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Possible measures and their reduction potential

- A status report by the Federal Environment Agency -

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by

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Background

Greenhouse gas emissions are increasing worldwide. In Germany, CO_2 emissions have been falling since 1990 in nearly all sectors, in some substantially. The only exception is the transport sector, which has only seen a minor CO_2 reduction.

The main reason for transport's small contribution to climate protection so far is the **increase in traffic performance**, which is the product of volume transported and distance travelled in freight traffic or of persons transported and distance travelled in private travel. Between 1991 and 2007, freight transport performance, measured in tonne kilometres, grew by 66 % and passenger traffic performance, measured in person kilometres, grew by 26 %.

To ensure that the transport sector will make a contribution to CO_2 reduction and thus climate protection in the long term, it is necessary to render possible mobility with reduced traffic-induced CO_2 emissions and to initiate and implement a set of additional measures and instruments to reduce CO_2 emissions of the vehicles themselves.

The Federal Environment Agency is therefore proposing a multitude of measures which have the potential to significantly reduce the CO_2 emissions caused by transport and to thus achieve the German Federal Government's climate protection objectives. The measures target both freight and passenger transport and cover all transport modes (heavy goods vehicles, passenger cars, inland waterways, rail, air, pedestrians and bicycles). The Federal Environment Agency suggests a range of complementary measures in the following fields:

- ***Traffic avoidance:*** Influencing / reducing transport demand and shortening distances.
- ***Modal shift:*** Shifting transport to more environmentally friendly modes.
- ***Optimising transport:*** Better utilisation of existing transport capacities.
- ***Economic measures*** and
- direct ***emission reduction*** *on vehicles.*

In line with this, the measures and instruments proposed focus on the following areas:

- ***Traffic-reducing through town planning and transport planning***
- ***Promoting environmentally friendly transport modes***
- ***Economic measures***
- ***Measures to improve vehicle and fleet efficiency***
- ***Consumer information and driving behaviour in road traffic***

The table below provides an overview of the measures and their reduction potential for the years 2020 and 2030. The calculated CO_2 savings result from the divergence from the trend scenario which was calculated using the "TREMOD" model and is based on measures for the transport sector which have already been adopted.

The potentials from the various individual measures proposed by the Federal Environment Agency cannot simply be added up, since the measures may be mutually reinforcing or reducing each others effect. For instance, if fewer heavy goods vehicles are on the road because of a switch to rail, this reduces the absolute reduction that could be achieved by the HGV fleet through e.g. the use of low-friction oils and low-rolling-resistance tyres.

Overview of the proposed measure and their CO2 saving potential for 2020 and 2030

Table 1: Emission reduction in 2020 and 2030 after additional measures as compared to current trend *(all figures in million t CO_2)*

Measure	Red. potential* 2020	Red. potential* 2030	Additional information
Traffic-reducing settlement development and transport planning			
"Town of short distances" planning concept			*Combined*
Integration of town and transport planning			*into*
Reduction potential from these traffic reduction measures	10.2	13.8	*total potential*
Avoiding new road construction	1.8	2.3	
Promoting regional economic cycles	3.4	3.2	
Promoting environmentally sound transport modes			
Rail freight transport	2.1	1.7	
Rail passenger transport	1.9	3.2	
Local public passenger transport	2.6	1.9	
Walking and cycling	5.0	4.0	
Car-sharing	n.d.	n.d.	*Not quantifiable*
Charges and economic measures			
Market-based instruments in aviation	15.6	20.1	
Extension and refinement of HGV road pricing	4.5	4.2	
Increasing the energy tax on vehicle fuels	9.5	17.9	
Introducing a motor vehicle tax based "purely" on CO_2	2.8	4.2	
Abolishing the blanket tax break for commuter journeys	4.3	4.9	
Taxation of private use of company cars	3.7	2.8	
Legislation to improve vehicle efficiency			
CO_2 legislation for passenger cars (Regulation 443/2009)	5.6	10.8	
CO_2 emission limit values for commercial vehicles	2.8	3.4	
Use of low-friction oils	4.5	4.2	
Use of low-rolling-resistance tyres	6.0	7.1	
More and "better" biofuels	10.1 (5.1)**	n.d.	*Legal requirements*
Improving rail's energy efficiency	0.2	0.3	*Potential markedly below 1 million t*
Consumer and driving behaviour			
Consumer information for potential vehicle buyers ("label")	4.1	6.7	
Fuel-efficient driving in road traffic (passenger cars)	4.7	3.7	
Fuel-efficient driving in road traffic (commercial vehicles)	1.7	1.7	
120 km/h speed limit for cars on Federal motorways	3.2	2.9	
Car-pooling	2.5	3.2	

* Individual potentials cannot be added arbitrarily.

** This potential was calculated on the basis of the requirements of the Biofuels Quotas Act and the Biofuels Sustainability Ordinance. UBA believes that the achievability of the objectives defined in this legislation is not assured (gross effect 10.1 million t, net effect 5.1 million t).

Time horizons 2020 and 2030

The most effective measures with the highest potential savings in the medium term – by 2020 – and long term – by 2030 – are:

- Traffic reduction measures in town and traffic planning
- Increasing the energy tax
- Use of market-based instruments in aviation
- CO_2 legislation

The following measures offer relatively large potential:

- Consumer information for potential vehicle buyers, and
- Use of low-rolling-resistance tyres.

Estimation of total potential

Assuming that at least 50 –80 % of the total potential of all measures can be achieved, this would amount to an annual ***CO_2 reduction of about 54 – 87 million t for the 2020 time horizon and of about 64 – 103 million t for the 2030 time horizon*** compared to the TREMOD trend**.**

The ranges given are due to the fact that the measures cannot be added up arbitrarily.

CO_2 emissions [million t CO_2 per year]			
	2005	**2020**	**2030**
Present trend in transport (TREMOD), total	189	202	203
Effect of measures (at least 50 % to up to 80 % of total potential)	0	54 – 87	64 – 103
UBA scenario: TREMOD trend minus potential from additional measures	189	115 – 148	100 – 139
Reduction, in %, compared to TREMOD trend	0	27 – 43 %	32 – 51 %

Whereas no significant reduction in traffic-related CO_2 emissions can be expected in future if the current trend in the transport sector continues, CO_2 emissions from transport need to be reduced by around 40 million tonnes per year by 2020 to achieve the Federal Government's climate protection objectives. A considerably higher reduction than this would be possible through implementing the measures identified above.

The potential indicated can only be fully exploited if **all** identified measures for the transport sector are equally pursued. This will make it possible to reduce traffic-related greenhouse gas emissions in Germany to a tolerable level.