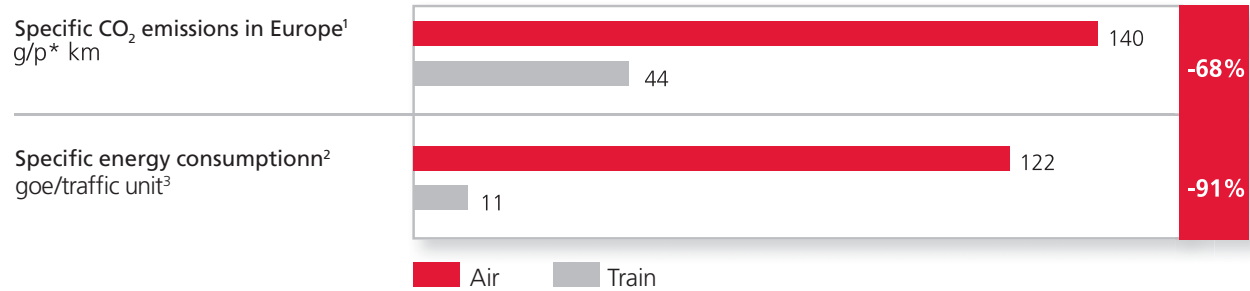
<sup>2</sup> Source: 5th report "The environmental and social costs of mobility in Italy", Amici della Terra e Ferrovie dello Stato

<sup>3</sup> Just cars

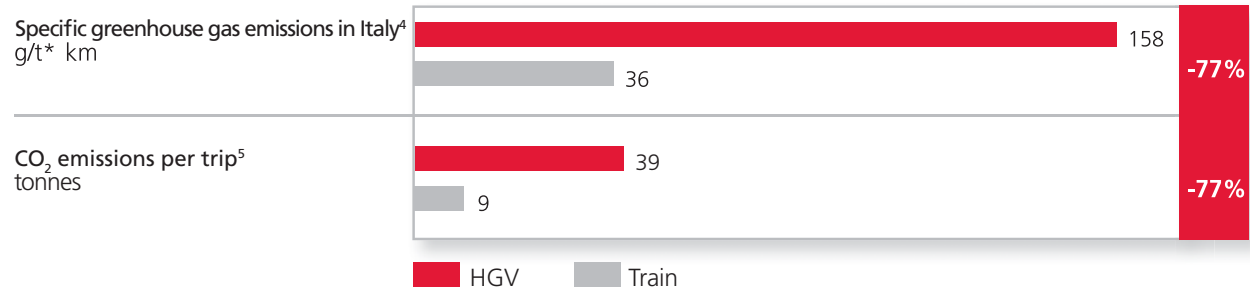
<sup>4</sup> Source: European Commission document - DG Energy and Transport - update 2005

<sup>5</sup> gram oil equivalent / (p\*km+t\*km)

## Air-train comparison



## HGV-train comparison



<sup>1</sup> Source: IWWI INFRAS 2004 study (Europe 2000)

<sup>2</sup> Source: European Commission document - DG Energy and Transport - update 2005

<sup>3</sup> gram oil equivalent l (p\*km+t\*km)

<sup>4</sup> Source: 5th report "The environmental and social costs of mobility in Italy", Amici della Terra e Ferrovie dello Stato

<sup>5</sup> Shipment of 300 tons of freight from Gioia Tauro to Stuttgart (1,500km). Source: Ecostransit (UIC -IFEU) study



## Nature travels by train





---

## High speed is friendly towards the environment

The new High Speed / High Capacity service is further proof of how much more ecological rail travel can be compared to travelling by road or air, having achieved yet another reduction in polluting emissions. Before the Frecciarossa made its debut, trains carried 36% of passengers between Milan and Rome, compared with 1% on planes and 13% by car. In the first few months of 2009, the percentage of people on trains grew to 48%, whereas airlines and roads saw their shares fall to 42% and 10% respectively. In some cases, such as Milan - Bologna, trains have largely taken over from cars as the predominant choice: the former rose from 48% to 59% whilst the latter dropped from 49% to 38%.



---

## Moving towards more sustainable mobility

Of the many key pledges that the FS Group is committed to achieving, upgrading rail interchanges in Italy's most densely populated cities is one of the most effective ways of restoring a sustainable balance to the Italian transport system. In fact, the overall smooth flow of rail traffic depends on the efficiency of these connections, as does the possibility of redrawing the urban mobility system which is currently over-congested on the country's roads. For large cities crossed by high speed links, the new infrastructure represents the key to the reorganisation of transport systems. Links between High Speed and legacy networks will also provide effective alternatives for train passengers and a more optimized solution for

goods freight. The new specialist lines for long-distance traffic within large rail nodes will free up existing lines with huge benefits for commuters and for the quality of air we breath. Completion of the HS/HC link from Turin to Salerno in December 2009 together with the upgrading of urban nodes will give another stronger boost to the ongoing process to redraw the balance in the country's mobility, a process championed by the train: **indeed, it has been calculated that more and more Italians will opt to travel by train and leave their cars at home, each doing their bit to reduce the 2.5m tonnes of CO<sub>2</sub> generated every year by the national transport system.**

---

Nature travels by train









Nature travels by train

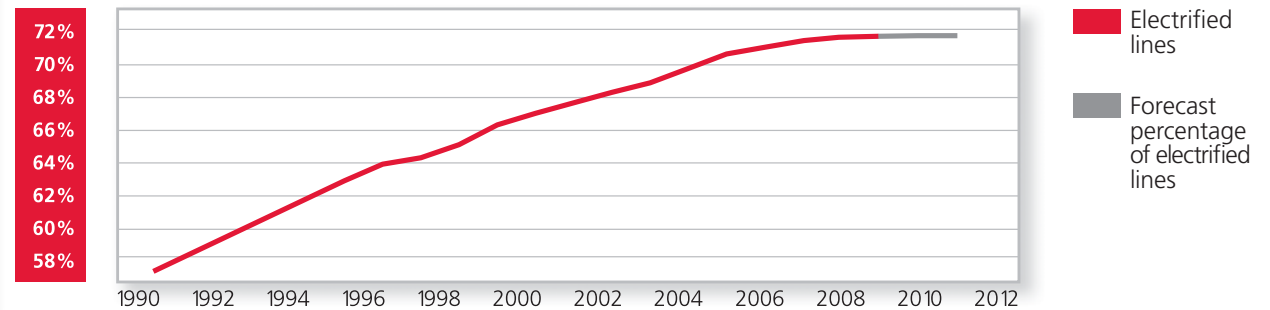
---



## Reduction of CO<sub>2</sub> emissions

The FS Group is firmly committed to cutting greenhouse gas emissions and rolling out ecologically compatible industrial processes. Together with the biggest rail operators in the International Union of Railways (UIC), it signed the first "Environmental Declaration" in Oslo in 1998, inspired by the Kyoto Protocol which led to a number of innovative projects.

## Percentage of electrified lines in entire Italian rail network





---

## Less diesel

In Europe, the Italian rail network is among those with the most electrified lines, which account for more than 70% of the total network in the country. By switching from diesel to electric trains on more than 1600km of rail tracks over the past 16 years, which has boosted electricification from 59% to more than 70%, we have managed to totally eliminate local PM10 emissions and cut greenhouse gases by a further 25%. Not only are electric trains the cleanest form of travel, there is the added benefit that they can now run on renewable energy sources due to be produced in Italy in the next few years.

Indeed, a plan has already been underway since 2007 to electrify a further 420km of tracks before the completion date of 2011.



---

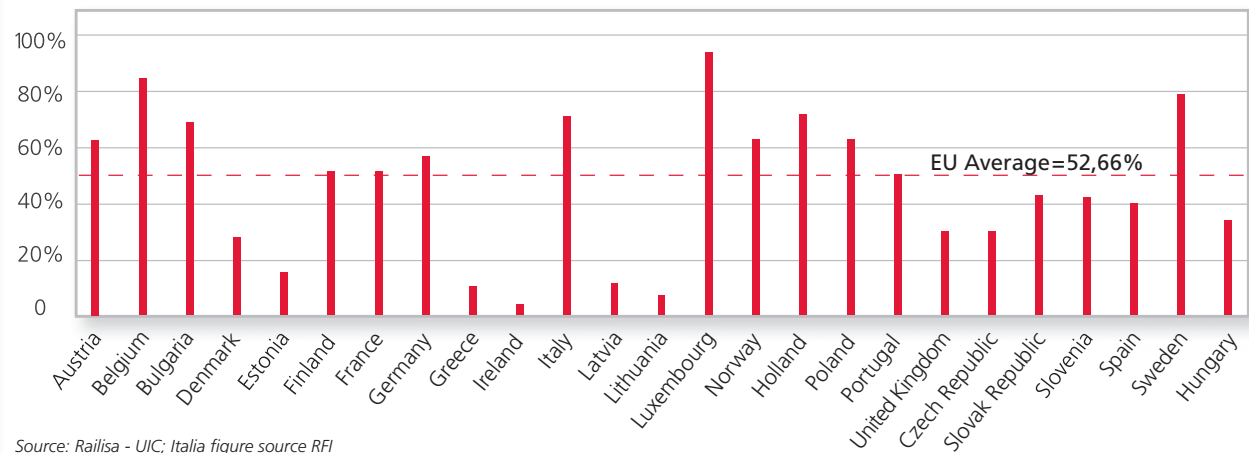
Nature travels by train



## Electrification in Europe and in Italy

Average electrification in European countries is 52.7%. The respective figure of 70.3% for the Italian railways is higher not just than the European average but also higher than other big rail networks, such as France and Germany.

### Rate of electrification in the European Union



Source: Railisa - UIC; Italia figure source RFI



---

## Getting around in the third millennium

The Group has spent a lot of time thinking about the impact of energy consumption and has come up with a very detailed sustainability plan as a result. Of the many initiatives introduced, the biggest, most important one is the Rainenergy project which aims to cut specific rail system energy consumption by 6% before 2020, while it also expects to double the current volumes of traffic carried. This objective will be achieved by designing and developing a system capable of assisting drivers to drive efficiently but not to the detriment of journey times. In fact, this system keeps accelerations and braking between two stations to a minimum, achieving as a result a reduction in energy consumption from tractive force and wear of the braking system.



---

Nature travels by train





---

## Natural gas power generation

The conversion to natural gas in civil (heating) and industrial power stations serving train stations and engine shops continues.

## Curbing noise pollution

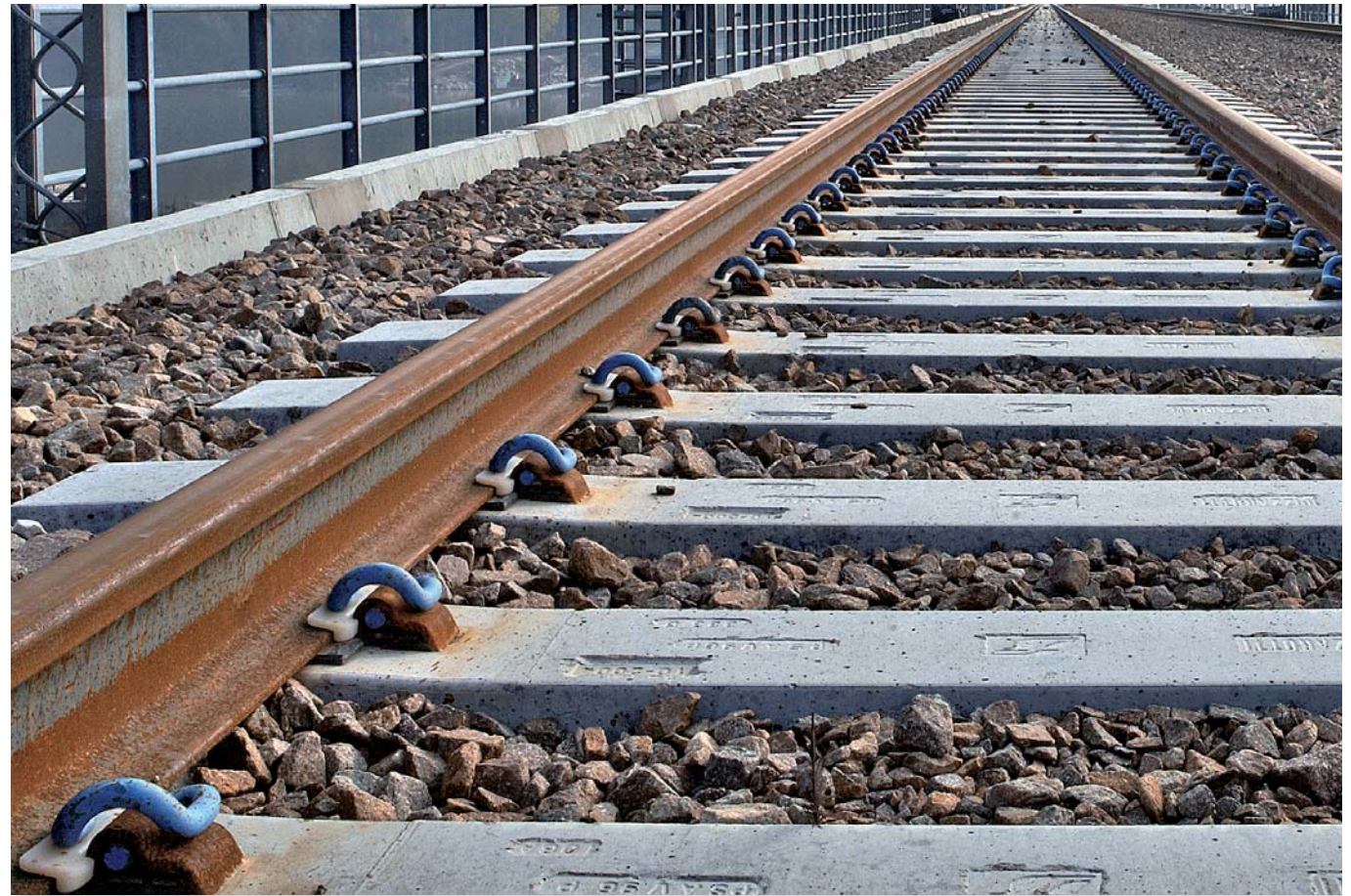
Several measures have been introduced on both tracks (installation of **sound-absorbing barriers**) and trains to cut noise pollution on the rail network. RFI (Rete Ferroviaria Italiana - Italian Rail Network) is one of the first network operators in Europe to have drawn up **acoustic maps of the area**, focusing in particular on locations defined by law as “sensitive entities” (schools, hospitals, clinics, etc.). This has been achieved a whole five years ahead of the deadline set in European guidelines. This mapping gave rise to the **Noise Mitigation Plan**, which outlines the construction of about 3,500km of noise-proof barriers along rail lines and about 3,200 direct actions on isolated or sensitive entities.



---

## Waste management

The FS Group handles in an ecologically compatible manner the waste and residues generated in industrial train maintenance and washing processes carried out in more than 80 plants. The amount of waste generated in 2008 was actually higher than before as in July 2008 steps commenced to scrap more than 5,400 carriages. RFI, the FS Group's infrastructure branch, has developed a patented technology together with CNR to transform creosote-treated railroad ties into inert materials. Once removed from use, these sleepers are replaced by reinforced concrete members. **57% of production waste in 2008** (lead accumulators, spent oils, metals, cross members) was recycled rather than disposed of.



---

Nature travels by train

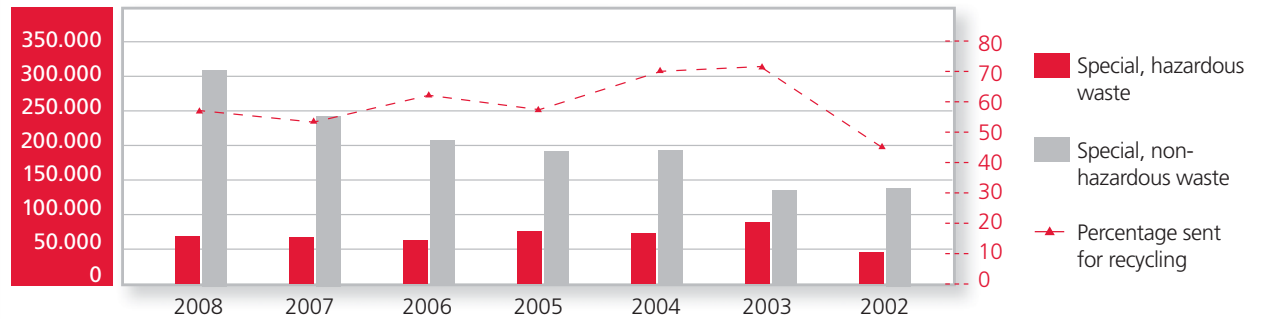


## FS Group waste production

### Total group trend

	2008	2007	2006	2005	2004	2003	2002
special, hazardous waste - tonnes	71.886*	70.155	69.428	74.710	73.753	83.514	45.075
special, non-hazardous waste - tonnes	307.208*	246.410	206.333	195.984	196.336	140.165	144.559
waste sent for recycling - %	57*	54	61	58	72	72	49

\* Estimate based on 5,400 scrapped carriages



Values in tonnes

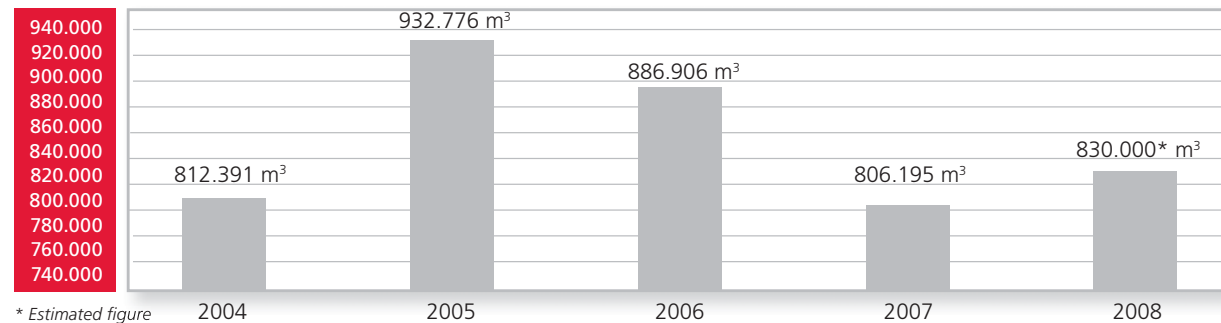


---

## Cutting water consumption

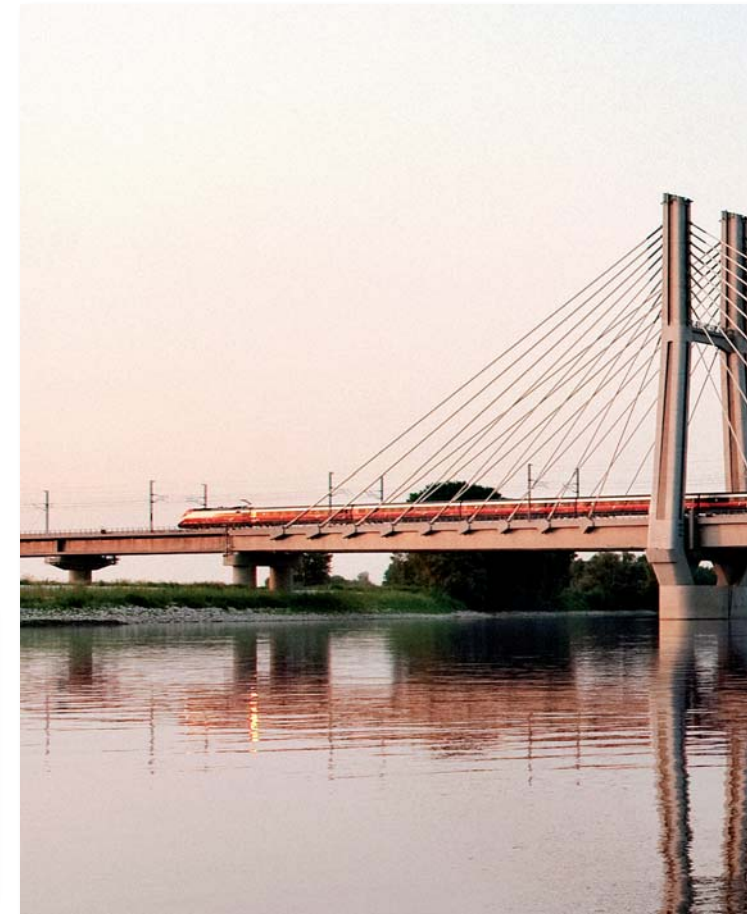
From an examination of data taken from Trenitalia maintenance plants, the ones that make the most intense use of water, it emerged that although the consumption of waste water for industrial use had dropped in recent years, it is now gradually rising again. Concern about saving water was the subject of a very detailed awareness campaign that the Group rolled out to all employees and workers involved in activities in which there is more chance of water being wasted.

## Industrial waste water treated in 43 water-treatment plants



---

## Nature travels by train







---

**Photo:**  
*Ferrovie dello Stato Archive*  
*Roberto Caccuri / Contrasto Agency*

This brochure is printed on FSC paper

