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AT A GLANCE

Executive Summary – June 2019

Study

A carbon tax for the transport sector?

Mobility and mobility costs for private households

Individual mobility is an essential part of people's everyday lives. In Germany, each person travels an average of 15,000 kilometres a year by road and rail – mainly by car. Young and older people are significantly less mobile than employed people, trainees and students. Full-time employees are well above the average travel-distance at almost 21,500 km per year. People living in rural and small-town areas are also more mobile than the inhabitants of large cities. Shopping and leisure activities are the most frequent reasons for mobility, followed some way behind by journeys to workplaces. Among the working population, men have significantly longer journeys to work than women. Transport volumes have risen by ten per cent since 2002, driven by commercial, leisure and commuter traffic. Cycling and public transport have slightly increased their share of the total passenger traffic since 2002.

Over the past 20 years, fuel prices have risen by around 40 per cent in real terms. However, consumer price developments have caused the real value of the energy tax on fuels to fall by around one fifth since 2003 and to return to 1998 levels. Since the beginning of the 1990s, the specific fuel consumption of the existing fleet (weighted according to the mileage of the passenger cars) has fallen by almost one fifth for petrol-driven passenger cars and by one tenth for diesel-driven passenger cars.

In public transport, on the other hand, tariffs have risen by around 60 per cent in real terms since the beginning of the 1990s. On average, households therefore spend a good 11 euros on 100 kilometres of public transport. For passenger cars, they spend 5.70 euros for each 100 kilometres on fuel.

Distributional effects of mobility costs for private households

Almost 80 per cent of all private households in Germany have at least one car. In the upper two deciles, more than 40 per cent of households own two or more cars. On average, 10.5 per cent of net income is spent on transport. That's 14 per cent of consumer spending. Transport expenditure is the second most important category of private consumption expenditure after housing expenditure. The shares of income spent on transport are largely proportional in all income deciles. However, the „middle" income groups (between the 4th and 7th deciles) spend more, that is 11.3 to 12.6 per cent on mobility. Fuel is the largest single item of transport expenditure, averaging 3.6 per cent of the net income. This share has increased significantly over the last 20 years (by an average of 1.2 percentage points). Employee households, trainees and students spend a larger proportion of their net income on fuel. Fuel costs as a share of net income are regressively distributed. Households in the 8th to 10th deciles spend a smaller proportion of their income on fuel. In addition, the energy taxes on fuels are regressively distributed.

In terms of the type of region, households in larger cities spend less on fuel than those in rural areas. Singles and single parents spend a relatively low proportion of their income on transport. Couples with children do not show significant differences to other groups in terms of the importance of transport expenditure in relation to income. Employed persons spend a higher share of their income on transport expenditure than inactive persons, in particular unemployed persons or persons receiving basic social security.

Total expenditure on motorised private transport has remained almost constant over the past 20 years. This is mainly due to the slightly lower acquisition costs and fixed maintenance costs of cars (workshop, insurance and taxes). In particular, the lower income groups, households in the larger cities, trainees and students spend a disproportionately large part of their income on public transport.

Revenue and distributional effects of a carbon tax for the transport sector: Policy scenarios

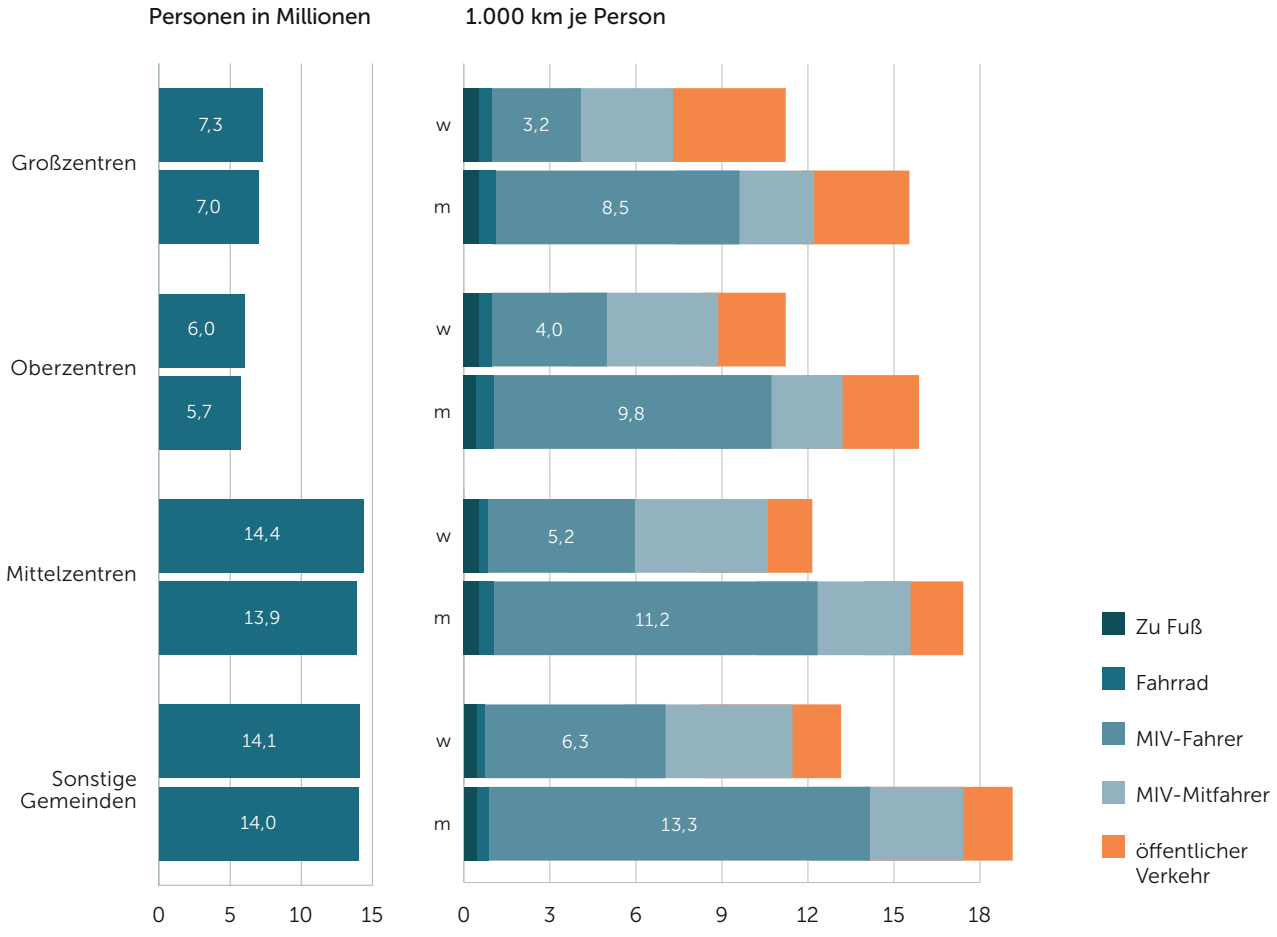
In this study, we have analysed the costs and distributional effects of policy scenarios to increase fuel taxation as part of an uniform carbon pricing for private households. The reforms should not place any additional burden on private households as a whole ("revenue neutrality"). Furthermore, it is intended that higher burdens for individual groups should be avoided, especially for low-income households and commuters. To this end, part of the revenue from the carbon tax will be refunded to all inhabitants of the country in the form of a uniform per capita transfer (climate bonus). A carbon tax would place a particular burden on commuter households. For this reason, the distributional effects on commuter households are considered in detail. Part of the revenue will be used to increase the commuting allowance or to introduce a mobility allowance.

Scenarios

We have first examined an additional carbon tax on fuels, which will be introduced at a rate of 40 euros per tonne of CO_2 in 2020 and increased to 80 euros per tonne of CO_2 by 2030. In the first scenario, the existing different energy tax rates between petrol and diesel remain unchanged. Total energy tax rates in 2030 will thus amount to 0.8439 euros/litre for petrol and 0.6828 euro/litre for diesel. At the filling station, this means a price increase of 15 per cent for petrol and 20 per cent for diesel. With an assumed price elasticity for the fuel demand of (optimistically) -0.8, CO_2 emissions from petrol could fall by 12 per cent and by 16 per cent for diesel by 2030.

In the second scenario, the previously different energy tax rates on petrol and diesel are additionally adjusted to a uniform 0.5625 euros per litre by 2030 (the current fuel tax rates are 0.6545 euros/litre for petrol and 0.4704 euros/litre for diesel). The consumer price at the filling station would rise by almost eight per cent for petrol and by 29 per cent for diesel by 2030. This price increase mainly affects commercial transport and business, but

Personen und km je Person 2016 – nach Gebietstypen, Geschlecht und Verkehrsmittel



Quellen: Mobilität in Deutschland; Statistisches Bundesamt; eigene Berechnungen.

also high-income households who mainly drive diesel vehicles. Under the assumptions made on fuel demand, CO_2 emissions would fall by 6.2 per cent for petrol consumption and by 22.8 per cent for diesel consumption.

Relief instruments

In order to ease the burden on households, we have modelled the effect of increasing the commuting allowance from currently 0.30 euros to 0.40 euros per kilometre travelled by 2030. In another scenario, we have converted the increased commuting allowance into a mobility allowance of 0.155 euros per kilometre travelled in 2030 in a revenue-neutral manner. The mobility allowance is deducted from the tax liability as tax relief, thus relieving all commuters with the same amount per kilometre travelled, irrespective of the individual tax rate. We would reimburse the remaining part of the additional revenue from private households in the form of a uniform per capita climate bonus. To this end, an appropriate transfer-mechanism would have to be introduced that effectively reaches all residents. Alternatively, the electricity tax, the Renewable Energy Sources Act (EEG) levy or other taxes and levies such as income tax or value added tax could be reduced.

Revenue

Our simulation calculations for the revenue and distributional effects do not take into account the adaptive responses of households and other economic impacts. An additional carbon tax on fuels amounting to 80 euros per tonne of CO_2 would generate an additional annual tax revenue of 15.5 billion euros in 2030, of which nine billion euros (58 per cent) would come from private households. Increasing the commuting allowance to 0.40 euros per kilometre travelled would relieve private households by 2.7 billion euros. The remaining revenue of 6.3 billion euros generated by private households will be refunded to them as a uniform per capita climate bonus amounting to 76 euros per inhabitant per year.

If the existing fuel tax rates were additionally adjusted, the additional tax revenue would rise to 17.2 billion euros, the proportion paid by private households would fall to 8.1 billion euros (47 per cent) and the per capita climate bonus would fall to 65 euros per year. However, this does not take any adjustments to the vehicle tax into consideration, which is currently much higher for diesel vehicles than for petrol vehicles.

According to the scenarios chosen, if the fuel tax were increased by 80 euros per tonne of CO_2, the state would generate around 6.1 billion euros in additional revenue from the corporate sector in 2030. If diesel taxation were aligned with that of petrol, there would even be 8.6 billion euros. These additional revenues could be used to

Familie mit 2 Kindern unter 16 Jahren, mindestens 1 Arbeitnehmer und Pendler mit mindestens 40 km Arbeitsweg

Perzentil Haushaltsnettoäquivalenzeinkommen: 55 %

	Euro/Jahr	Euro/Monat	% Haushalt Nettoeinkommen
Haushaltsnettoäquivalenzeinkommen	25.720	2.143	40,0 %
Haushaltsmarkteinkommen	82.771	6.898	128,7 %
Haushaltsnettoeinkommen	64.299	5.358	100,0 %
Ausgaben insgesamt für			
• Strom	1.126	94	1,8 %
• Wärme	1.310	109	2,0 %
• Kraftstoffe	3.491	291	5,4 %
Belastung Kraftstoffe	-562	-47	-0,9 %
Entlastung Einkommensteuer	+202	+17	0,3 %
Klimabonus	+330	+27	0,5 %
Nettoeffekt	**-31**	**-3**	**0,0 %**
Nachrichtlich:			
Energieverbrauch			
• Strom, kWh/Jahr	4.096		
• Wärme, kWh/Jahr	12.013		
• Kraftstoffe, Liter/Jahr	2.382		
• Fahrten zur Arbeit, km/Jahr	33.286		

compensate companies where necessary and to support the development and introduction of low-carbon technologies, low-carbon means of transport and the associated infrastructure.

However, the cost and distributional effects of a CO_2 tax on commercial transport, as well as possible relief and promotion mechanisms, are not examined separately in this study.

Distributional effects

We have simulated the distributional effects on private households on the basis of the individual data from the German Socio-Economic Panel (SOEP). If the additional revenues are not redistributed, each household will on average be burdened with an additional 0.5 per cent of its net income in 2030 due to the higher fuel taxes. These burdens remain largely constant in relation to net income across the income groups, only starting to decrease from the 8th decile. While the burdens for petrol in relation to net income are significantly lower in the higher income deciles, i.e. regressive, this effect is hardly pronounced for diesel; only in the top decile is the relative burden lower.

- Increasing the commuting allowance especially relieves the burden on the middle and the higher income groups, which are more strongly dominated by the working population and commuters.

- Converting the commuting allowance into mobility allowance – whereby all commuters receive the same tax relief – relieves the burden on commuters with lower incomes at the expense of commuters with higher incomes.

- The uniform per capita climate bonus relieves the burden on poor households in relation to their net income significantly more than on rich households, and thus has a progressive effect on the overall net burden of the reform.

Overall impacts

Overall, there are only slight redistributive effects of a carbon tax between different income groups. The climate bonus counteracts the slightly regressive burden effects of higher fuel taxation and leads to a moderate redistribution in favour of the poorer population.

Even for the different types of households, the redistributive effects are relatively low. Increasing and reforming the commuting allowance will make the policy generally burden-neutral for commuters. However, commuters with higher incomes are slightly burdened, while those with lower incomes are relieved. The conversion of the commuter allowance into a mobility allowance reinforces this effect. Families with children and households in rural areas are also slightly burdened, while pensioner households are slightly relieved.

It must also be taken into account that within the income deciles there are different burdens caused by a carbon tax depending on occupational and private requirements as well as household preferences. However, analyses of the spread of the net burden show that only in relatively few cases does the burden exceed 0.5 per cent of the net income. In the case of higher burdens, specific and additional compensation requirements may arise for individual groups.

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