

Position Paper

Climate Protection in the Transport Industry

**Build on Success, Pursue Sustainable
Strategies**

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The German Transport Forum

Our mission

Mobility for Germany and for Europe – through a functional, customer-driven, environment-friendly and integrated transport system.

What we do

We represent the common interests of the transport industry in Germany in the political domain, the media and society.

We support measures to further mobility and improve underlying conditions as essential prerequisites for growth and employment.

We create a “shop window“ to promote exports of the transport industry’s products and services and thereby help entrench its leading global position.

Our aims

- Recognition of the crucial importance of mobility and the transport industry.
- Efficient and developable transport infrastructure.
- Intelligent transport networks allowing full utilisation of synergy potential and of the specific strengths of the individual modes of transport.
- Fair competitive conditions for all transport modes – on the national and international level.
- Customer-oriented, integrated mobility solutions.

Our activities

We provide the platform for debate on core transport issues between customers, transport providers, business, science and government.

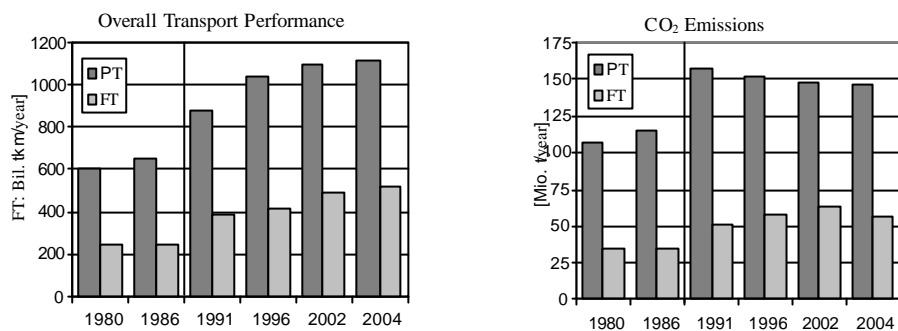
We further opinion-shaping on current transport issues through critical and constructive comment, round-table sessions, media and public affairs.

We cooperate with political decision-makers and other associations of the road, rail and air transport, maritime and inland shipping industries – national and international.

Climate Protection in the Transport Industry – Summary

Global climate protection is of pivotal importance in the efforts to conserve our natural environment. The German transport industry is making a lasting contribution towards climate protection by reducing its consumption of energy and fossil fuels as well as by lowering emission levels.

The progress achieved is made clear by comparing traffic developments over past 15 years with the development of energy consumption and emissions in the same period: While the volume of traffic has risen significantly, energy consumption and emissions in the transport sector have remained constant and have, in many cases, been reduced.



Overall transport performance and CO₂ emissions of all transport modes in Germany

Figures up to 1986 for old Federal States; figures from 1991 on including new Federal States

PT = passenger transport; FT = freight transport; Source: DLR/ifeu 2006

Transport performance and emissions have been decoupled largely through deployment of improved technologies, targeted investment in the transport infrastructure and optimised processes as well as own initiatives and commitments undertaken by transport companies and automotive manufacturers.

Future climate protection measures in the transport industry must build on the advances already achieved and take them further forward. Competitive conditions must be taken into account. If the regulatory framework properly shaped, the transport industry will be able to achieve the optimum results in respect of climate protection.

Build on proven strategies

Four Guidelines

The German Transport Forum recommends the following step towards an effective climate protection policy in the transport sector:

1. Elimination of bottlenecks in the transport infrastructure.
2. Active promotion of new technologies and investment that benefit the climate.
3. Improvement of interfaces and user behaviour patterns.
4. Competitive concepts instead of isolated legal solutions.

1. Elimination of infrastructure bottlenecks

An overburdened infrastructure at highly congested traffic hubs like Germany leads to inefficient transport processes, additional consumption of resources and adverse effects on the climate. This negative impact on the environment can be avoided with an infrastructure tailored to requirements. Important measures are:

- The introduction of modern traffic management and traffic information systems, and systematic efforts to eliminate bottlenecks in the road network.
- Support for and implementation of the German rail “Network 21“ project.
- Systematic expansion of capacities at seaports and their inland connections.
- Implementation of the Single European Sky (air traffic control) and the German airport infrastructure masterplan.

2. Promotion of climate-friendly technologies and investment

Progress in climate protection is based principally on new technological developments. Investment needs to be furthered so as to ensure deployment of the best technologies. Levies or taxes, that deprive the transport industry of the necessary funds, are counter-productive for the environment. Important measures are:

- Expansion of EU and German research programmes on transport and the environment.
- Development of alternative engines and fuels. Incentives to encourage their deployment.
- Development of automotive technical prerequisites to increase the admixture of bio-fuels in cars to 10 per cent.
- Implementation of an alternative fuel strategy on German and European level.
- Introduction of car duties based on CO₂ emissions levels.

3. Improvement of interfaces and user behaviour patterns

The efficiency of a transport system depends on the interplay between transport providers of different modes of transport. The public authorities must continue cooperating with the transport industry in developing efficient interfaces and an intelligent traffic information management system. Because an optimally utilised transport system minimises negative effects on the environment. Important measures are:

- Systematic expansion of intermodal logistics terminals in Europe; go ahead with freight transport and logistics masterplans.
- Harmonise standards and licensing; eliminate administrative and technical obstacles.
- Support process improvements by system partners in the “Air Traffic for Germany“ initiative and promote similar targets on the European level.
- Furnish consumers with information on fuel-saving driving practice in road traffic.

4. Competitive concepts instead of isolated regulations

Transport services are offered in an open market in international competition. Laws and regulations on climate policy targets must therefore be internationally coordinated and harmonised. National or European go-it-alone solutions jeopardise competition and jobs in the transport industry – they do not bring about lasting improvement in the global climate, either.

Emissions trading in the transport industry?

Emissions trading controversial

Despite the successes, which transport providers have achieved on climate protection, new regulatory measures are currently under discussion in the EU. The EU Commission is proposing the inclusion of aviation in an EU emissions trading system (ETS). Emissions trading as an instrument of climate protection is, however, already a controversial subject in its present form.

From the viewpoint of the German Transport Forum, the following points should be considered when evaluating the envisaged application of emissions trading in the transport industry:

No unilateral handicaps for airlines

- The introduction of emissions trading in **air transport** only for European airlines would create a serious unilateral burden for European carriers and cannot be approved. Prior to the introduction of emissions trading in international air transport, a thorough study of the effects and possible solutions of all outstanding issues is essential.

No further regulation of road traffic

- The inclusion of **road traffic** in emissions trading is precluded with regard to the current imposition of manifold taxes and fiscal instruments on road transport which are linked to environmental purposes.

No indirect burdening of rail transport

- The same applies to **rail traffic**. Because of its utilisation of electricity as an energy source, rail traffic is already indirectly affected by emissions trading. Rail traffic ought to be freed from those effects by appropriate cuts in the energy tax made possible by the EU energy tax directive.

Continue international agreements for maritime sector

- Agreement on climate protection regulations in **maritime transport** should continue to be pursued in accordance with proven practice within the framework of IMO, CCR and EU.

Contributions to Climate Protection by Transport Providers.

Perspectives for Future Reduction Measures

All transport providers in Germany are successfully pursuing active strategies on resource conservation and climate protection. Those strategies not only measure up to legal requirements, they are also backed by substantial efforts on the industry's own initiatives.

Road Traffic

Manufacturers on track with fuel consumption and CO₂ reduction

The automotive industry has reached agreements at German and European level aimed at reducing the fuel consumption of cars and their CO₂ emissions levels. The manufacturers are investing a substantial outlay on technology in order to adhere to the agreed targets.

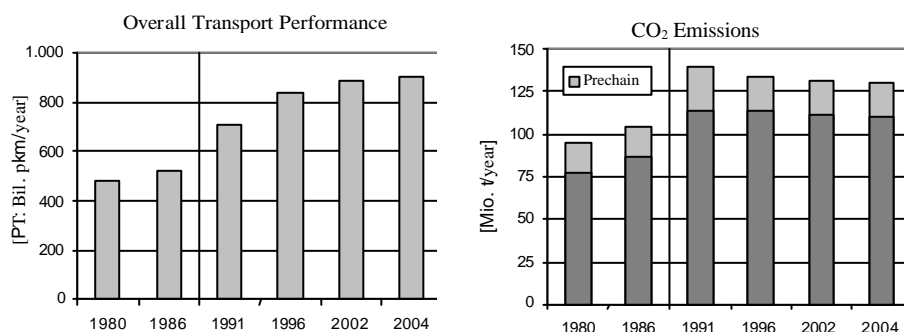
Between 1990 and 2005, for example, the agreed reduction of 25 per cent in the fuel consumption of cars and station wagons was fully met in Germany. The automotive industry is on track to reduce average CO₂ emissions across the EU to 140g CO₂/km by 2008.

It should also be emphasised that the mineral oil industry supplies only sulphur-free fuels for road traffic in Germany.

Declining CO₂-emissions despite strong traffic growth

The Traffic Research Institute of the German Aerospace Agency (DLR) has in cooperation with the Institute for Energy and Environmental Research (ifeu) completed a new study* for the German Transport Forum on the development of energy consumption and emissions. For **motorised individual traffic**, the findings show that while traffic grew by 27 per cent, in the period between 1991 and 2004, fuel consumption remained at a constant level and CO₂ emissions declined by seven per cent. Scheduled bus services grew by 20 per cent, while energy consumption fell by 20 per cent and CO₂ emissions by 29 per cent.

In **freight transport**, CO₂ emissions in terms of tonne-kilometres have been reduced by around 20 per cent since the early Nineties.



Motorised individual traffic: Transport performance and CO₂ emissions in Germany

Figures up to 1986 old Federal States – Figures from 1991 including new Federal States; Source: DLR/ifeu 2006; Prechain = Emissions in production and supply of energy

Success with diesel engines

A significant contribution towards those gains has come from fuel-efficient diesel engines. Just a ten-per cent increase in the diesel share of fuel consumption results in CO₂ emissions being reduced by between two and three per cent.

However, high road and fuel taxes are depriving motorists of funds to renew the fleet with modern fuel-efficient cars. The average age of a car in Germany is meantime about nine years.

Fuel-saving training

Alongside the voluntary accords reached by the manufacturers, other measures are being taken to improve user information. The EU CO₂-labelling system will enable motorists to take emissions more into account as a criterion when buying a car. Even more decisive, however, is how a car is driven: Fuel-efficient and economical driving can save up to 25 per cent on fuel. That is why manufacturers and automobile clubs are offering fuel-saving driving courses. The mineral oil industry is also advocating economical driving practice and furnishing motorists with information on ways of optimising fuel consumption.

CO₂-based car tax

Further options for reducing fuel consumption lie in greater use of alternative fuels, purposeful expansion of road infrastructure to avoid congestion and the inclusion of linear and non-discriminatory CO₂-components in car taxes. The German ADAC automobile club also supports taxing cars in accordance with their emission levels. The German automotive industry is already taking technical measures to increase the admixture of bio-fuels to conventional fuel by ten per cent. Concerted contributions from car manufacturers, drivers, fuels and the infrastructure could help towards sustaining and furthering the advances hitherto achieved on climate protection in road traffic in the future.

Admixture of bio-fuel

Rail Transport

Sustained emissions reduction

Specific emissions – i.e. emissions related to transport performance – have been further reduced from a low level in rail traffic. In an ambitious energy saving programme, Deutsche Bahn AG set itself the target of reducing specific CO₂ emissions on the 1990 level by 25 per cent by 2005. It achieved that objective in 2002. German Rail is also on course in its “Climate Protection Programme 2020” to realise further cuts of at least 15 per cent. It has already reduced specific CO₂ emissions on the 2002 level by 5.5 per cent.

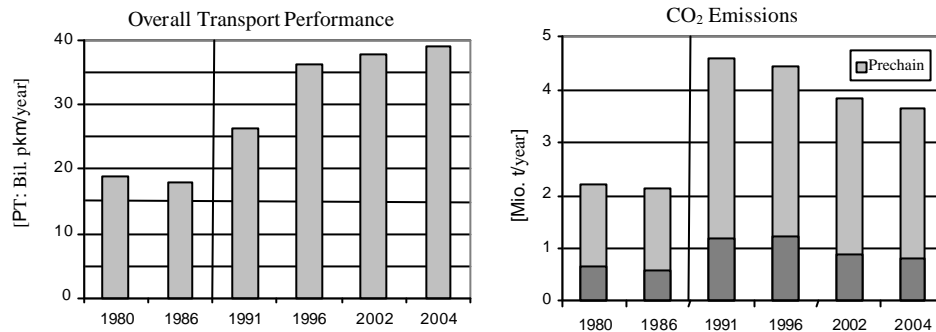
Additional reduction of 15% by 2020

ICE 3 highly energy-efficient

Modern, highly efficient trains like the ICE 3 contribute especially to more efficient use of energy and higher utilisation. Additionally, 14,000 train drivers have been trained to drive more economically. On the Hamburg-Munich route, a driver can in that way save up to 4,000 kilowatt-hours of electricity. That is equivalent to the annual consumption of a four-person household.

Climate policy success in local and long-distance rail traffic

Findings in the current DLR/ifeu study* show that energy consumption in **local rail transport** in 2004 had risen by only three per cent and that emissions were down by 21 per cent against the 1991 level despite an increase in transport performance of 49 per cent in the period. Transport performance in **long-distance rail transport** rose six per cent, while energy consumption fell by 14 per cent and CO₂ emissions by 29 per cent.



Local and urban rail transport: Transport performance and CO₂ emissions in Germany

Figures up to 1986 old Federal States; Figures from 1991 on including new Federal States; Source: DLR/ifeu 2006

German Rail highly taxed in EU comparison

In the eco-tax reform, rail traffic is affected by both mineral oil and electricity taxes. In 2005, Deutsche Bahn's expenses on energy taxes and duties totalled 380 million euros. Rail traffic in Germany is more heavily taxed than that in any other European country. In return for an easing of energy taxes and duties, Deutsche Bahn is willing to voluntarily set itself a target of reducing specific CO₂ emissions by up to 25 per cent by 2020.

Rail traffic does not itself participate in emissions trading. It is, however, significantly affected as an energy consumer by rising electricity prices, which are partly caused by emissions trading.

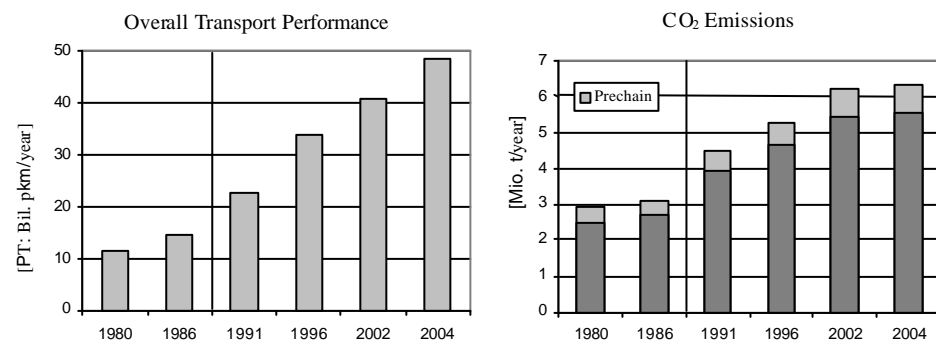
Air Transport

Highest engine efficiency. Investment in modern aircraft

Success in climate protection in air traffic also rests on several pillars. The aviation industry has lastingly reduced fuel burn with improved aero-engines, consistent fleet renewal and optimised flight procedures. The Lufthansa fleet, for example, reduced **specific fuel consumption** – the amount of fuel required to fly one passenger 100 kilometres – by 29 per cent between 1991 and 2005. That is equivalent to a 29 per-cent reduction in carbon emissions. In a word, traffic growth has largely been decoupled from emission levels.

Growth and emissions decoupled

That decoupling is also evidenced in the findings of the DLR/ifeu Study? The transport performance of air traffic in Germany climbed significantly by 114 per cent between 1991 and 2004 (passenger-kilometres of all flights that took off or landed in Germany). Energy consumption in the same period rose by only 43 per cent, absolute CO₂ emissions by 41 per cent.



Air transport: Transport performance and CO₂ emissions in Germany

Figures up to 1986 old Federal States; figures from 1991 on including new Federal States; Source: DLR/ifeu 2006

Aviation industry invests 14% of revenues in R&D

Following publication of the second strategic research agenda of the Advisory Council for Aeronautical Research in Europe (ACARE) in 2004, the air transport industry re-affirmed its objective of reducing fuel consumption and specific CO₂ emissions by 50 per cent and NO_x emissions by 80 per cent by 2020. Aircraft manufacturers are currently investing 14 per cent of revenues in research and development and a significant portion of that is helping to improve the environmental balance of air traffic.

Fewer holding patterns with Single European Sky

The Single European Sky proposed by the EU to harmonise air traffic control in Europe offers a basis for shortening flight routes and reducing holding patterns at airports. Moreover, the International Civil Aviation Organisation (ICAO) has compiled a catalogue of directives for systematically lowering fuel consumption and emissions in international air traffic. The ICAO is also negotiating on the issue of including international air traffic in emissions trading.

Ship Transport

Reduction of specific consumption

In the maritime industry, the trend towards larger and safer ships as well as improved fuel-efficient engines has led to a perceptibly better environmental balance in the shipping industry. While the transport volume in international shipping has risen by 44 per cent since 1990, the number of ships has increased by only 16 per cent. Simultaneously, **specific fuel consumption** has fallen by six per cent.

Like ICAO in air traffic, the International Maritime Organisation (IMO) is conducting negotiations on the implementation of the Kyoto objectives in the shipping industry. Mandatory agreements on fuel quality are already in place: In May 2006, IMO regulations prescribe a worldwide maximum of 4.5 per cent in the sulphur content of fuel oil. The sulphur content of fuel oil used on-board ships in the Baltic Sea as a special "Emissions Control Area" must not exceed 1.5 per cent.

Tighter emissions caps in inland shipping

The Rhine shipping central commission (CCR) defined stringent emissions limits for commercial inland shipping in the whole of Germany in 2003. Those limits will be tightened in a second phase across the EU in July 2007. The EU Commission will additionally put forward proposals to lower emissions levels even further from 2012.

Development of low-pollutant engine

Further potential to save on fuel and reduce emissions can in future be achieved by improvements in hull design and engines as well as in cleaning systems for exhaust gases from ships. These technological steps ought to be systematically accompanied by regulatory measures, such as incentives for installing new, low-emission engines and directives from the EU specifying quality standards for fuel used in inland shipping.

Quality standards for fuel

Recommendations for effective climate protection in the transport sector

Successful climate protection in the transport industry thus entails a whole package of measures that include all the stakeholders – companies, consumers, government and local authorities. It is also important that the transport industry and users be encouraged by constructive incentives to conserve resources and protect the climate, and that the existing scope for action not be fenced in by additional regulatory requirements.

The German transport industry in the heart of Europe must accommodate rising demand and face up to severe competitive pressures. Employment and economic growth in Germany also depend considerably on positive developments in the transport sector.

Climate protection measures should, therefore, be so defined as to allow performance to increase in accordance with requirements and not impinge on the competitiveness of the transport providers. All progress must also in future be achieved, while adhering to the highest technological standards and security requirements, and against increasingly fierce international competition.

Building on past achievements, the German Transport Forum has drafted the following **guidelines for an integrated, cooperative and equitable climate protection regime in the transport industry:**

1. Elimination of bottlenecks in the transport infrastructure.
2. Active furtherance of climate-friendly technologies and investment.
3. Improvement of interfaces and user behaviour patterns.
4. Competitive concepts and cooperation instead of isolated national legislation.

1. Elimination of bottlenecks in the transport infrastructure

Bottlenecks and deficiencies in the infrastructure cause congestion and make transport processes inefficient. That way, infrastructure weakpoints lastingly worsen the environmental balance of the transport industry. Resources are being consumed and emissions are being generated without benefits in transport performance.

*Implement SES-
SESAR. Provide
for adequate
airport
infrastructure*

That is amply demonstrated by the 6 to 12 per cent savings that can be achieved on fuel in air transport alone through the improved airspace structures and airspace utilisation ensuing on implementation of the "Single European Sky" project. Similar benefits result from elimination of bottlenecks on the ground, since tailoring airport capacities to demand avoids wasteful holding patterns by queueing aircraft waiting to land. Therefore, expeditious implementation of infrastructure improvements in the air (SESAR project) and on the ground (Airport Masterplan) is also highly important for the environmental balance of aviation.

*Remove road
network
bottlenecks.
Further traffic
telematics*

In German road traffic, about twelve billion litres of fuel annually are unnecessarily wasted because of stop-and-go and tailbacks on congested roads. A substantial amount of that could be saved with modern transport management systems and traffic information systems.

*Network 21:
Making rail track
more efficient*

Deutsche Bahn has launched its "Network 21" project to set up dedicated rail-track corridors in order to separate rail traffic travelling at different speeds. The project is of pivotal importance in the efforts to eliminate existing bottlenecks and create free capacities to accommodate rising rail transport growth.

*Expand ports and
port connections*

Dismantling capacity bottlenecks in port infrastructure also positively impacts the ecological balance. Congested ports keep ships tied up for longer periods. Timetable delays lead to accelerated crossings to make up for lost time, which in turn results in unnecessarily high fuel consumption and unnecessary emissions.

These examples illustrate the importance of eliminating bottlenecks in order to maximise efficiency in the infrastructure of all modes of transport. Improvements and targeted expansion of transport infrastructure make in total a perceptible contribution to climate protection.

2. Active furtherance of climate-friendly technologies and investment

*Massive
investment in
economy and
environment*

The transport industry has an inherent interest in the development and utilisation of resource-conserving and climate-friendly technologies. Improved engines, alternative fuels and intelligently managed traffic flows mean improved cost-efficiency and higher acceptance.

Reducing fuel consumption and emissions at source is the best climate protection.

It is, therefore, imperative to focus on the development of new technologies and their speedy implementation. Research and technology must be incentivised by legislation and furtherance programmes.

*Continue
investment --
not new levies*

New technologies necessitate investment. Climate protection policies ought not, therefore, additionally burden the transport industry and users, and deprive them of the necessary investment resources. The German automotive industry alone invested 16.6 billion Euros in research and development in 2003 and thereby maintained its lead in respect of automotive safety and environmental protection in the global automotive market – that is equivalent to seven per cent of revenues in the automotive manufacturing industry.

*Expand research
programmes*

These efforts in industry must enjoy backing by the public sector. A major step in that direction is an emphasis on the transport sector, technology and environment in EU and national research programmes. Government, industry and research institutions must cooperate closely and invest in future-oriented projects, like "Car of the Future" and "Green Aircraft".

*Support alternative
engines and fuels*

The outlay invested by industry in the development and use of alternative engines and fuel must be flanked by legal directives and incentives.

3. Improve interfaces and user behaviour patterns

*Responsible use of
transport*

Lowering fuel consumption and emissions in the utilisation of diverse modes of transport must also be further improved in cooperation with the transport industry. This is not a matter of traffic users being controlled and parented by the state. Far more necessary is systematic information, e.g. on economical driving practice such as that successfully communicated to motorists by automotive manufacturers and automobile clubs. Accords on improved flight procedures in the international airline business should be more widely implemented (ICAO).

Optimise interfaces between diverse transport modes

Optimising interfaces between different transport modes is fundamentally important in the efforts to improve user behaviour patterns. Interfaces must function efficiently and reliably in order to make intermodal transport attractive and readily accepted by users.

Elimination of administrative hurdles and better technical networking

Key measures include, among others,

- further dismantling of administrative and technical hurdles (harmonised standards and licensing),
- transparent communication of intermodal services
- and furtherance of supra-company IT solutions.

The target is to optimise connections or transfers from one transport mode to another and to increase utilisation in order to lower costs in comparison with unfractured traffic and enhance the attractiveness of networked systems.

That way, the strengths of individual transport modes can be optimally harnessed so as to improve the economical and ecological efficiency of the transport system as a whole. Better interfaces between transport modes thus contribute additionally to improving the ecological performance of a transport system. This aspect should also be considered in freight transport and logistics masterplans on German and European level.

4. Competition-compatible concepts instead of isolated national legislation

Support for transport industry investments

Any evaluation of climate protection instruments must take into account the contribution already being made by transport providers on the basis of legal regulations and on the basis of their own voluntary commitments. Efforts undertaken by the transport industry on its own must be furthered and sustained with support by the public sector.

International coordination of legal measures

New legal directives ought not ultimately increase the burden borne by the transport sector. The global competitive situation of transport providers must be taken into account. That precludes unilateral legal measures that are not agreed on by major international trading partners.

Mobility must remain affordable

Whatever measures are taken, it is important to ensure that mobility remains affordable. Mobility costs must be socially and economically compatible.

Emissions trading in the transport sector?

Lack of international consistency in emissions trading

Emissions trading as it is presently practised has its shortcomings:

- **Non-participation by**, or lack of emissions reduction targets of, **major industrial states** and strong-growth countries like the USA and China. This greatly restricts the efficiency of emissions trading as a mechanism for furthering global climate protection. The USA is pushing technological developments in the framework of international cooperation ("Asia-Pacific Partnership on Clean Development and Climate") as alternative to the Kyoto mechanisms.
- **Divergent allocation practices** of countries participating in emissions trading. Germany is rather restrictive, other countries issue more generous allowances.
- Introduction of emissions trading in Germany as a steering mechanism alongside **existing environment-related tax and levies**, with which emissions trading is incompatible. Rail traffic, driven by electricity, is already indirectly affected by emission trading through rising electricity prices.

Non-participation by major countries

The globally incomplete ratification of the Kyoto Protocol, respectively the failure of major signatory countries to define reduction targets, significantly restricts the impact of emissions trading on climate protection, as the following figures show:

- The 25 EU member-countries are responsible for a declining share of only 14 per cent of worldwide CO₂ emissions, the USA alone for 25 per cent, and that is rising.
- The share in global emissions of developing countries, like China and India, has risen dramatically between 1990 and 2002 by 39 per cent resp. 69 per cent.
- In the same period, Germany has reduced its CO₂ emissions by 128 million tonnes and is contributing 75 per cent of the reduction level to which the EU is committed under the Kyoto Protocol.

The EU's proposed inclusion of aviation in European emissions trading is also faced by additional obstacles.

Competition distortion from isolated application

There is no guarantee that emissions trading would be enforced in the transport sector in third countries outside the EU, which would distort competition in international air transport to the disadvantage of Europe as a global air transport hub.

International organisations to find a solution

Measures to reduce emissions in air and maritime traffic are excluded from the application scope of the Kyoto protocol because of the international and bilateral character of air transport. So long as agreement on the underlying conditions for application in international air and maritime traffic by ICAO and the IMO is not reached, the operators in those industries in the EU will not be fully able to participate in the Kyoto mechanisms.

Ecological benefits uncertain

It is questionable whether inclusion of the transport sector in emissions trading would have any positive effects at all. The German transport industry is already investing very substantially in fuel-reducing and climate-friendly technologies. Simultaneously, transport demand and performance is increasing. Airlines would, therefore, be almost exclusively active as purchasers of emissions certificates. The certificate price in the entire

European emissions trading system would continue rising, with adverse consequences for the competitiveness and consumer prices in other industries.

Global impulses through EU emissions trading questionable

A selective European practice would also not generate technological impulses for those countries in which there is significant potential for the deployment of more environment-friendly transport means.

If applied directly in road and rail traffic, emissions trading would operate in parallel with other legal steering mechanisms (mineral oil, car and electricity taxes). As a result, the application of steering instruments for climate protection would become ineffective. This would lead to overregulation and pressures on transport carriers, which would unduly increase the cost of mobility.

Conclusions from the perspective of transport carriers

From the viewpoint of the German Transport Forum, the following points should be considered in evaluating the impact on individual modes of transport of the proposed inclusion of emissions trading in the transport sector:

- The introduction of emissions trading in **air transport** only for European airlines would impose dangerous unilateral burdens on the operation of air carriers from a European base and cannot be supported. Prior to the introduction of emissions trading in international aviation, the effects should be thoroughly appraised and a solution found to related, outstanding issues.
- Application of emissions trading in **road traffic** is precluded by the widespread imposition of other legal and fiscal steering instruments in road transport.
- The same applies to **rail transport**. Rail transport should be freed from the indirect effects of emissions trading resulting from its utilisation of electricity as energy. A matching reduction of the energy tax in Germany is possible under the EU energy tax directive and has already been effected in a number of EU countries.
- In the **shipping sector**, the relevant international organisations have already successfully introduced major environmental measures and standards. The coordination of climate protection regulations should continue on that pattern in the framework of the IMO resp., the CCR and the EU.

* German Aerospace Centre (DLR), Institute for Transport Research: The Energy and Emissions Balance of Transport – Previous Development and Future Technical Reduction Potential. Study commissioned by the German Transport Forum, March 2006