

Contributing to A Sustainable Future

Aad Veenman

Sustainability is one of the big concerns of this world. A fast-growing and more industrialized world population raises serious worries about the future of our planet. Scientific evidence convinces us that something has to be done and rail can and will contribute to the sustainability challenge. NS is the main rail passenger operator in The Netherlands and has already made some major efforts to improve the sustainability of the rail business and will continue doing so.

Brief Profile of NS

NS operates on the main network (about 93% of rail passenger market) in The Netherlands, carrying 15.5 billion passenger-km in 2007. The company also operates international trains to Belgium, Germany and France with its subsidiary NS Hispeed and is starting operation of high-speed trains from Amsterdam to Brussels and Paris soon. The domestic rail passenger market is mainly short and medium distance with train frequencies of at least two per hour and up to ten services in both directions in the core region. In addition to the rail passenger business, NS operates nearly 400 stations and owns important areas of real estate in station areas. It is a rail operator that is fully separated from the infrastructure manager. In 2007, profits reached €337 million. More comprehensive information about NS is available on our website (<http://www.ns.nl>). NS uses about 1400 MWh of electricity per year, or about 1.4% of total electricity in the Netherlands. About 85% is for traction; diesel traction plays a very small role in the NS business (about 2% of passengers are carried by diesel trains).

Why Focus on Sustainability?

A focus on sustainability is not so obvious in a world where profit maximization is a key factor in economic progress. However, a strategy focusing on sustainability should not be confused with charity or lack of focus on profitability. Sustainability is an integral part of the NS business approach for three reasons.

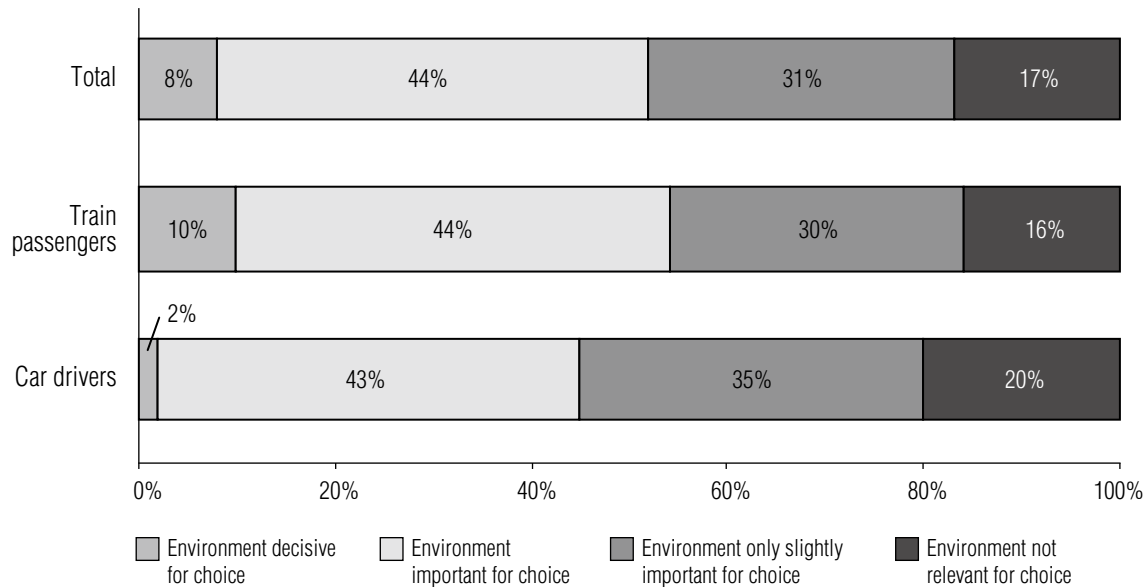
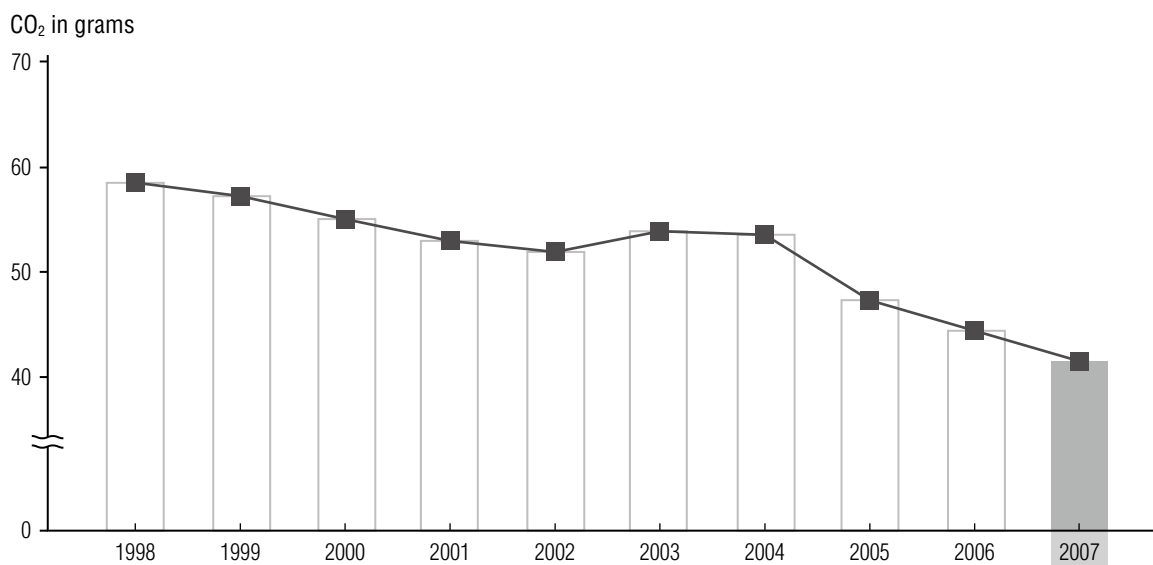
First, the responsibility to contribute to a sustainable world is part of NS's identity where staff and management have a strong positive attitude about contributing to social

objectives. This is reflected in our policy towards people with reduced mobility and in the way NS contributes to regional mobility policy going beyond profitability. As such, contributing to sustainability is incorporated in the company identity. Environment is also a factor that makes sense for NS as an attractive company to work for—an important factor in a scarce labour market. Obviously, NS management takes its responsibility to integrate sustainability into the company seriously.

Second, customer perspective is an important driver in strengthening our efforts towards sustainability. In 2007, we interviewed more than 1400 people, both rail customers (using the train most for distances over 5 km) and regular car users (using the car most for distances over 5 km). Remarkably, we discovered that 52% of our (potential) customers treat the environment as an important feature in their choice of transport mode (Figure 1). Although NS realizes that other basic quality factors, such as travel time, punctuality, comfort and information are very important, the environment cannot be denied as an important feature when travelling by rail. Even if rail in The Netherlands is already the most sustainable transport mode, it is important to keep sustainability high in our (potential) customers' minds by communicating the advantage and progress of NS sustainability.

Third, the competition perspective is of real importance. In the domestic market, NS competes mainly with cars. Although the car industry claims it is making major progress in sustainability, this is not the reality in Holland where larger and more comfortable cars have completely offset any sustainability progress so far. Nevertheless, the car industry is continuing work on more sustainable cars. Assuming that car drivers (potential customers) view the environment as important, there is an obvious need for further improvement in rail passenger sustainability. From a social perspective, the environmental advantage of rail is important. It is one reason to invest in more rail infrastructure capacity using public funds. Infrastructure capacity is needed to facilitate the growing demand for mobility by rail. Recent hikes in fuel prices reflecting growing scarcity will help us find better cost-benefit cases to invest in increased rail capacity and in measures to further increase rail sustainability.

Although the competition perspective asks for improved

Figure 1 Importance of Environmental Aspects in Choice of Transport Mode**Figure 2 CO₂ Emissions per Passenger-km**

Saving Energy Consumption

sustainability, clearly the environmental advantage of rail is a key value of NS. In passenger services, rail is almost three times more environment friendly than the car. In 2007, the average CO₂ emission per train passenger-km was 41 g (Figure 2), compared to 120 g per car passenger-km (CBS Centraal Bureau voor de Statistiek, Netherlands Statistics). In the long-distance market, high-speed rail is three times better than flying. For these reasons sustainability is part of the NS marketing and communication strategy as explained later.

In 1997, NS committed itself to reduce traction energy consumption by increasing energy efficiency—measured as energy used per seat-km—by 10% between 1997 and 2010. This commitment has been developed as part of a long-term agreement between NS and the Ministry of Economic Affairs, which is responsible for energy policy. In addition to the commitment on energy efficiency, part of the agreement was a commitment to have a 5% share of renewable electricity used for traction by 2010.

Between 1997 and 2005, NS has improved energy efficiency by 15.6%, going far beyond the original targets in the long-term agreement. In 2006, NS revised the targets for energy efficiency between 1997 and 2010 to 20%, achieving 19% by the end of 2007 (Figure 3). The most important measure responsible for this achievement was the introduction of new double-decker rolling stock with much better energy use per seat-km. Introduction of regenerative braking and modifications to temperature and ventilation systems are examples of other measures contributing substantially to these energy savings. Here, we must mention that all these measures were decided based on normal business criteria. Energy savings simply lead to reduced costs of energy and beyond that also create lower greenhouse-gas emissions.

Reduction of Greenhouse-gas Emissions

In addition to the NS commitments on energy efficiency, in 2007, the company made a very strong commitment to a 20% reduction in CO₂ emissions between 1990 and 2020. NS was the first Dutch company to respond voluntarily to the EU political agreement on this commitment, which is a 20% reduction in *absolute* terms, meaning a 20% reduction *whatever* the business figures until 2020. This commitment must be considered in the light of the three main drivers explained above, considering sustainability to be an important key in the future of NS.

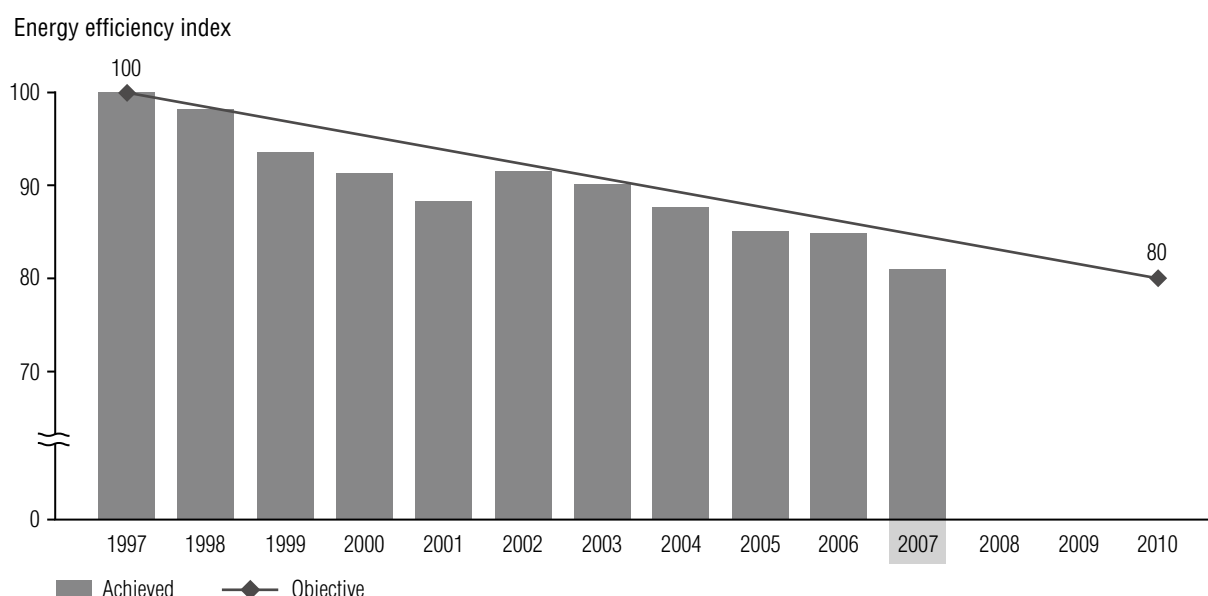
The reduction in CO₂ emissions has been achieved in three ways:

- Production of electricity has become much more CO₂ efficient. Between 1990 and 2005, CO₂ emissions of Dutch electric utilities dropped by 22% from 667 g/kWh to 521 g/kWh, obviously helping NS make its strong commitment on CO₂.
- NS's better energy efficiency from 1997 to 2005 further contributed heavily to reduced CO₂ emissions.
- Moreover, between 2005 and 2008, the share of renewable energy in the total mix increased from 2.5% to 10%.

All these developments helped strongly reduce CO₂ emissions in absolute terms from 1990 to 2007 but NS has certainly not yet met its 2020 commitment. The challenge is at least to absorb all increases in CO₂ emissions up to 2020 resulting from growth of the business. As an indication, increasing the business by up to 50% (not unrealistic) between now and 2020 means that CO₂ emissions per passenger-km must be improved by about 33% in the same period. Clearly, this is a very ambitious goal that can only be achieved using all possibilities.

The best contribution NS can deliver to global sustainability is to shift people from the car and plane to rail (or from 120 to 41 g of CO₂ per passenger-km). Although a reduction in rail passenger business could help NS meet its commitments, obviously this measure is excluded as a rational option. The ambition is still a 20% reduction in CO₂ emissions by 2020 while simultaneously increasing the rail passenger business as much as possible.

Figure 3 NS Energy Efficiency Trend





New Sprinter

Current and Future Efforts Towards Fewer Greenhouse-gas Emissions

Obviously CO₂ efficiency per passenger-km has to be improved. One important tool in achieving this is efficient driving. For example, 30% of NS trains arrive more than 30 s early, meaning they have wasted energy, so this is a very important topic. Energy-efficient driving has become part of each driver's initial and ongoing training. International cooperation in this field is being performed in Trainer, the European train driver programme. Together with the Dutch infrastructure manager ProRail, tools are being developed to provide relevant information to train drivers to make better decisions about using power equipment. Automatic comparison between the planned timetable and rail running time could help maximize the traction efficiency without causing delays.

Since heating trains uses about 11% of the total energy, its optimization can lead to important savings. Lowering temperatures, decreasing ventilation—while avoiding unpleasant effects on passengers' comfort—and recalibrating thermostats all gave good results on older rolling stock. On the new NS Sprinter EMUs, the doors close automatically 10 seconds after the last passenger has passed, preventing loss

of warmth, especially during longer intermediate stops and at the terminus. Although hard to believe, it has been proved that air conditioning helps reduce energy consumption of trains. The fixed windows prevent loss of warmth and the consequently better surface streamlining reduces the energy needed for accelerating and maintaining speed, explaining why air conditioning is or will be provided on new and refurbished NS trains.

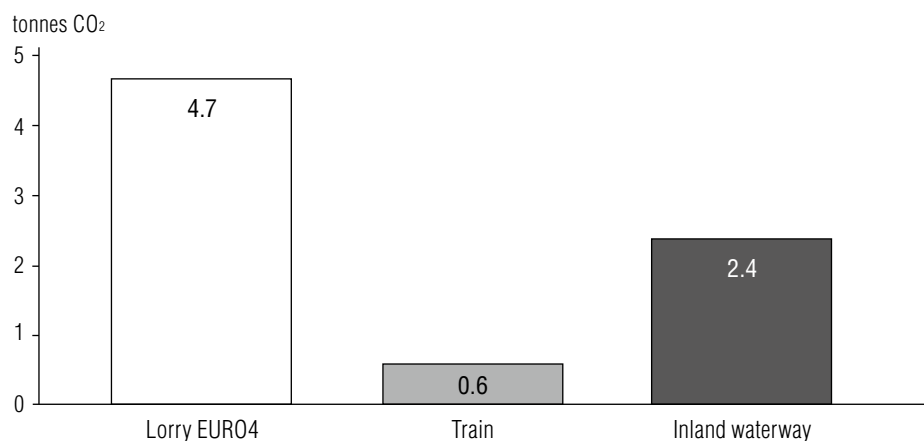
Together with ProRail we are developing technical solutions to reduce energy supply losses. Storing regenerated braking energy is a key topic in this field. So is reducing points heating in winter, especially when no trains are running. Energy saving has become an important issue in our dialogue with the rail industry.

The new Sprinter EMUs built by Bombardier/Siemens are over 30% more energy efficient than the trains they are replacing. Recent press releases from the rolling stock industry clearly show an even larger potential to save energy.

A very important operational measure is improved load factor. Due to the 40% peak hour share, the average load factor of the 30,000 NS trains running each week in Holland is less than 30%. Further reduction of train length during evenings and weekends would not only improve energy

Figure 4 Comparison of Freight Emissions

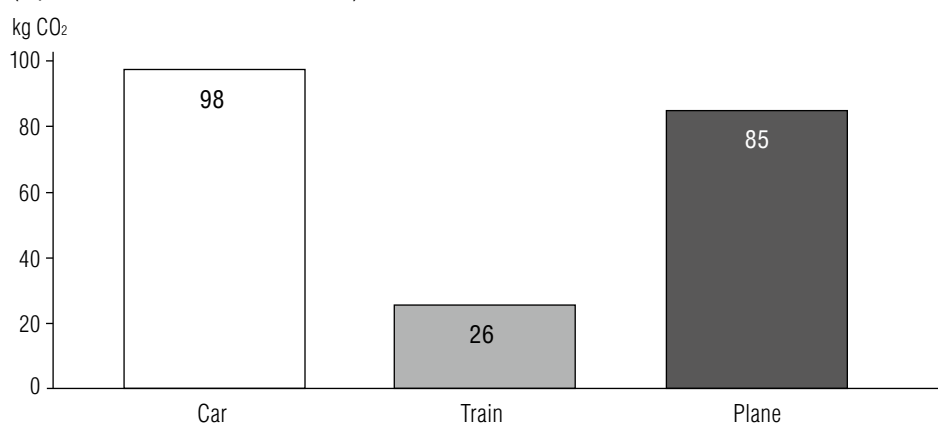
(100 tonnes cargo, Basel - Rotterdam, 700 km)



Source: www.ecotransit.org 2008

Figure 5 Long-distance Freight Emissions

(1 person Berlin - Frankfurt, 545 km)



Note: Plane emissions include travel to and from the airport; they are not increased to take account of the effect of emissions at high altitude.

Source: www.ecopassenger.org 2008

efficiency and CO₂ emissions, but also NS's financial results and customers' feelings about security because nobody benefits from only 100 passengers travelling on a 600-seat train late in the evening.

Another measure to contribute to reduced CO₂ emissions is increasing the share of renewable energy, which currently stands at 10%, making NS one of the five largest private consumers of renewable electricity in The Netherlands.

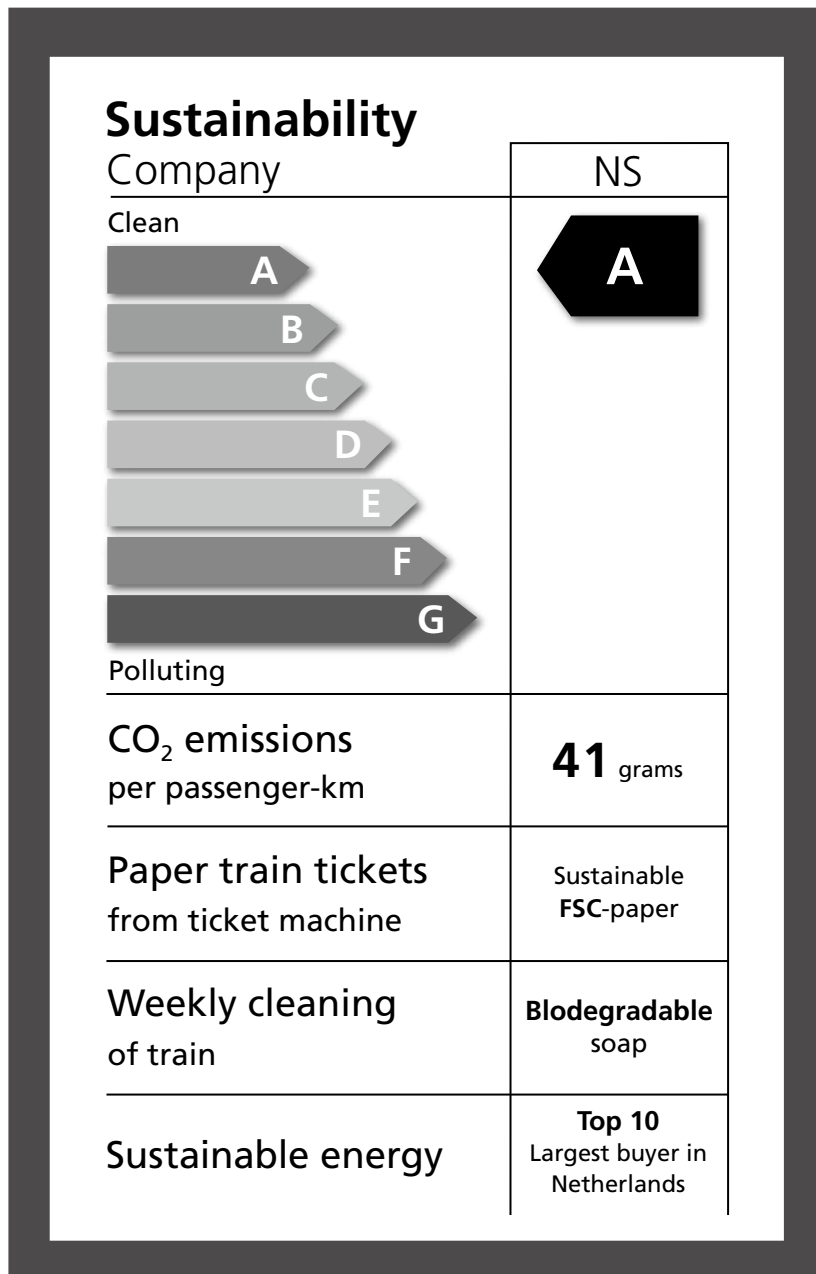
More on Sustainability

Obviously, use of energy and emission of greenhouse-gases is not restricted to driving trains. About 20% of NS's energy use is for facilities like stations, offices and workshops. Here,

savings will be achieved by introducing solar panels like those on the roof of the new Utrecht Central Station.

While sustainability is focusing a lot of attention on several other major topics, such as noise and barrier-free access, small issues are important too, such as using sustainable FSC-paper for train tickets, using biodegradable soap for cleaning trains, separating paper from other litter in trains and stations, green purchasing, and more.

The social perspective is quite important for NS, which delivers most train services in Holland and contributes heavily to the accessibility of urban areas and regions. In several urban corridors during peak hours, NS trains serve more than 50% of the market. The social value of urban rail transport is large because it provides accessibility, saves space, and



NS Sustainability Label

helps reduce local air pollution. NS is developing stations into places that actively contribute to the social structure of cities forming the heart of a green lifestyle. In close cooperation with regional authorities we are focusing on improving regional services, and security and service levels on stations.

The people perspective contains a strong policy on diversity, focusing both on women and immigrants. Further, NS is contributing actively to an anti-vandalism campaign. A large part of our sponsorship activities is promoting healthy lifestyles by eating healthy food (in stations) and being active in sports (sponsored Dutch Olympic team).

European Perspective

Climate change has become an important policy objective of the EU, which now acknowledges that supporting a greener transport strategy is crucial. The increasing focus on transport is partly due to growing awareness of the problems it causes in trying to meet the EU's climate change targets; transport accounts for 27% of total greenhouse-gas emissions in Europe, and while overall emissions fell by almost 8% between 1990 and 2007, those of transport increased by 25%. Consequently, the Commission's Legislative and Work Programme 2008 states that, 'Tackling climate change will be an integral part of the Commission's priorities in 2008 to secure sustainable prosperity for Europe ... Particular



NS Green Campaign 'Nature has something to say. Take the train now and then. This way, you can be green.'

attention will be given to measures to encourage the greening of the transport sector.'

In January 2007, the EU published an agreement to reduce greenhouse-gas emissions in the period 1990–2020 by 20%, achieving a 20% share of renewable energy and consuming 20% less energy. The Climate Change Package released on 23 January 2008 by the Commission outlines how the Commission intends to implement the 20% cut in 1990 levels of greenhouse-gas emissions by 2020, including use of binding national reduction targets for those sectors (including transport) that fall outside the Emissions Trading System. This envisages a 10% average cut varying from

–20% to +20% per country, depending on per capita GDP. However, this is regarding the 2005–20 period, because after establishing the initial objectives for 1990–2020, the Commission realized that the figures for the period 1990–2005 are not simple to define. For this reason, it assumed that a 10% reduction in CO₂ levels had already been achieved for 1990–2005 and so started to agree targets for 2005–20. The Commission has also clarified that the targets are likely to be tightened in 2009 when the successor treaty to the Kyoto Protocol is signed in Copenhagen, because the EU has already agreed to raise its target for 2020 to a 30% cut in levels of greenhouse-gas emissions in the event of reaching

a global agreement.

The European rail sector supports the EU commission in these targets and we regret that there are no clear targets on the transport sector. Despite good European policy intentions to reduce auto emissions, progress on bringing airlines under the European Trading Scheme and introducing the polluter pays principle has been disappointing so far. Even a proposal to abandon the prohibition to charge for environmental costs in the road sector (which has the largest share of greenhouse-gas emissions in the transport sector by far) is politically difficult and can only be achieved with major compromises. Most of the consequences are generally perceived as threats, and the benefits for the environment, economy, and quality of life are ignored. There is a perception that mobility is some kind of 'public good' that comes for free or at a very low price. But society cannot afford to think like this any more. Nevertheless, I believe there are good reasons for hope because of the growing awareness of transport users about climate change.

A modal shift from road and air to rail is delivering the highest reduction of greenhouse-gas emissions because rail is four to eight times better in terms of emissions than the competitors (Figures 4 and 5). Creating a fair and level playing field between all transport modes is a precondition for achieving a stronger role for rail in Europe both in freight and passenger transport. For our part, NS is keen to contribute to the modal shift by improving services, investing in new rolling stock and information technology, etc. As an example, the members of the Community of European Railways (CER) have committed to a voluntary target of an average sector-wide cut of 30% in specific emissions over the 1990–2020 period. As CER chairman, I'm proud of this. While respecting the need for healthy profits, the railway sector is clearly showing its sustainable nature by this commitment.

Communication

Finally, I would like to emphasize the need for proper communication about rail's environmental features. NS is communicating in three domains: on awareness about the environmental performance of NS; on the perception of NS as a sustainable company; and on marketing of sustainable propositions.

To achieve better awareness about our environmental performance, we developed a corporate campaign based on the sustainability labelling consumers know for other products like washing machines and cars. The advertising focuses on greenhouse-gas emissions, but nevertheless incorporates a broader view by mentioning sustainable paper for tickets and biodegradable soap for cleaning trains. In the perception domain, we work mainly by sponsoring events and other products, such as the 'live earth' event in The Netherlands,

and the Dutch version of the film *Earth*. The 2008 marketing campaign was devoted completely to the green nature of our services. Our 'Nature has something to say' slogan was elaborated in both commercial and corporate advertisements. In the business-to-business market, NS together with car leasing companies is developing combined services for business travellers. This combined service allows them to use their lease car and train passenger services in a very flexible and easy way, depending on their day-to-day needs. In this way business travellers can contribute to sustainability while respecting the business need for flexible and high-quality mobility.

Conclusions

I hope this brief article will contribute to improved awareness about sustainable possibilities in the business of railways. On the other hand, I call on politicians and decision makers to support and invest in rail as the sustainable transport mode for planet earth! ■



Aad Veenman

Dr Aad Veenman has served as President of Netherlands Railways since 2002. He is also Chairman of the Community of European Railways and Infrastructure Companies (CER). He is a member of the supervisory board of Rabobank, TenneT and GVB Amsterdam (Public Transport Company Amsterdam). Prior to his current position, he was President and CEO of Stork NV.