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ANALYSIS

Inclusion of road transport in emissions trading will not help the climate

A critical evaluation of the inclusion of road transport in the EU Emissions Trading System

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ABSTRACT

A range of actors have proposed the inclusion of road transport in the EU Emissions Trading System (ETS). This analysis reviews the existing literature on the topic and concludes that the inclusion of road transport in the ETS would not be an effective instrument to achieve climate change objectives in the sector:

- The weak price signal in the medium term delays innovations and increases their cost.
- Incomplete information and unpredictability lead to poor investment decisions on the part of consumers.
- Economic efficiency in theory does not always lead to socially desired outcomes in practice.
- Upstream emissions would not be sufficiently covered by the scheme.

An effective climate change policy should rather be based on ambitiously developing EU-wide CO2 emission standards and adjustments to fuel taxes.

CONTENT

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Executive Summary

The almost **total decarbonisation of the transport sector** is required if current climate change targets are to be met. This will only be possible through infrastructure adjustments and large investments in vehicle and fuel technology. Many of those changes and investments must be initiated soon, because they will only have an impact in the medium and long term. From 2030 onwards, only zero-emissions cars should be added to the current stock in order to attain the goal of a zero-emissions car fleet by 2050.

A number of actors are currently suggesting indeed or pressing for the inclusion of road transport in the European Union Emissions Trading System (ETS) (see e.g. Bundesverband der Deutschen Industrie 2016; Bundesverband Emissionshandel und Klimaschutz 2014; Centrum für Europäische Politik 2015; IW Köln/TU Delft 2016; Verband der Automobilindustrie 2014). For this to be effective, this means that the ETS would have to send the right price signals already today in order to exert pressure on the transport sector in favour of innovation and action. However, the current carbon price in the ETS, amounting to about 1.5ct per litre of petrol, does not provide such an incentive at all. Even if the price substantially increases in the medium term (which is uncertain), the price **signal may come too late** for suitable alternatives to be developed and provided. In particular, **unpredictability and incomplete knowledge** about the ETS and its development would lead consumers to take investment decisions when buying a car which may turn out to be uneconomical in the future.

Meeting the challenges of the transport sector cannot be left to one **imperfect instrument,** such as the ETS. Firstly, the success of the ETS is uncertain – it may fail if societal and political pressure to weaken or abolish the ETS becomes strong enough. Secondly, **economically efficient market results can be undesirable from a social perspective**. Emissions trading only addresses the extent to which greenhouse gas (GHG) emissions are reduced, but not the social consequences. At worst, this could lead to **reduced mobility**. The possibility of such an outcome has to be prevented through the provision of adequate alternatives.

Including the transport sector also affects other industries which are already covered by the ETS. As abatement costs in the transport sector are high, reductions in GHG emissions will primarily have to come from other sectors. This creates the risk of **shifting the burden of costs from the transport sector to other sectors**. Such a shift may be desirable from an economic point of view but could also result in changes to the economic structure which are neither politically nor socially sustainable.

Lastly, an important source of emissions cannot be included. The production of fossil and biogenic fuels takes place mainly outside the EU and can therefore not be incorporated by the ETS. The production of biofuels, however, is a crucial determinant of their carbon footprint. **Neglecting the upstream chain could result in increases in the GHG-intensity of transport fuels** (see chapter 3.5).

Thus, the **ETS in its current form is not a suitable instrument for achieving climate change objectives in the road transport sector**. Including the transport sector would not solve the existing problems of the ETS, but bring introduce more difficulties to an instrument already in urgent need of reform. Growing problems would also increase the societal and political pressure on the ETS, which might be subsequently weakened.

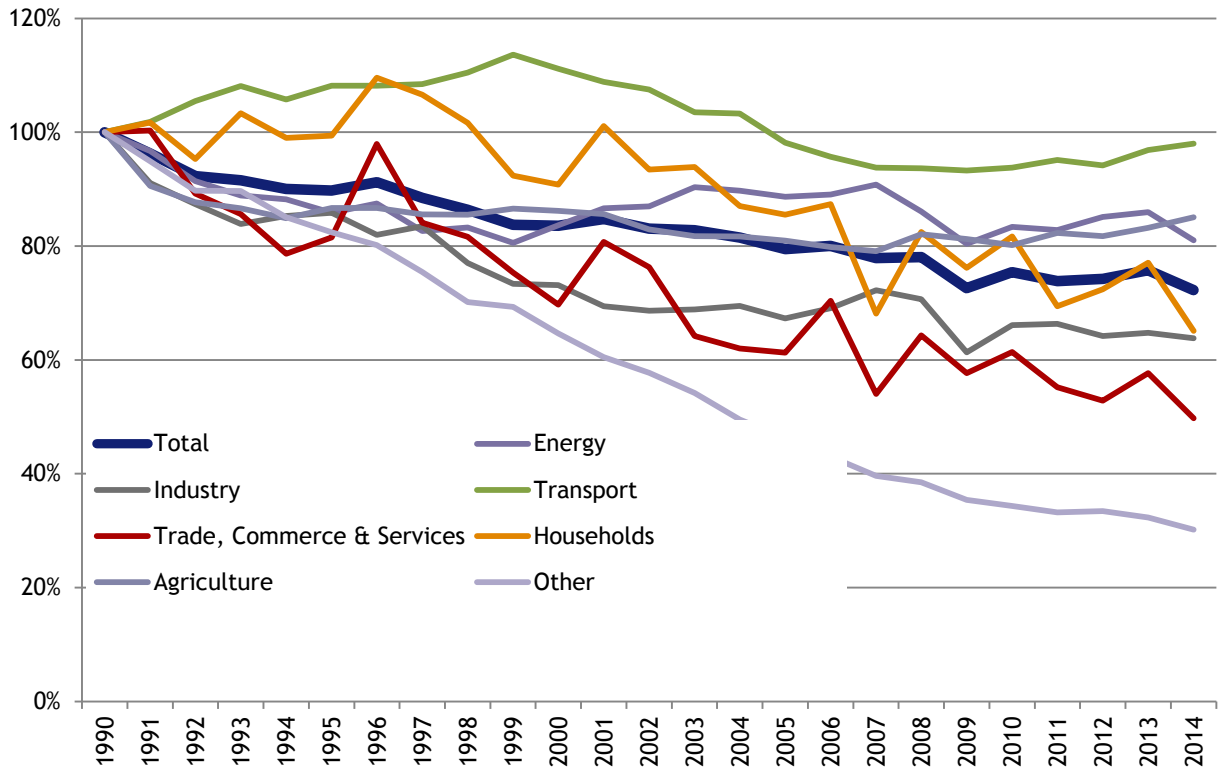
Instead, increases to fuel taxes on fossil fuels in the transport sector and the ambitious development of EU-wide CO2 emissions standards beyond 2022 are recommended.

1 Climate protection in the transport sector

Germany is committed to cutting its GHG emissions by 80-95% by 2050 compared to 1990 levels. By signing the Paris Agreement in April 2016, Germany has further committed itself to undertake the necessary steps to contribute to "hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels". To meet these targets requires effective climate change mitigation policies that go well beyond current efforts.

In particular, the transport sector has not managed to significantly reduce its GHG emissions, with road transport accounting for the largest share. The goal, however, is clear: in order to reach national and international climate change objectives, road transport has to be almost entirely decarbonised by 2050.

Figure 1: Development of GHG emissions in Germany by sector



Source: own illustration based on data provided by the German Federal Environmental Agency

Decarbonising road transport requires measures and instruments that address both the existing car fleet and new vehicle registrations. With regard to passenger cars, the main instruments currently in use in Germany are the EU-wide CO2 emissions standards, fuel taxes on petrol and diesel, and to a lesser extent annual circulation taxes.

Different actors have recently proposed to include road transport in the ETS (see e.g.. Bundesverband der Deutschen Industrie 2016; Bundesverband Emissionshandel und Klimaschutz 2014; Centrum für Europäische Politik 2015; IW Köln/TU Delft 2016; Verband der Automobilindustrie 2014). In this context, some have also proposed that inclusion in the ETS would allow for CO2 emissions standards in the future to be less ambitious, or even that current standards could be extended beyond 2021 without any tightening of emissions limits. On the basis of their own experience and the work of different transport organisations, the authors of this paper argue that such a proposal undermines effective climate change policy and jeopardises the successful decarbonisation of road transport.

2 Imperfect emissions trading under incomplete market conditions

In theory, emissions trading is an environmentally effective and economically efficient instrument of climate change policy and should achieve externally determined GHG reduction goals at the lowest cost. The emission quantities available can be accurately capped and reductions are subsequently made where it is most economical to do so. However, several practical problems impede the successful implementation of the elegant mechanisms of emissions trading in practice. The EU Emissions Trading System (ETS) operates in an environment of incomplete markets and irrational human behaviour. The price incentives that the trading system is supposed to create have not had the desired effect. Moreover, as humans designed the system, the regulatory framework was determined politically. The existing ETS is in its current form unable to contribute to the achievement of the climate change objectives in accordance with the Paris Agreement. Many built-in exceptions and special arrangements have significantly weakened the system's mechanisms from the beginning. The existing ETS is a malfunctioning instrument operating under incomplete market conditions.

At the same time, it is eminently possible that a functioning EU ETS contributes to the achievement of ambitious climate change targets. However, In order to make the ETS work towards such climate change objectives, extensive reforms would have to take place. These reforms would need to prescribe an emissions cap in accordance with the Paris Agreement and close existing loopholes in the system (Ekardt, 2016).

After a steep decline over the past months, the allowance price is currently around €6 per tonne CO2 (as at 3/6/2016). This corresponds to about 1.5 cents per litre of petrol. In contrast, the average price in 2015 per litre of petrol in Germany was more than 130 cents. Fuel excise alone in Germany accounted for 65.45 cents of that price. This weak price signal is a symptom of the many problems of the ETS and seems to indicate that the trading system in its current form is not the right instrument to address the tremendous challenges facing the transport sector.

3 EU ETS: inadequate instrument for the transport sector

The suggestions made on the part of the industry involve the inclusion of road transport into the existing ETS instead of the further development of ambitious CO2 emissions standards and increases to transport fuel taxes. In the following, it will be explained why these measures would undermine effective climate action.

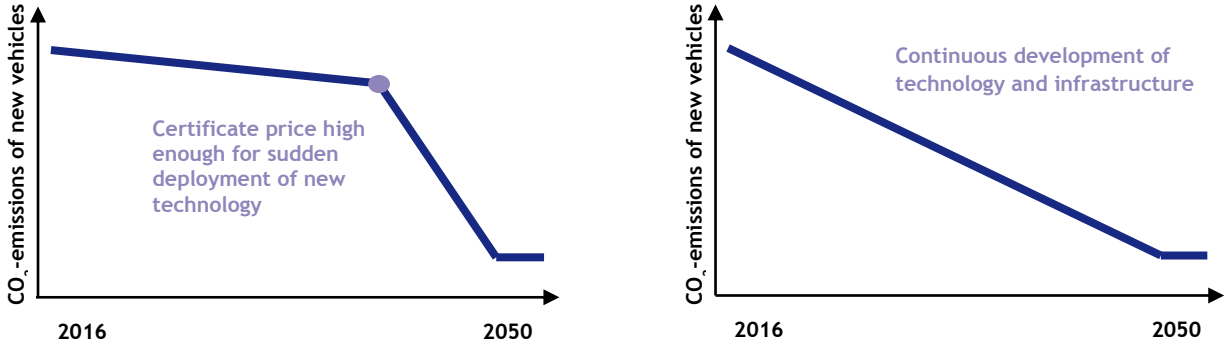
3.1 A weak price signal will delay innovation and increases cost

The average lifespan of a passenger car in Germany is eighteen years. In order for the passenger car fleet to be decarbonised by 2050, all newly registered cars from 2030 onwards will have to be zero-emissions cars. The structural change required to achieve this must take place within the next two decades and can only be achieved through innovations in the automobile sector as well as new mobility concepts and modal shifts. These innovations can be induced either by a technology push, i.e. producers introducing new technology to the market, or by a technology pull, i.e. consumers demanding efficient technology (CARB, 2014; Grubb, 2004; Lee, 2011 in ICCT 2014).

EU-wide CO2 emission standards contribute to a technology push. They prescribe clear targets that need to be met in order to achieve their objective (newly registered vehicles with lower emissions) over a clearly defined time period (until 2021). The inclusion of road transport in the ETS works as a technology pull. The rising cost of fossil fuels will result in increasing demand for low-emission vehicles: However, the impact of this rising price on demand depends on the price. Rational consumers will only demand clean technology and be willing to pay a higher price for it once the price for fossil fuels is high enough. The dominant strategy of car manufacturers, therefore, is to deploy innovations on the market only when there is sufficient demand.

According to calculations by Cambridge Econometrics (2014) and Mock et al. (2014), allowance prices of €370 to €440 would be necessary to produce the same effect as emission standards of 95g/km for 2021. To put this in context: the average allowance price between May 2013 and April 2015 was just over €6. Therefore, in the short run, the integration of road transport into the ETS without tighter regulatory limits would have no steering effect on the automobile industry. Additional allowances would simply be bought and CO2 emission reductions would take place in sectors with lower abatement costs. That is consistent with the initial idea of the trading system. But it would take years until the number of allowances would be low enough for the costs on the demand side to cause a technology pull. Necessary innovations would consequently have to take place and be introduced to the market within a much shorter time frame. As a consequence, development costs would be significantly higher than in the case of a stable and predictable regime over several years, which can be achieved for instance through emissions standards (Mock et al. 2014; Öko-Institut 2015) (see Figure 2).

Figure 2: Schematic development of CO2 emissions of new vehicles until 2050 regulated by the EU ETS (left) and EU emission standards (right)



Source: adapted from Mock et al. (2014)

3.2 Incomplete information and unpredictability for consumers

The emissions trading system's theoretical advantages are played out under perfect market conditions. This means that rational actors are able to act under consideration of complete information. In reality, these conditions never exist. Nevertheless, it can be expected that participants in the current ETS — companies that run corresponding industrial facilities — act relatively rationally and have a good knowledge of how the trading scheme functions. The road transport sector is different in this regard. Even in the case of an upstream approach, i.e. when distributors of fossil fuels have to buy and trade allowances, consumers would still participate indirectly in the ETS because the costs of CO2 allowances would be passed on to them. While this is already the case for electricity, the difference is that private consumers of electricity can easily switch between providers and thereby leave the risk of investment decisions with the latter. When purchasing a new car, however, the consumer bears the risk.

Future price developments in emissions trading are more difficult to predict for consumers than, for example, a tax increasing step-by-step. A sudden sharp increase (price shock) would ultimately occur, even if the initial price signal was relatively weak. The resale value of already purchased cars without efficient technology would drop suddenly and mobility costs would increase substantially. As consumers have less knowledge about market mechanisms and price developments, they would be disadvantaged in comparison with corporate market participants and thus be exposed to high individual economic pressure.

While consumers do react to changing prices (as indicated by the successful German ecological tax reform), they do not sufficiently incorporate future costs in their investment decisions when buying a new car (Öko-Institut 2015). For that reason, efficient technologies often do not prevail on the market despite paying off in the long run (see e.g. Greene et al. 2013). Therefore, price signals should be predictable and communicated well. If the price development is hard to predict, the risk of consumers making uneconomical investment decisions increases.

On January 1st 2016, 60 million cars were registered in Germany, two thirds of which were privately-owned passenger cars. A significant proportion of these car-owners could be affected by a price shock if they did not take appropriate investment decisions well in advance. As a result, politicians might be tempted to appeal to voters by pressing for weakening the trading system, thereby jeopardising its success as a climate change policy.

The same risk also applies to other price instruments, such as taxes and fees. Their development, however, is easier to plan and communicate, which in turn can soften the blow of a price shock and lower the number of consumers affected.

3.3 Economic efficiency does not always lead to socially desired outcomes

Economic efficiency is no guarantee for a socially acceptable market result. Extending emissions trading would certainly lead to a shifting of resources between different sectors, because the cost of climate action would decrease in the transport sector and increase in other sectors in comparison to the status quo (see e.g. Cambridge Econometrics 2014; Paltsev et al. 2015; Transport & Environment 2014). In turn, this would lead to economic shifts which may be neither politically desired nor sustainable. For instance, it can be economically efficient to relocate whole industries to other countries. It could also be economically efficient to substantially reduce mobility as long as no viable transport alternatives exist. The willingness of society and politics to accept those economically efficient market results cannot be taken for granted.

In road transport, relocation is not a possibility: trips to work or to transport something cannot simply be relocated to other countries. Other alternatives are limited and abatement costs, it has been estimated, will be high (Öko-Institut et al. 2014), inter alia because fuel taxes on petrol and diesel are already many times higher than the current allowance price[1]. It is therefore often assumed that road transport can deal with very high allowance prices without any displacement effect taking place (see e.g. Transport & Environment 2014) or pressure for innovation developing (Mock et al. 2014). The high willingness to pay in the road transport sector could therefore result in the latter buying its way out of CO2 emissions reductions and shifting the pressure to reduce emissions to other sectors.

Whereas it is theoretically efficient to reduce emissions where abatement costs are lowest, the risk of carbon leakage may lead to a reduction of emissions merely on the regional level (EU) while relocating them globally. In the short run, such a risk is rather small due to the low allowance prices in the ETS. If, however, a much higher cap is set in the ETS in the long run, the scarcity of emissions allowances would be reflected in the prices. Some sectors, such as parts of the chemical industry where non-substitutable processes cannot be physically run without emitting CO2, would have to compete for allowances with the fossil fuelled individual transport, despite there being alternative technologies available. This would ultimately lead to CO2 emission reductions, but not to the desired outcome in terms of economic policy.

Since a global emissions trading scheme is currently not feasible, the second-best option would be a “European emissions trading scheme for all sectors with perfect carbon leakage protection for highly competitive industries” (IW Köln/TU Delft 2016, authors’ translation). It remains unclear though how such perfect protection could be achieved. In practice, this would most likely be in the form of many exceptions and loopholes which would make the ETS unnecessarily complicated and weak. In the past, fear of carbon leakage and international competition were among the reasons why allowances have been distributed so generously (Transport and Environment 2014). The inclusion of the transport sector could exacerbate the situation and reduce the system’s effectiveness even further.

[1] The current allowance price of around €6/t CO_s (3/6/2016) corresponds to about 1.5 cents/litre. The tax rate for petrol (diesel) is 65.45 cents/litre (47.04 cents/litre).

3.4 Upstream emissions are not sufficiently covered

Even if the ETS used an upstream approach in the transport sector targeting the distributors of fuels, a portion of the emissions originating from fuel production would still not be taken into account. For example, production stages outside the EU would not be covered. Biogenic fuels are considered emission-free regardless of how they are produced (Öko-Institut 2015). The incentive to develop and produce less carbon-intense fuels would be lower than in the case of instruments such as the fuel quality directive; sustainability criteria concerning the production of biofuels would in some circumstances not have to be considered at all (ibid). However, the carbon footprint of biofuels depends especially on their production and is not necessarily lower than the carbon footprint of conventional fuels. The ETS would neglect important parts of the upstream chain if not complemented by additional instruments.

4 Conclusion: effective climate action through a combination of targeted policies

A more ambitious environmental and climate change policy for road transport is desperately needed. The sector will otherwise jeopardise climate change objectives which are already proving difficult to meet. It is crucial to address both the emissions of both newly registered vehicles and the existing fleet. An effective and efficient strategy will comprise a combination of regulatory as well as economic instruments.

- An **ambitious further development of the EU emission standards** provides, as outlined above, the necessary incentive for innovations in the automobile industry.
- **Further development of fuel taxes on petrol and diesel** can deliver the required demand-side incentives both in terms of new purchases and the use of vehicles. A step-by-step increase in tax rates over a specific period of time enables consumers to plan ahead. The tax rates should reflect the external costs of different transport fuels –current lower tax rates on diesel contradict this goal.
- In the long run, **intelligent comprehensive road-pricing** can play a central role in achieving a sustainable and efficient mobility policy.
- More **differentiated annual circulation taxes** or **registration taxes** can be used to provide additional incentives and to finance assistance measures for low-emission mobility.
- **Environmentally harmful subsidies** for road transport, such as tax privileges for company cars and tax allowances for commuters need to be **removed**.
- Finally, a range of different instruments can support **reduced use of private transport and modal shifts** without the inhibition of mobility.

The EU ETS is in need of substantive reform, regardless of the road transport sector. It can only deliver the necessary reductions in GHG emissions when exemption clauses are being removed and an adequate cap is agreed.

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