Summary

In its Clean and Efficient programme, the Dutch government has set a goal for the traffic and transport sector to reduce CO_2 emissions in 2020 by 13 Mton to 17 Mton compared to forecast trends under unchanged policy. A study was commissioned as part of the Clean and Efficient programme into measures to achieve further efficiency improvements in the road freight transport sector: incentives, standards or economic instruments. The Netherlands Institute for Transport Policy Analysis (KiM) conducted this study.

Reduction in CO_2 emissions in the past
During the 1990-2006 period, road freight transport in the Netherlands increased by approximately 50%. In that same period, the associated CO_2 emissions increased by 30%. On average, there has been an annual reduction of 1% in fuel consumption and CO_2 emissions per ton-kilometre. This is can largely be attributed to the use of larger lorries.

CO_2 emissions will increase if policy is left unchanged
If policy remains unchanged, CO_2 emissions from road freight transport will by 2020 continue to increase to 6.4 Mton to 8.7 Mton, depending on the future scenario. This takes into account autonomous reductions in CO_2 emissions per ton-kilometre of 1 to 1.5% per year. Increased CO_2 emissions from road freight transport can be attributed to economic growth, which leads to the increased flows of goods.

Substantial fuel savings are technically feasible
The literature describes a broad range of technical options to increase the efficiency of – and consequently reduce the CO_2 emissions produced by – road freight transport. Some technical measures facilitate a reduction in CO_2 emissions per lorry-kilometre in excess of 15%. Although fuel is a major cost factor in road freight transport, these technical reduction options are not automatically applied. Transporters often consider the methods too expensive. Stabilisation of CO_2 emissions in 2020 compared to 1990 is only possible through very costly measures that are not cost effective for transporters and shippers.

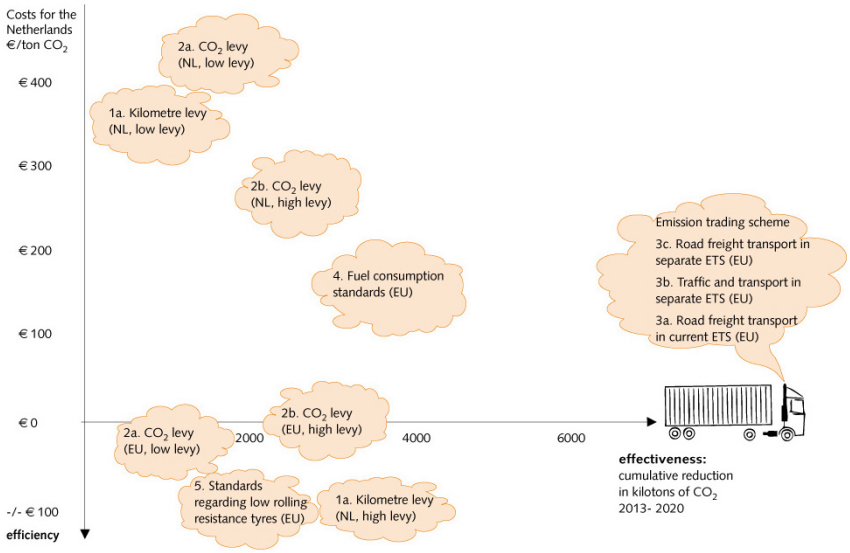
Six possible policy instruments compared
This study analyses the impact and social costs and benefits of six policy instruments to achieve a further reduction of CO_2 emissions in road freight transport in the Netherlands. These policy instruments are:

1. kilometre levy for road freight transport;
2. CO_2 levy on diesel fuel;
3. inclusion of road freight transport in an emission trading scheme;
4. establishment of CO_2 emission standards or fuel consumption standards for heavy goods vehicles;

5. establishment of standards for heavy goods vehicles regarding low rolling resistance tyres (LRRT);
6. encouragement of a reduction in CO_2 emissions by means of a public information and innovation programme.

The performance of the six instruments is described and several variations in the degree to which the instruments are deployed were analysed. In order to assess the instruments, their economic legitimacy, effectiveness, social efficiency and degree of public support were also analysed.

Figure S.1
Comparison of various policy instruments



Some instruments are highly effective

Figure 0.1 compares the analysis results of the instruments to reduce CO_2 emissions until 2020, assuming introduction in 2013. The position of the individual instruments in the figure depends on their effectiveness and efficiency. Effectiveness was measured in terms of cumulative reduction of CO_2 emissions in kilotons (kton), while efficiency was measured in terms of social cost-effectiveness[10].

The standardisation instruments (e.g. normative guidelines for lorries regarding CO_2 emissions, standards regarding low rolling resistance tyres and the cap of an emission trading system) are effective, as they actually prescribe a minimum reduction, regardless of circumvention or evasion. There is, however, a risk that the impact of such instruments will not be achieved until after 2020, because actual implementation must withstand time-consuming EU processes.

Including road freight transport in a current or separate emission trading system (ETS) will have the greatest effect in 2020

[10] Effects outside of CO_2 reduction are expressed in monetary terms.

(CO_2 emissions reduced by 2 Mton to 5 Mton per year). When included in the current EU-ETS, actual reduction of emissions in the road freight transport sector in the Netherlands would be limited to approximately 0.1 Mton in 2020, as it would be cheaper for road freight transport to buy emission rights elsewhere.

Social cost-effectiveness varies widely
A kilometre levy, involving a high rate, is best in terms of social cost-effectiveness. EU standardisation of tyre rolling resistance is also cost effective[11]. In practice, the social benefits (excluding CO_2 reduction) of an EU-wide CO_2 levy on diesel balance the social costs.

As regards the other instruments, social cost-effectiveness is relatively poor compared to the instruments mentioned above. Standardisation of fuel consumption significantly increases vehicle costs. If the kilometre levy for road freight transport is low, the social cost-effectiveness will be relatively poor, as only limited benefits would be gained compared to the high initial system costs for collecting the levy.

The social cost-effectiveness of a CO_2 levy on diesel for road freight transport alone is relatively poor, due to high system costs for separate fuelling systems (administrative or physical). A CO_2 levy on diesel fuel in the Netherlands alone is subject to high social costs, as some of the road transport companies will fill up their vehicles abroad.

If road freight transport is included in the current ETS, 'leakage effects' will occur (i.e. 'carbon leakage'). The idea is that the inclusion of freight traffic in the current ETS will result in costs for emission rights within the European Union (EU) that are so high that energy-intensive companies will move away from the EU. For a separate emission trading system in Europe for road traffic in general or for road freight transport specifically, the costs for emission reductions for road traffic and the transaction costs will be relatively high.

No support for certain instruments
The implementation of certain instruments depends on social support, legal options and – ultimately – political will. The private sector does not support new economic instruments that increase the burden for transporters and shippers. In the face of recent agreements with the road transport sector concluded as part of the covenant on sustainability, it is also unlikely that the introduction of new pricing instruments will occur during the current government's term of office. Transporters and shippers prefer the continuation of current 'flanking' policy in the form of information, incentive and innovation programmes. The sector does, however, support legal standards for lorry fuel consumption and tyre rolling resistance, provided that the standards apply throughout the EU and that comparable standards are introduced for other modes of transport as well.

[11] The question, however, is why more efficient tyres are not yet in use, whilst they can theoretically result in significant reductions in transport costs. The market may not be correctly informed or the additional costs may be underestimated.

Combination of instruments
The various policy instruments analysed here are not mutually exclusive. A combination of a CO_2 levy with road freight transport in any type of emission trading system is not likely to be implemented due to the lack of public support and the inefficiency of such an approach. Synergy benefits can be obtained by, on the one hand, introducing levies or standards and, on the other hand, implementing flanking measures in the form of information, incentive and innovation programmes. Although the effectiveness of flanking measures is limited, they do slightly 'relieve the pain' caused by the other instruments.

Establishing standards regarding low rolling resistance tyres is efficient and cost-effective, which means that it can be effectively combined with other instruments.

If realising substantial emission reductions in the road freight transport sector itself is desirable, this can be achieved by including road freight transport in the EU-ETS, combined with the establishment of guidelines for lorries regarding CO_2 emissions. Standardisation will ensure that a greater part of the reduction is actually achieved within the road freight transport sector.

Short-term possibilities
Pricing using a CO_2 levy at the EU level is effective, but currently lacks support. As long as support is lacking and without a concrete proposal from the EC, a Dutch kilometre levy can only achieve limited emission reductions.

There is a long EU road to travel before a standard for lorry fuel consumption (expressed in terms of CO_2 emissions per kilometre driven or capacity supplied) can be legally specified. In working to achieve that goal, however, there are still benefits to be gained from the immediate implementation of unambiguous CO_2 test methods and CO_2 energy labels. This applies first to lorry engines and in the longer term to the lorries themselves. In taking this approach, a labelling system can be developed that can be implemented relatively soon as part of an incentive scheme for more fuel-efficient lorries or as a differentiating factor in a kilometre levy scheme.