Reshaping mobility

A tax and duty concept for climate-friendly and socially fair transport up to 2050

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RESHAPING MOBILITY

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The current system for taxing mobility stems from a ‘fossil age’. It no longer meets the requirements of sustainable, fair and individual mobility – and the more demanding the legislator is in readjusting and tightening the climate protection targets in the individual sectors, the less it meets this goal. The system of taxes and duties in the transport sector must be aligned differently. There are three central reasons for this:

a) Mobility must be redirected to make a fundamental contribution to achieving **climate targets**.

b) For **more justice**, social compatibility must be established and existing injustices and climate-damaging privileges must be eliminated.

c) The change in transport and mobility must be taxed in such a way that Germany retains its **financial capacity** to act.

The **study ‘Reshaping mobility: fair, individual and sustainable’**[3] shows how this can be achieved. In this study, the Öko-Institut (Institute for Applied Ecology), the Forum Ökologisch-Soziale Marktwirtschaft (FÖS) and Prof. Dr. Stefan Klinski of the Berlin School of Economics and Law jointly investigated and evaluated measures and fiscal instruments commissioned by the German Environment Agency (UBA). This brochure describes the results and presents the key recommendations of the study.

1 Germany must change course

Many people in Germany want a stringent and effective climate policy. At the same time, everyone wants to be mobile at all times – whether by car, train, plane, public transport, on foot or by bicycle. How can both be made possible: mobility for individuals and climate protection for all?

The fact is that our mobility is in a state of upheaval. Car manufacturers are offering more and more electrically powered models. The aviation industry is discussing the introduction of synthetic kerosine produced from renewable energy. IT companies are developing sharing services so that people can get to their destination quickly and conveniently even without their own car. Growing networks of cycle paths are making more room for active mobility and urban planners are concerned with the issue of how the limited public space can be made available to all people on the move on an equal basis.

These developments point in the right direction, but they do not change the fact that the transport sector is miles away from its climate protection target for 2030 and from climate neutrality by 2045. So far, the measures are not ambitious enough and the pace of change is far too slow.

The 2019 Climate Protection Act applied up to mid-2021. Then, in the summer of 2021, the climate protection target was refined: the transport sector must reduce its greenhouse gas emissions (CO_2 equivalents) to 85 million tonnes by 2030 (previously 95 million tonnes), and the emissions must drop to zero by 2045. This was not planned until 2050 before the climate protection targets were updated.

The research report on which this brochure is based was completed before the climate protection targets were readjusted. The instrument proposals, the calculations and thus also the figures and tables are still based on the 2019 Climate Protection Act. This means in plain language: what is recommended in this brochure still points in the right direction but should be implemented somewhat faster and more ambitiously.

The **costs of transport influence** how and with what people can travel. Mineral oil tax, energy taxes, motor vehicle tax, HGV tolls – everyday transport is riddled with prices and costs. The revenues provide the state with money so that it too can fulfil its diverse tasks in the transport sector: the federal, state (Länder) and local governments renew and expand roads and railways, finance buses, trains and cycle paths, and subsidise research and pilot projects that deal with transport issues.

The current system of taxes, duties, levies, fees and subsidies favours frequent drivers and high-income households, promotes urban sprawl and long distances, and wastes resources and raw materials. It is therefore simply unsuitable for post-fossil and socially fair mobility. Therefore: **Germany must change its course**. A cleverly redesigned tax and duty system could in future set the incentives in such a way that environmentally friendly and climate-friendly vehicles are favoured, active forms of mobility are attractive and lower-income households are no longer disadvantaged. The transport sector could then achieve its climate targets and better protect the environment without restricting individual mobility.

2 Fiscal transport transition now!

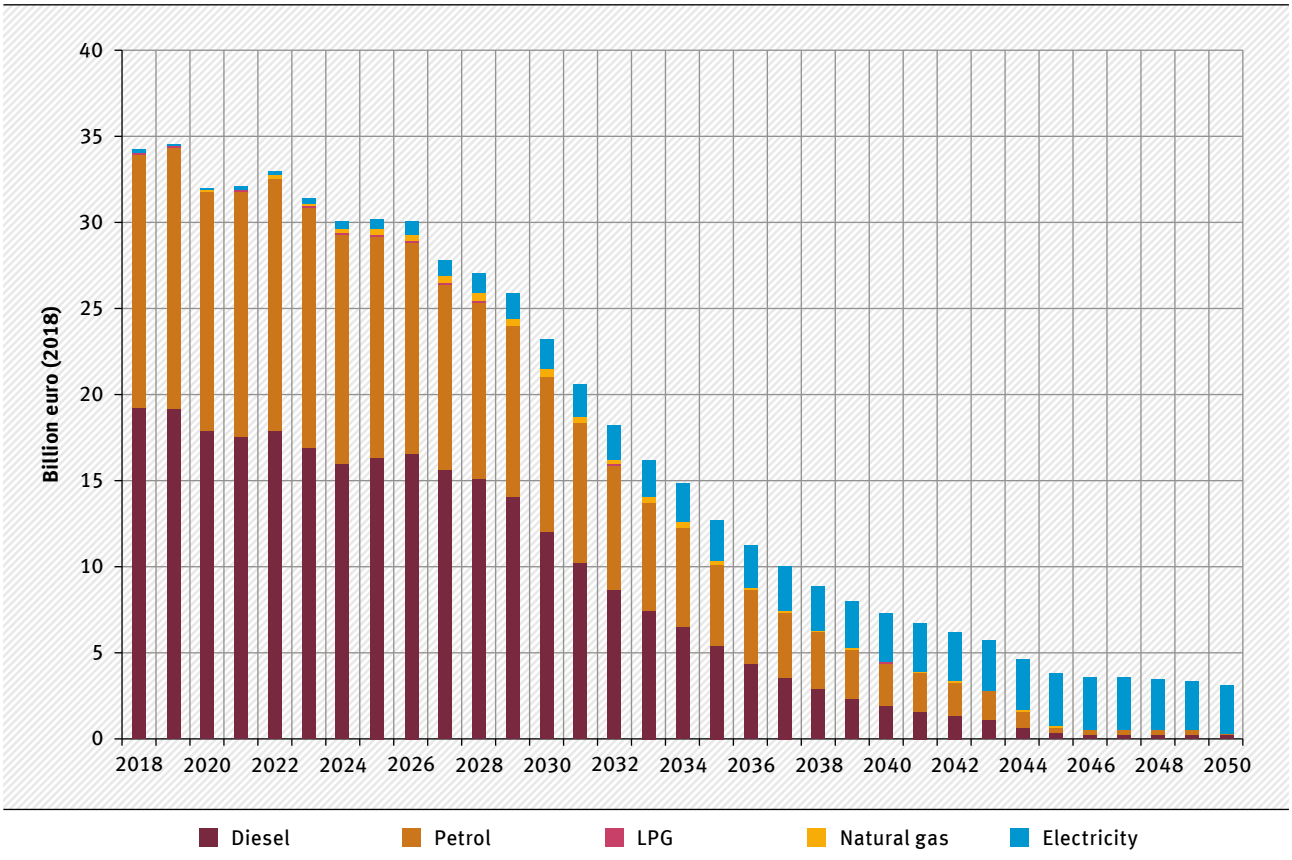
A state must distribute burdens fairly, e.g. adjust tax rates to individual performance. At the same time, it has public responsibilities that go far beyond individually determinable services: clean air, noise protection, climate protection and the conservation of finite resources are among them.

However, taxes and duties have always been used to guide behaviour or to redistribute money with a view to social equality. Over the decades, a network of special regulations and exemptions has grown up in the transport sector that runs counter to the idea of equal treatment. Subsidies such as diesel privilege or mileage allowance cost the state billions every year.

In addition, the faster electrically powered vehicles replace conventional petrol and diesel vehicles in the coming years, the faster the revenue from energy taxes will decline. If the legal situation remains unchanged and the transport sector achieves its climate protection goals through comprehensive electrification, revenues will drop by a third from around €35 billion to €23 billion by 2030.

Figure 1

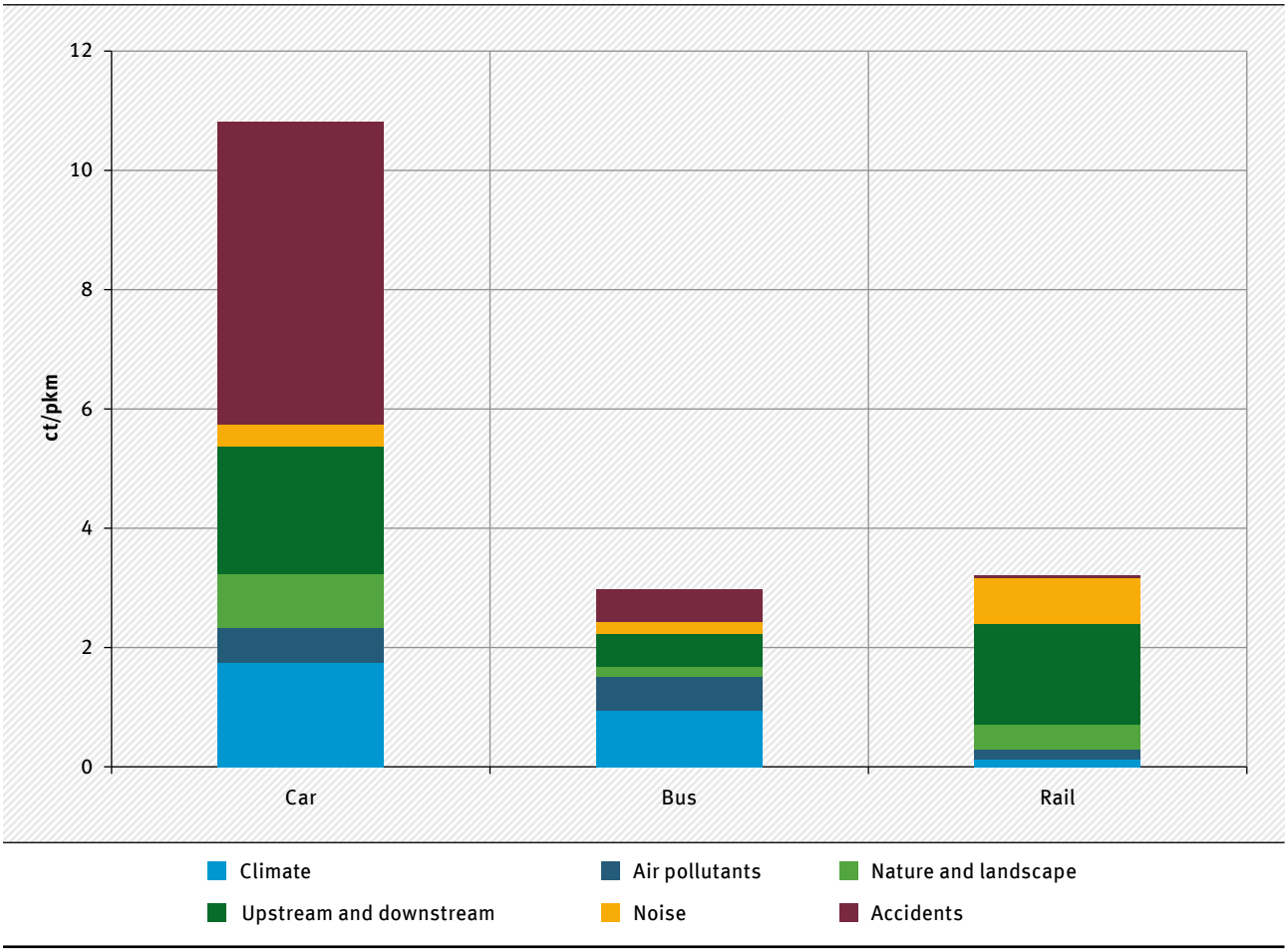
Trend of energy and electricity tax revenue of transport if transport is to achieve its climate protection goals



Source: Institute for Applied Ecology

Figure 2

And who will pay? Hidden environmental costs in passenger transport



Source: infras (2019)

The electricity tax cannot come close to offsetting this decline (cf. Figure 1). This can be shown by a simple calculation: a petrol car (consumption 8 l/100 km) currently costs 5.24 € in energy taxes for a distance of one hundred kilometres, whereas the taxes for a battery-electric vehicle (20 kWh/100 km) are only 41 cents for the same distance.

At the same time, the need for investment in transport remains high and is likely to increase due to future actions[6]. How then will the federal government, the states (Länder) and the municipalities finance the mammoth task of the transport transition, the expansion of railways, public transport and cycle paths and socially fair mobility? This cannot succeed without **fundamental changes in the fiscal framework**.

A climate and environmentally compatible tax and duty system can be established by adjusting existing instruments to be more sustainable and creating new instruments that are focused more on the polluters.

Even in post-fossil mobility, taxes, duties and charges remain one of the strongest levers to steer mobility and technology decisions.

The **abolition of environmentally harmful subsidies** and the **'internalisation of external costs'** is the core of a fiscal transport transition. A simple truth lies behind the complicated term 'external costs': today's petrol prices, air fares, tolls and parking fees reflect only a part of the climate and environmental costs caused by transport. Medical costs due to exhaust fumes and noise pollution and overall economic costs caused by congestion, land-take and the loss of animal and plant diversity have so far been borne by society and future generations (cf. Figure 2). Distorted prices lead to increased traffic, to ever larger vehicles, to higher emissions and thus to a mobility that does more harm than good over the long term.

3 Making progress using intelligent instruments

How can the transformation to decarbonised mobility be achieved? Which taxes and duties need to be adjusted and which new ones need to be created? How must instruments be designed to ensure the financing of the transport transition?

The study by the Institute for Applied Ecology and partners looks into these issues using a new scenario. The targets of Climate Protection Act 2019 are met in this scenario. In this scenario 'Reshaping mobility', environmentally harmful subsidies are removed and external costs of transport are priced. As a result, the transport sector reduces its CO_2 emissions to 91 million tonnes, the sector will become greenhouse gas neutral by 2050 at the latest. The proposed fiscal instruments were checked to see whether they are legally and organisationally feasible, socially acceptable and financially viable.

A number of assumptions were made in the scenario: 72 % of newly registered cars will be electric or plug-in hybrids by 2030. At the same time, the efficiency of new petrol and diesel models will increase. In road freight transport, 45 % of the mileage will already be electric by 2030 and as much as 94 % by 2040. Final energy demand will drop by 29 % by 2030 due to the significantly higher energy efficiency of electric drives. Alternative fuels hardly play a role: there will be a complete 'phase-out' of conventional biofuels by 2030. Advanced biofuels will also be increasingly dispensed with after 2030. The 'Reshaping mobility' scenario expects only 50 PJ of biofuels and 40 PJ of electricity-based fuels in the form of hydrogen for HGVs by 2030.

The precise arrangement of the individual instruments is in part only reasonable or plausible in combination with other instruments. For example, an extension of the buyer's subsidies can only be justified against the background of a corresponding 'malus' (e.g. a higher vehicle tax for high CO_2-emission cars).

Table 1

Instruments in the 'Reshaping mobility' scenario and their effect on transport

Instrument	Incentive for e-mobility	Incentive for more efficient internal combustion engines	Incentive for modal shift	Incentive for shorter and fewer routes
Vehicle or new registration tax ('bonus-malus system')	+	++		
Buyer's subsidies for e-vehicles	+			
Restructuring company car taxation			+	+
Restructuring the mileage allowance				+
Increase in CO_2 price (BEHG)[1]	+	+	++	++
Aligning diesel taxation	+	+	++	++
CO_2 component in the HGV toll	+	+	+	
Mileage-based car toll			++	++

1 BEHG: Fuel Emissions Trading Act

3.1 Changing the vehicle tax ('bonus-malus system')

The vehicle tax is independent of the kilometres driven and is thus a kind of ownership tax. Since 2014, it has included a CO_2 component of two euros for every gram of CO_2 that a newly registered petrol or diesel car emits per kilometre according to the standard. The CO_2 component has carried somewhat more weight since January 2021. The procedure for determining CO_2 emissions has been changed. In addition, the CO_2 component is split up into six stages with a tax rate of two to four euros per gram of CO_2/km. For passenger cars with less than 95 grammes of CO_2/km – essentially plug-in hybrids – a tax reduction of 30 euros will apply until 2025. Purely electric cars are entirely exempt from tax for a maximum of ten years.

VEHICLE TAX

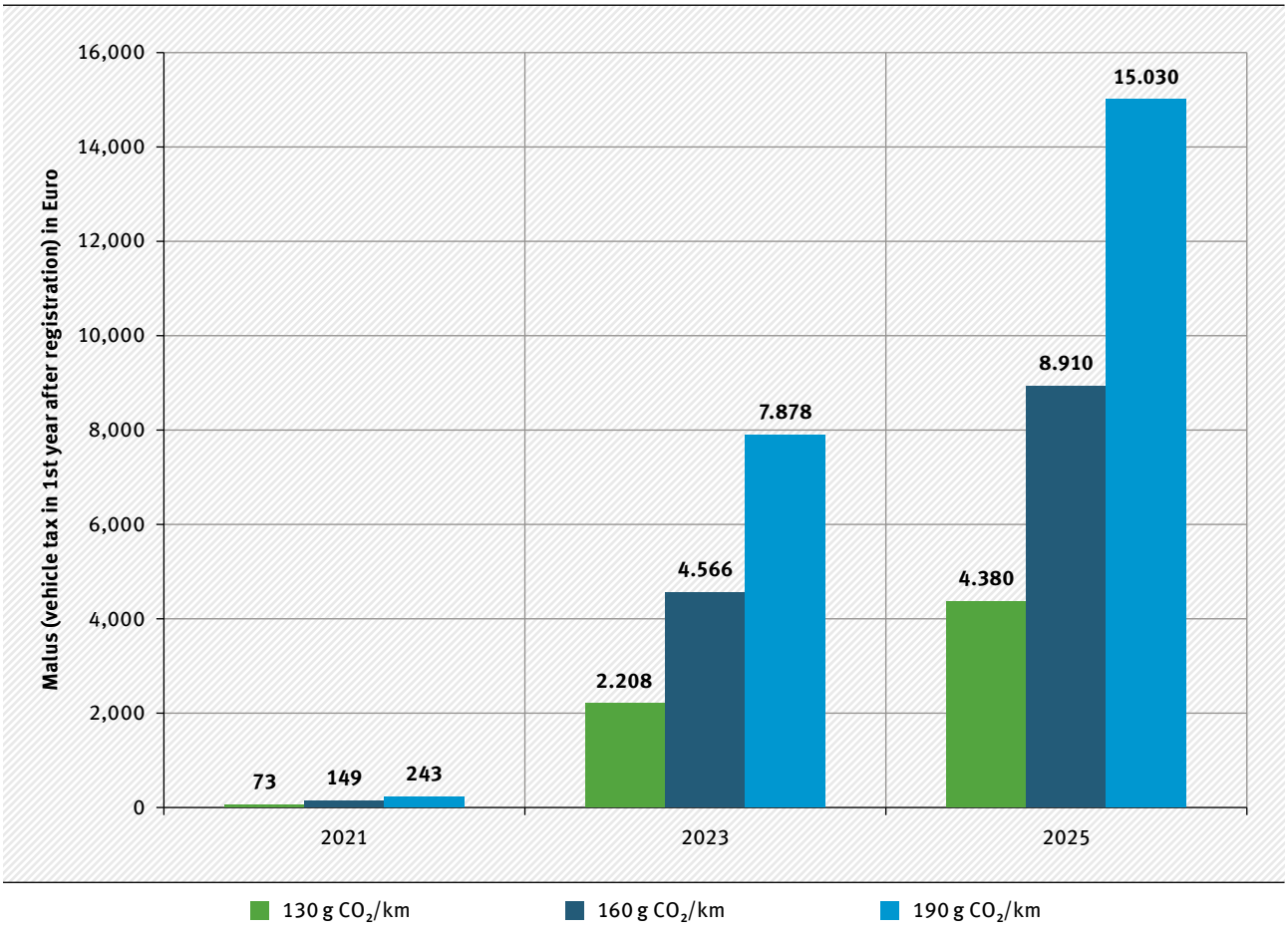
The vehicle tax is a lever that can be used over the short term. A much more significant increase and spread of tax in line with CO_2 emissions would accelerate the switch to more efficient vehicles and alternative drive systems. The vehicle tax could also internalise environmental costs incurred simply by owning a vehicle.

Scheme for the 'Reshaping mobility' scenario

- The vehicle tax will be significantly increased for new vehicles in the first year of registration from 2023 and it will reach 60 times the status quo in 2025.
- The cylinder capacity component will be replaced by an area component which goes up as the size of the vehicle's footprint increases.

Figure 3

A lot of CO_2 – a lot of tax: trend of vehicle tax for new vehicles in the 1st year after registration using the example of three vehicles with different levels of CO_2 emissions



Source: Institute for Applied Ecology

Even the latest increase in the CO_2 component in January 2021 does not change the fact that owning your own car does not cost much in Germany from a tax perspective: the CO_2 component of the vehicle tax is 243 euros a year even for an SUV with 190 g CO_2/km, which is only 53 euros higher than it was at the end of 2020. Moreover, vehicles already registered will remain unaffected by the higher CO_2 surcharge.

A high CO_2 component in the first year after registration in particular, would have a clear impact as it would influence the choice of vehicle like a new registration tax. The one-off high tax when new cars are registered would act like a 'malus' in a 'bonus-malus system' and generate revenues that could be spent on financing buyer's subsidies for electric vehicles (cf. Figure 3). The vehicle tax would then go back to the normal level from the second year onwards.

A registration tax would have a very similar effect to the change in vehicle tax described above. Regardless of which variant the legislator decides on, a corresponding regulation should prevent, if possible, a larger number of cars from being registered abroad and imported into Germany.

3.2 Phasing out buyer's subsidy for e-vehicles

To encourage the spread of e-vehicles, the Federal Government has been paying the buyer's subsidies for cars, light commercial vehicles and, to a lesser extent, larger HGVs with electric drives since 2016. The share of subsidies for cars given by the government was doubled as part of the Corona economic stimulus programme: up to 6,000 euros until 2025 and up to 4,500 euros for plug-in hybrids. In future, the government will also grant an environmental bonus for used e-vehicles. In addition, states (Länder) and municipalities encourage the purchase of electric cars within the framework of research and pilot projects.

The subsidies paid by the government are considerable and that is not the only reason they should be critically viewed. High-income households in particular benefit from the subsidy which saves them a lot of money when they buy a new electric car as a second car for example. However, the subsidy is financed by all taxpayers, including those who do not own a car. It would be more socially fair if there were a subsidy scheme within the group of car buyers. This subsidy scheme could be established, for example, by increasing the vehicle tax (especially for cars with high emissions) to counter-finance the buyer's subsidy for electric vehicles.

The climate benefit achieved by plug-in hybrids also depends on the actual proportion of electric driving. Those who infrequently use the electric drive of their plug-in hybrid hardly contribute to emission reduction but benefit from the subsidy just as much as those who use the electric drive extensively. The subsidised purchase prices may lead to an increase in the number of cars.

BUYER'S SUBSIDY

Buyer's subsidies are only a start-up instrument for a short time and do not make sense over the long term.

In a market where e-vehicles have become the standard, a subsidy can no longer be financed sustainably. It should therefore be replaced by other instruments to make e-cars economically attractive: higher CO_2 prices, lower electricity prices and a vehicle tax that is allotted according to CO_2.

Scheme for the 'Reshaping mobility' scenario

- The buyer's subsidies for pure e-vehicles will be continued until 2024. Counter-financing will come from the 'malus' (increased vehicle tax in the first year after registration).
- The subsidy from the government for plug-in hybrids will stop as early as in 2022.

3.3 Restructuring company car taxation

Vehicles used for commercial purposes are subsidised in Germany today. They can be entered in the balance sheets as business expenses without a price limit and regardless of their emissions. If company cars are also used privately, they are taxed at a flat rate of 1 % per month of the gross list price in Germany. The purchase of e-vehicles has also been favoured via company car taxation since 2019: the tax rate for plug-in hybrids is 0.5 %, for battery electric cars 0.25 %.

The share of commercial vehicles among new registrations has been over 60 % for years. Only about 40 % of the actual pecuniary advantage has been offset by taxation.[5] The state thus misses out on taxes of at least three billion euros annually. The company car privilege should also be viewed critically from a social point of view as it is mainly privileged groups in the population who can claim it for themselves.[12]

COMPANY CAR TAXATION

Company car taxation is a tax privilege for the few and encourages both the purchase of vehicles and high mileage. To be fair, the taxation of company cars must be increased. Private use of company cars should no longer be free. The more the company car is used privately, the more tax should be paid by the users. A second-best solution would be to increase tax rates across the board.

Scheme for the 'Reshaping mobility' scenario

- Private kilometres are taxed: for every 1000 kilometres driven per year, an additional 0.1 % of the list price is taxable.
- The tax benefits for plug-in hybrids as company cars will be abolished immediately.

3.4 Restructuring the mileage allowance

The mileage or commuter allowance enables travel costs between home and work to be deducted from income tax. The mileage allowance will be increased from 2021 onwards: from the 21st kilometre it increases from 30 to 35 cents, from 2024 to 38 cents. 30 cents/km will apply again from 2027 onwards. This increase is intended to compensate long-distance commuters for the new CO_2 price on fuel.

However, the commuter allowance is a misguided incentive. It encourages urban sprawl and the growth of traffic. From UBA's point of view, it is an indirect subsidy that deprives the state of billions in taxes every year. Moreover, it is mainly higher-income people who benefit.[12]

The fiscal effect of the mileage allowance or its abolition was not modelled in the project. Tax losses due to the mileage allowance amounted to 6 billion euros in 2018 according to UBA's current subsidy report.

MILEAGE ALLOWANCE

Increasing the mileage allowance from 2021 gives the wrong incentive. A complete abolition of the flat rate over the short term is debatable but a structural reform or restructuring is recommended over the medium term. Abolition with a hardship clause or a limitation of the mileage allowance (e.g. to the first 20 kilometres) is conceivable.

Scheme for the 'Reshaping mobility' scenario

- The mileage allowance will be abolished in 2030.
- In order to cushion social hardship, travel costs are to be taken into account in income tax in cases of hardship. In addition, the deduction for professional expenses will be increased to compensate for the burden on lower incomes.

3.5 Abolition of the diesel privilege

Diesel or petrol engine? Many people answer this question based on the fuel price. The energy tax on diesel fuel is currently 18.4 cents per litre lower than on petrol. The cost advantage at the petrol station encourages most frequent drivers to buy a diesel car and more and more buyers choose particularly large and high-performance models. The better efficiency of diesel vehicles and thus its climate advantage therefore only exist on paper: in 2019, the emissions from newly registered petrol cars averaged 157.6 grams of CO_2/km, while that from diesel cars was 167.6 grams of CO_2/km.

Aligning energy taxes to the level of petrol (measured by energy content) would make diesel about 18 % more expensive at a price of € 1.20/litre. This sounds a lot, but it would be done in small steps and would be especially noticeable for commercially used vehicles with high mileage and for companies in freight transport.

The tax privilege applies not only to diesel fuel but also to liquid gas, bioethanol and natural gas. These fuels should be taxed according to their energy content in the future. It is an important ecological side effect: plug-in hybrids with diesel engines would be increasingly driven in the emission-saving electric mode if the price of fuel rises significantly.

DIESEL PRIVILEGE

In the future, the energy tax should be established for all fuels according to their respective energy content. The alignment of the tax on diesel fuel could take place successively – every six months in a total of ten steps – which would increase the price per litre only minimally and predictably at each step.

Scheme for the 'Reshaping mobility' scenario

- The energy tax for diesel, natural gas and liquefied petroleum gas will be raised to the level of the energy tax for petrol (established based on energy content) between 2025 and 2029. This will result in a tax rate for diesel of 70.5 cents/litre, about 7.5 % above the rate for petrol.

In a post-fossil mobility, with electricity as an essential energy source, energy taxes on fuels are of decreasing significance. The alignment of the taxation of diesel fuel primarily serves to support the transformation and to remove false price signals.

3.6 Ambitious price path for CO_2

Since 2021, the greenhouse gas CO_2 has also had a price in the heat generation and transport sectors. The 'Fuel Emissions Trading Act' (BEHG) initially started as a fixed price system with 25 euros per tonne of CO_2; by 2025 the price will gradually rise to 55 euros per ton, from 2026 the fixed price for CO_2 will move into a price corridor. Certificates are then auctioned between a minimum price (55 euros per ton of CO_2) and a maximum price (65 euros per ton of CO_2). In 2025, an evaluation will decide on the future type of pricing. For consumers, this means that petrol, diesel, gas and heating oil have been increasing in price gradually and in a predictable manner since 2021.

Energy taxes or CO_2 prices in transport are an economically efficient instrument as they are applied directly at source. They influence both mileage and, over the medium term, the choice of vehicle and means of transport. High prices make electromobility competitive more rapidly. It is indisputable that an unambitious price of 25 €/t CO_2 cannot contribute much to climate protection and does not ensure compliance with the transport sector's targets under the Federal Climate Change Act. The real environmental and climate costs are much higher: UBA has calculated that a price of nominal 237 €/t CO_2 would be necessary by 2030 to map the external costs.

CO_2-PRICE

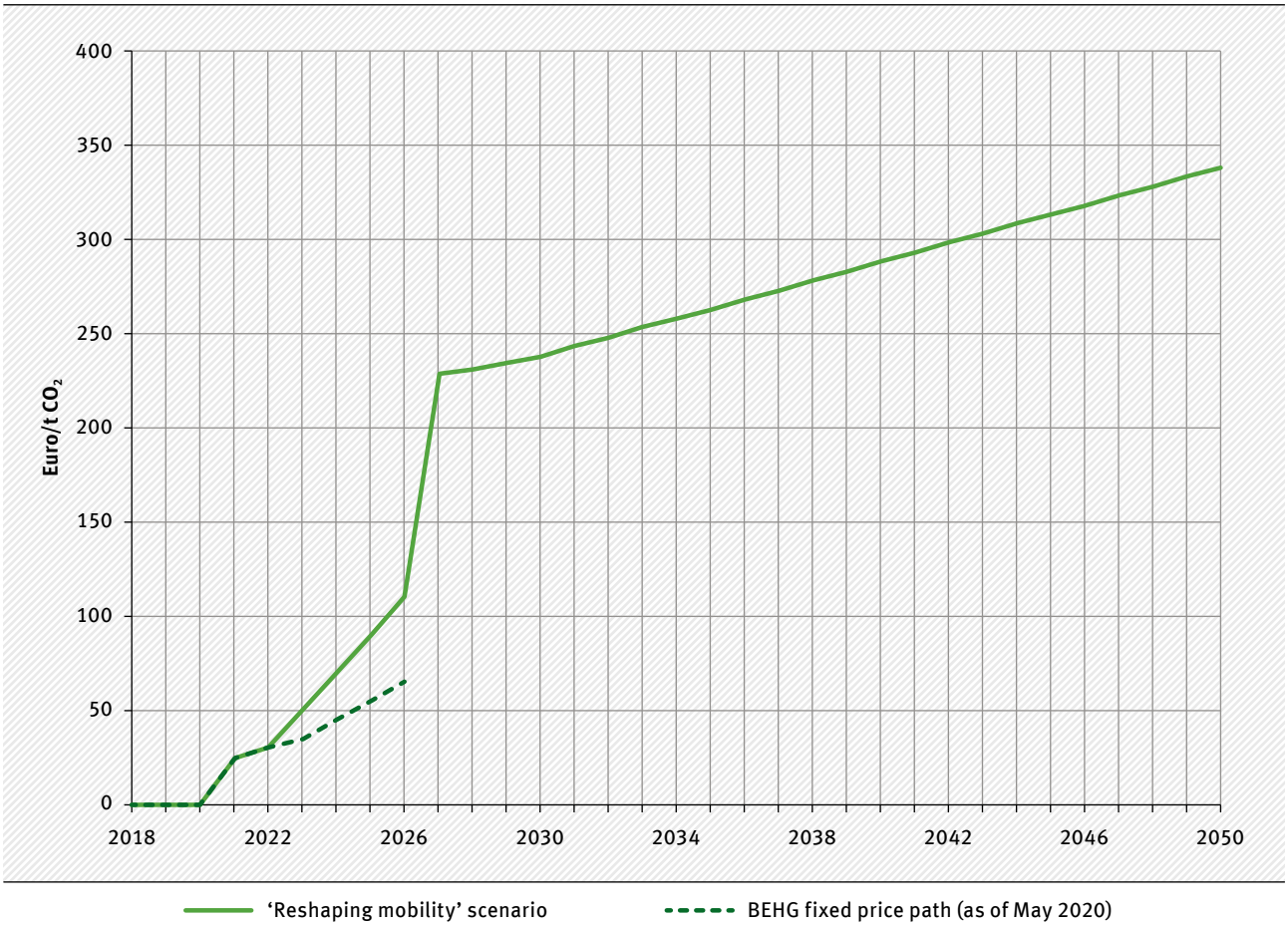
A continuous, predictable increase in CO_2 prices at a high level is a powerful instrument. At the same time, it requires social cushioning via redistribution mechanisms. In order to achieve the 2030 climate protection targets, the price must rise above the previously agreed level by as early as 2025.

Scheme for the 'Reshaping mobility' scenario

- CO_2 prices will increase continuously under the BEHG from 2023 onwards: to 50 €/t in 2023, 70 €/t in 2024, 90 €/t in 2025 and to 110 €/t in 2026.
- This price path ensures in the model that revenues will be sufficient to finance the abolition of the EEG levy from around 2025 onwards. The EEG levy will be gradually reduced: from 6.5 ct/kWh in 2021 to 2 ct/kWh in 2024 and it will be abolished from 2025.
- Between 2027 and 2050, the price path follows a flatter but consistently rising curve, reaching a nominal CO_2 price of 237 €/t in 2030, 288 €/t in 2040 and about 338 €/t in 2050. The revenue could then be partially redistributed via an additional social compensation mechanism (e.g. per capita climate subsidy) from 2027 onwards.

Figure 4

CO_2 gets its price: an ambitious price path in the 'Reshaping mobility' scenario (nominal)



Source: Institute for Applied Ecology

The combination of CO_2 price, electricity price reduction and additional redistribution mechanism through the per capita climate subsidy would have positive social distribution effects. This means that households and families with a low income would on average benefit while high-income households would have to deal with slightly higher costs. The reason for this is that people with higher incomes generally drive more cars while electricity consumption is largely independent of income.

A family of four would save about 260 € per year from abolishing the EEG levy. On the other hand, a CO_2 price of 110 €/t for a car with a petrol engine with current average consumption and average mileage would mean additional costs of about 210 € per year. Diesel vehicles would be charged more, mainly because of their higher average annual mileage. A redistribution mechanism can compensate for further CO_2 price increases (e.g. from the heating sector). In the end, however, compensation should not be available for every car and every driving style – those who drive a lot and emit a lot of CO_2 should pay more. On the other hand, those who emit less (for example, by driving a more fuel-efficient car) will on balance benefit.

3.7 CO_2 component in the HGV toll

Germany levies a toll on motorways and federal roads for HGVs with a permissible total weight of 7.5 t or more. The toll rates so far have mainly taken into account infrastructure costs and to a lesser extent, pollutant emissions and noise caused by HGV traffic. A toll that takes climate protection costs into account has not been possible so far as the EU's Road Charges Policy does not allow CO_2 emissions to be priced.

In December 2020, the EU transport ministers agreed on a revision of the "Eurovignette" Directive. In the future, toll rates will also be based on the CO_2 emissions from vehicles. What exactly the charge structure will look like is still open. According to the plans of the transport ministers, zero-emission vehicles – both e-HGVs and hybrids – will be significantly favoured, although Member States do have some leeway within the individual CO_2 emission classes.

The HGV toll is productive: the revenue was around 7.4 billion euros in 2020. Extending the toll to other roads and vehicle classes can increase the positive environmental steering effect. In order to ensure fair international competition and to avoid 'fuel tourism' from abroad, the CO_2 price of the BEHG in road freight transport should be collected primarily via the HGV toll.

HGV TOLL

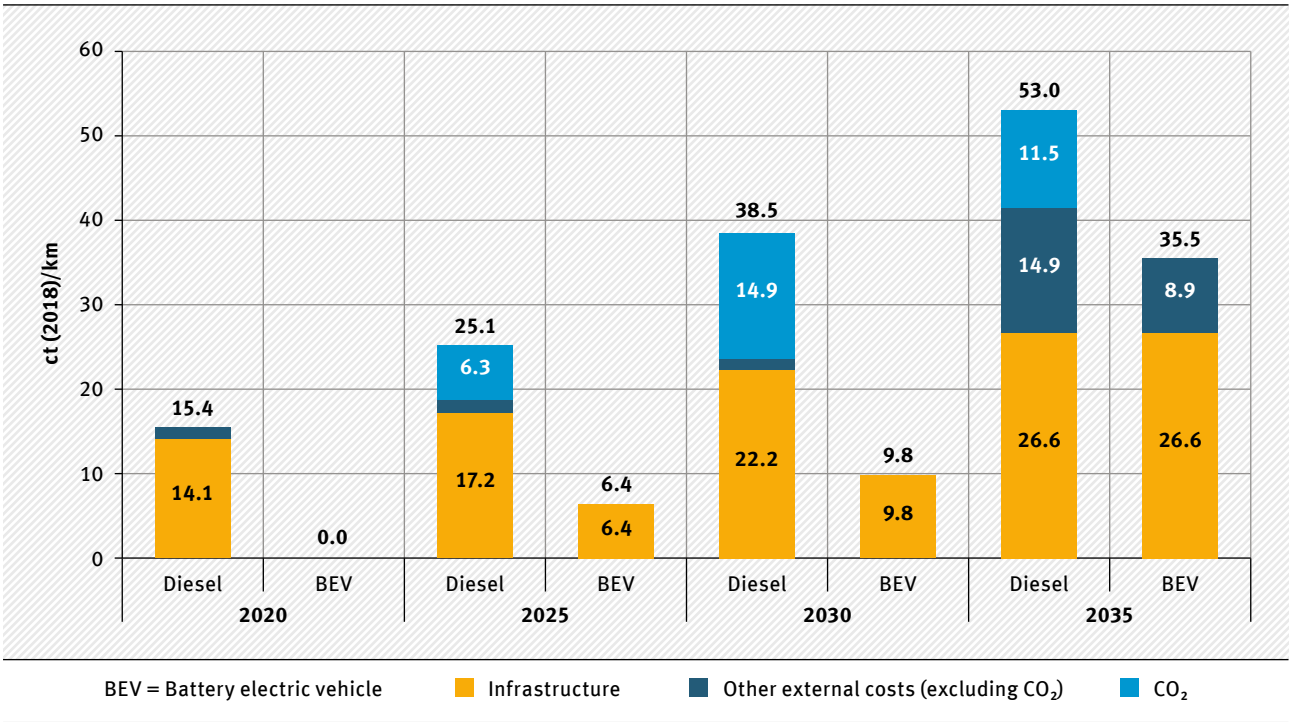
The HGV toll is central to avoiding and shifting road freight transport and accelerates the switch to low-emission and greenhouse gas-neutral drive systems. To this end, it must be ambitiously designed in the future. Furthermore, it must be ensured that a CO_2 component is levied in *addition* to the current toll rates.

Scheme for the 'Reshaping mobility' scenario

- A CO_2 component will be integrated into the HGV toll from 2023. The CO_2 price can be levied via the toll from then on in order to prevent grey imports ("fuel tourism").
- The HGV toll will be extended to all HGVs over 3.5 t and all roads in 2025.
- Initially, e-HGVs will be subject to greatly reduced toll rates for the infrastructure which will gradually rise to the level for conventional HGVs by 2035.
- External costs will increasingly be internalised via the toll by 2035 (e.g. noise or damage to nature and landscape).

Figure 5

HGV toll trend in the 'Reshaping mobility' scenario (based on 2018 costs)



Source: Institute for Applied Ecology

3.8 Introducing a car toll

Their car is a symbol of mobile freedom for many people and it is often the only means of getting from A to B quickly and flexibly in rural regions. The car will probably continue to play an important role in the future, especially in rural regions, but high costs for infrastructure and for previously neglected damage to health, environment and climate must also be paid for. The solution is an intelligently devised car toll that makes users pay different levels: those who travel far and frequently by car pay more. Those who rarely drive or use more climate-friendly cars pay less.

Unlike the 'Toll for foreigners' which was passed in 2016 and has since failed, a polluter-pays car toll does not conflict with EU law. In this scenario a distance-based toll is primarily a catalyst for environmental and climate protection in transport: in contrast to a time-limited toll windscreen-sticker, it is highly efficient from an ecological point of view.[10]

A car toll can compensate for declining tax revenues as electromobility grows. An initial toll rate of about one cent per kilometre driven would yield a revenue of 6.6 billion euros. A toll rate of 4.3 cents/km would fully finance the infrastructure costs and would amount to just under 28 billion euros (based on 2018 car mileage in each case). In purely arithmetical terms, this revenue would largely offset the decline in energy tax revenues from 2030 on.

CAR TOLL

A mileage-based car toll is a powerful instrument for environmental protection that can be designed in various ways. Above all, it serves to ensure that the road infrastructure is financed by the users instead of by the general public. The toll can be extended to include location-dependent noise and pollutant components or be set at different levels depending on the time of the day. A proportional reimbursement to municipalities and states (Länder) is also worth considering to increase acceptance among local and regional stakeholders. The German Association of Towns and Municipalities hopes that a car toll will generate revenue that can be used to eliminate the investment backlog in municipal transport infrastructure.

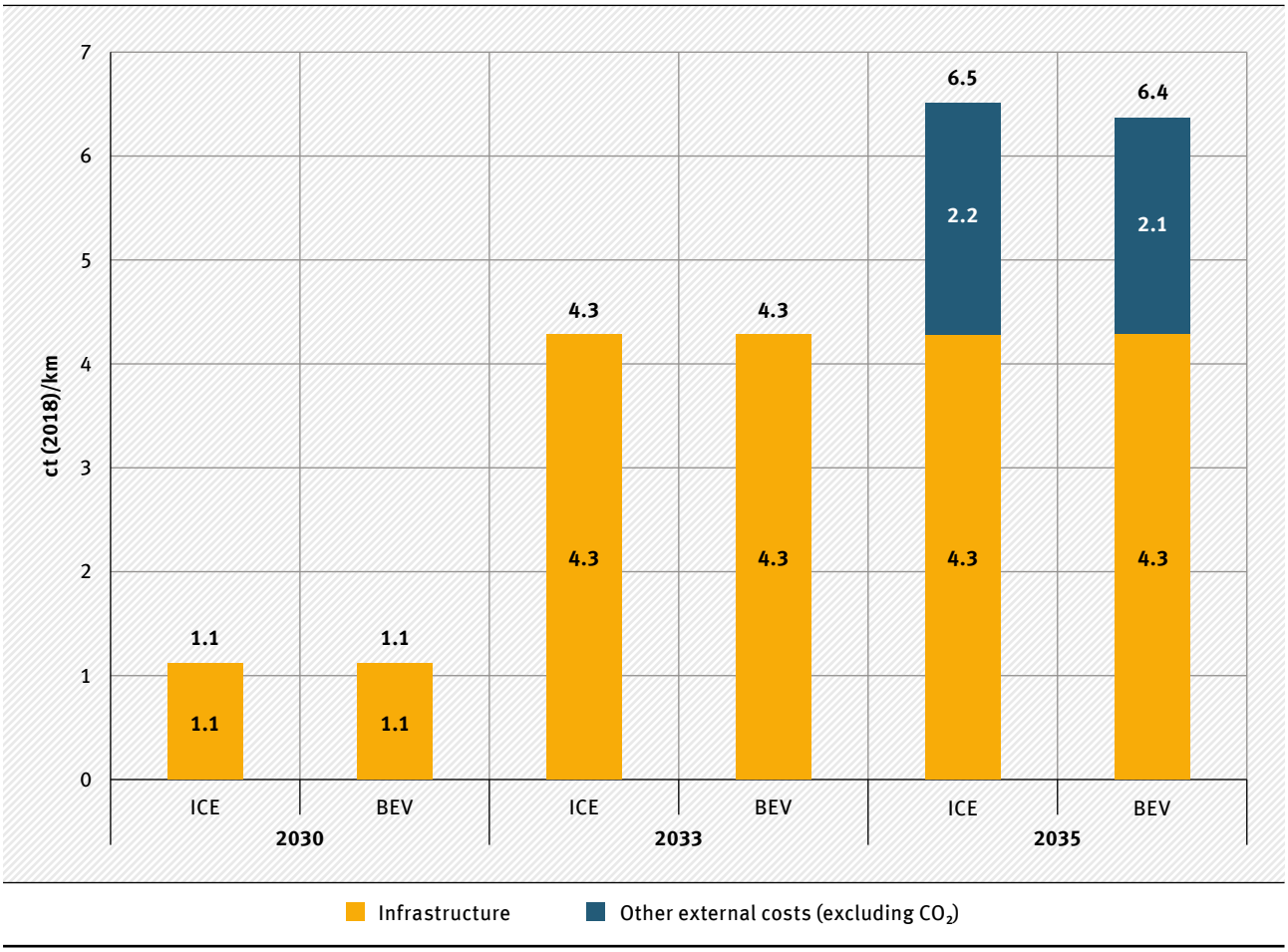
Scheme for the 'Reshaping mobility' scenario

- A toll will be introduced on all roads and for all vehicles including cars from 2030. Toll rates will rise from 1 cent/km to 4.3 cents/km between 2030 and 2033.
- By 2035, external costs of car traffic (excluding CO_2 costs which are levied via fuel) will increasingly be internalised through the toll, with toll rates rising to 6.5 cents/km.

Are there any open questions? Of course, there are some because a user-pays car toll has not yet been discussed extensively either politically or socially. How high are the system's costs? Can the necessary digital collection of movement profiles meet all data protection requirements? How can acceptance be created for this new instrument at an early stage? Nevertheless, a mileage-based toll not only helps to avert the financing gap but would also contribute significantly to making the transport sector climate-neutral by 2045.

Figure 6

Car toll in the 'Reshaping mobility' scenario (based on 2018 costs, ICE = car with an internal combustion engine, BEV = battery electric vehicle)



Fiscal instruments in transport: examples from abroad

1. Registration tax in the Netherlands

If you own a car in the Netherlands, you have to dig deep into your pocket. Vehicles with high CO_2 emissions are taxed especially heavily, much more so than in Germany. Every gram of CO_2 emitted by a vehicle in the Netherlands has its price.

When registering a new vehicle, two different taxes are due: the annual vehicle tax and the **registration tax**. The vehicle tax depends on the type, weight and drive of the vehicle and is many times higher than in Germany: it is between 600 and 1,000 euros for a medium-sized car with an internal combustion engine. The CO_2-dependent registration tax, on the other hand, only needs to be paid once but it can make owning a car really expensive under certain circumstances. An SUV with emissions of 180 g CO_2/km is taxed by about 27,000 euros, a mid-range petrol car with 110 g CO_2/km by about 4,000 euros. Only electric cars and vehicles powered by fuel cells are exempt from registration tax.

The two fiscal instruments have different objectives. The vehicle tax generates constant and predictable revenue for the Dutch government. The registration tax makes low-emission and especially zero-emission vehicles financially much more attractive than vehicles with internal combustion engines. According to statistics, this calculation works: the average CO_2 emission of newly registered vehicles in the Netherlands was 98.4 g/km in 2019, whereas in Germany it was 131.2 g/km.

The Dutch state **constantly adjusts tax rates and conditions**: this is another significant difference to the rigid German vehicle tax. For example, not only electric cars but also plug-in hybrids were originally exempt from registration tax in the Netherlands. As a result, a particularly large number of hybrid vehicles were registered as company cars. However, hybrids are less ecological than fully electric vehicles because they only avoid emissions if they are consistently driven electrically. Since 2017, buyers of plug-in hybrids in the Netherlands have therefore also paid a registration tax of 25 to 83 euros per g CO_2/km. In addition, since 2020 the state has levied a surcharge of 366 euros per g CO_2/km on every newly registered vehicle, and an additional surcharge of around 78 euros per g CO_2/km on diesel vehicles. The only exceptions to this surcharge are emission-free electric cars.

The policy of taxes apportioned according to CO_2 has an effect: more than one in five newly registered vehicles was an all-electric vehicle in the Netherlands in 2020.[(1), (2), (4), (13)]

2. Bonus and malus in France

The French tax authorities also consistently charge car buyers when they register vehicles with high CO_2 emissions. In addition to an engine performance-based registration fee, France has had a **bonus-malus system** in place since 2007. France was one of the first EU countries to react to the introduction of Europe-wide fleet limits with this system.

Anyone who registers a vehicle that exceeds a certain CO_2 emission value must pay a one-time surcharge, the malus, while anyone who registers a particularly low-emission model receives a bonus. Statistically, the instrument has an effect: the average CO_2 emissions of new vehicles were 113.7 g/km in France in 2019, significantly lower than in Germany with 131.2 g/km.

Bonus and malus are not rigid quantities but are adjusted regularly. Originally, the system was supposed to be self-supporting in principle, with the malus financing the subsidies. This calculation did not work out: the buyer's subsidies cost the French taxpayer 200 to 300 million euros per year in the first few years.

Since then, bonuses and maluses have been modified several times. In 2020, France has **significantly changed the calculation basis**. Since March 2020, the CO_2 emissions of the vehicle according to the new WLTP test procedure have been decisive for the calculation of the malus upon registration. WLTP records the emissions of a vehicle more realistically and therefore shows higher values. Since 2021, a penalty must be paid for each additional gram above the threshold of 133 g CO_2/km. Between 133 g CO_2/km and 219 g CO_2/km, the total penalty increases from 50 euros to a maximum of 30,000 euros. The bonus has also been changed. The bonus of 6,000 euros, which had previously been paid for all electric cars and hybrids with emissions of less than 20 g CO_2/km, has from 2020 only been paid in full to private households and only below a vehicle list price of less than 45,000 euros.

However, the steering effect towards emission-free electric cars is limited because the threshold value of 110 g CO_2/km according to the old NEDC measurement procedure and 133 g CO_2/km according to WLTP is set quite high. Therefore, the malus takes effect rather late and does not cover a significant share of the newly registered vehicles with internal combustion engines in France.[1], [2], [7]

3. Expensive company cars in the Netherlands

Anyone who uses a company car privately has a considerable pecuniary advantage that is taxed by the state. In Germany the tax rate is only 1 % per month or 12 % per year – based on the list price of a vehicle – making the private use of company cars attractive for many.

Private use of a company car is much more expensive in the Netherlands: the **tax rate is almost twice as high**: 22 % of the vehicle's list price per year or 1.83 % per month. Only those who can prove that they travel less than 500 km per year privately in the company car are exempt. For zero-emission electric cars or fuel cell vehicles, the tax rate in the Netherlands is also significantly higher than in Germany at 0.67 % per month or 8 % per year. There is no discount for plug-in hybrids. Germany taxes e-cars among company cars at only 0.25 %, plug-in hybrids at 0.5 %.

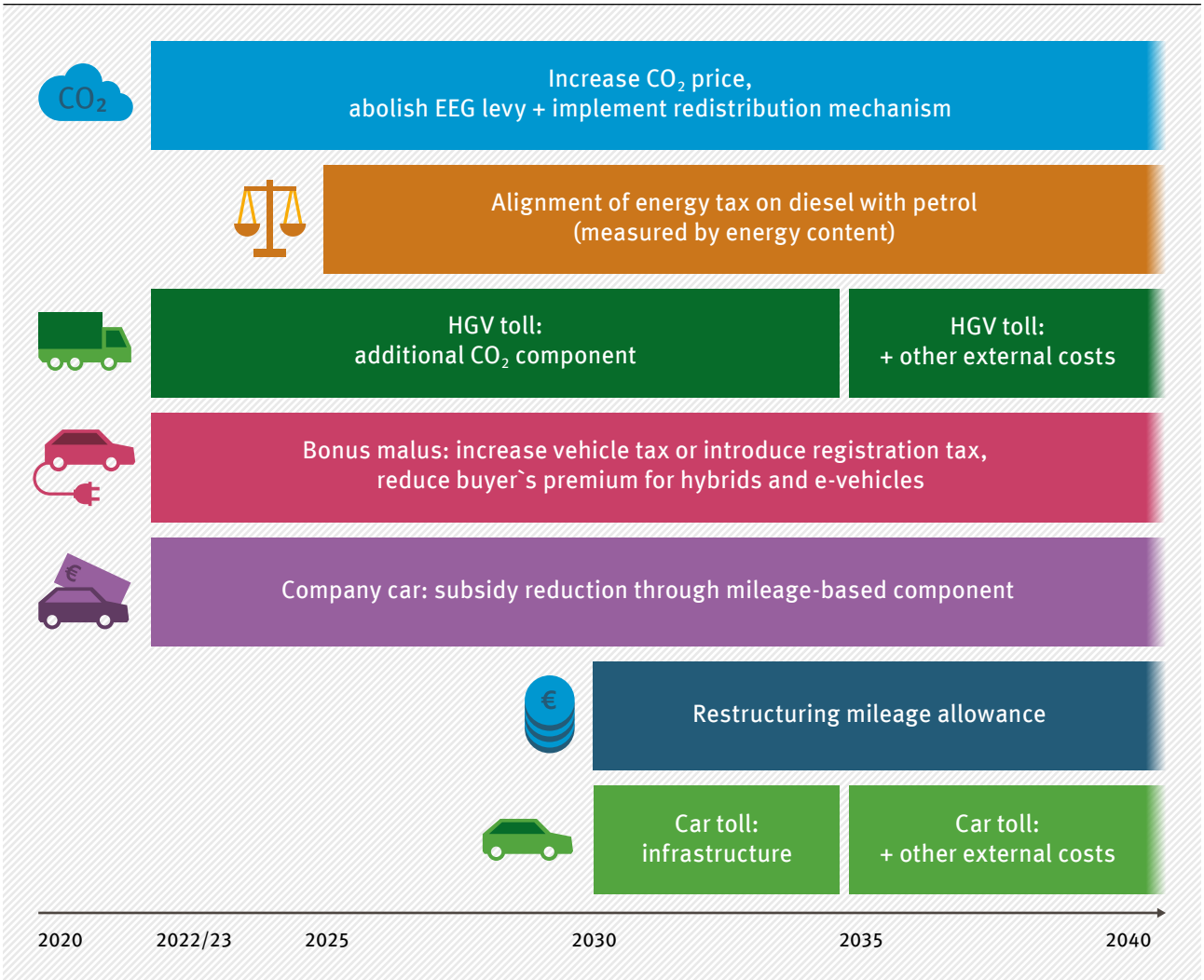
The tax advantage for electric cars has limits in the Netherlands. Since 2019, the reduced taxation has only applied up to a certain gross list price, above which the regular 22 % tax rate applies. The **tax advantage** for company cars with electric motors **will decrease** in several stages within the next few years. From January 2021, the annual tax rate has been 12 % and only applies to models below 40,000 euros. From 2026 onwards, electric cars as company cars will also be taxed at the regular rate in the Netherlands.[9], [13]

4 Reshaping the future: making mobility fair, individual and sustainable

Current energy taxes will lose their key role in post-fossil mobility. Restructuring the fiscal instruments not only enables and facilitates the achievement of the climate protection targets but also has a far-reaching effect: the economic instruments described not only play a key role in the 'Reshaping mobility' scenario but **can create more social equality and avert the threat of a financing gap**. Since economic instruments alone are not sufficient to decarbonise transport, the 'Reshaping mobility' scenario also includes instruments such as fleet limits, greenhouse gas quota, the support of public transport and speed limits.

Figure 7

Instruments for the path to post-fossil mobility



Source: UBA illustration, based on Institute for Applied Ecology, 2021

No one in the population is happy about tax increases or new levies and fees. Therefore, the consideration of interactions, compensation solutions and hardship schemes is of great significance for the implementation of new or adapted instruments. Thus policies will have to be restructured in order to leave the country to future generations where individual mobility is possible and less damaging to the environment. For this reason, it is both politically sensible and fiscally effective to focus on particularly effective instruments.

Over the short term, the following instruments promise particularly high efficiency from 2023 on:

- a successive and ambitious increase in CO_2 prices within BEHG accompanied by the abolition of the EEG levy and an additional redistribution mechanism for compensation,
- a CO_2 component in the HGV toll to encourage electric drives and the modal shift of road freight transport,
- a significant increase in vehicle tax for new cars in the first year of registration (or the introduction of a registration tax) to accelerate the switch to alternative drives ('bonus-malus system' for new cars),
- a higher taxation of company cars to reduce social imbalances.

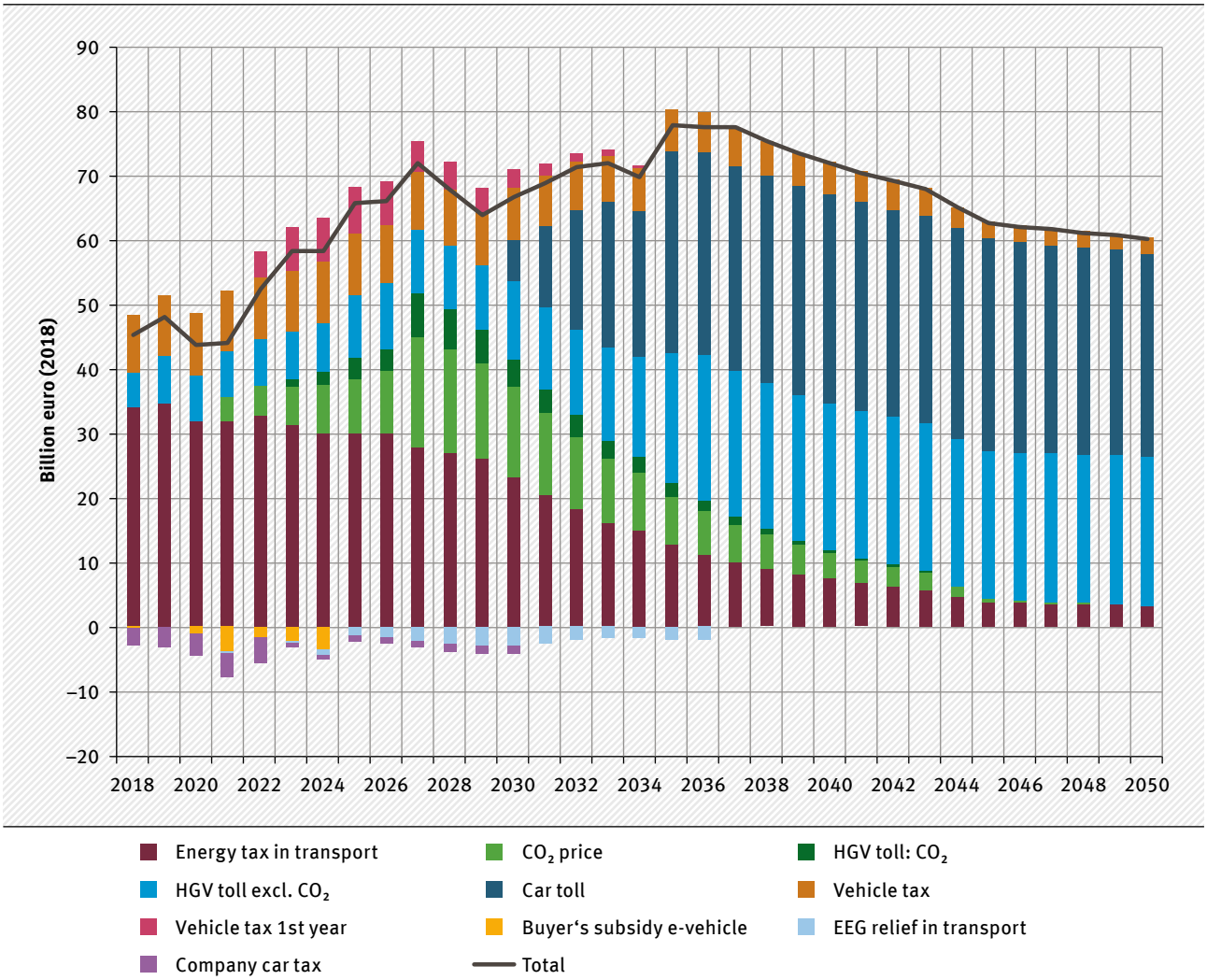
Over the mid term – from 2025 to 2030 – energy taxes should be established for all fuels according to their respective energy content. The mileage allowance should be limited and than abolished.

Over the long term, from 2035 onwards, the 'Reshaping mobility' scenario shows that primarily mileage-based toll systems can ensure sufficient revenue from the transport sector in the future. Then, the duo of an ecologically re-tuned HGV toll and a mileage-based car toll will develop into the core of a new scheme to finance users.

The toll fulfils all three pillars of sustainability: it is social thanks to the principle of polluter-pays fairness. It sets incentives for the least possible damage to health, environment and climate. In addition, a mileage-based toll can ensure the financing of mobility. The government must heavily invest in the charging infrastructure, rail transport and public

Figure 8

Trend of taxes, levies and expenditure in the 'Reshaping mobility' scenario



Source: Institute for Applied Ecology.

transport to achieve the urgently needed transport transition. Additional revenues can also be returned to the citizens more directly and in a socially fair way by reducing electricity prices or introducing a per capita climate subsidy.

The scenario for a sustainable transport sector can be described in two phases: the first phase covers the current decade up to 2030, in which the most important thing is to reduce greenhouse gas emissions as quickly as possible and achieve the goals of the Federal Climate Change Act for transport. This also requires a rapid increase in the CO_2 price.

The second phase covers the period from 2030 to the greenhouse gas neutral year 2045. Successful environmental taxes do away with themselves over time and this also applies to the CO_2 price. If decarbonisation of transport is successful, the pricing of CO_2 will lose significance from about 2035 onwards and the revenue will drop sharply. By then, at the latest, the mileage-based road toll for HGVs and cars will move to the centre of mobility financing. This toll not only charges for road costs but also for external costs such as noise, land use and land fragmentation. In addition to financing and environmental control, a mileage-based toll can also control traffic and thus avoid congestion thanks to variable toll rates for different times and places.

The measures in the 'Reshaping mobility' scenario will finally bring movement to climate protection in the transport sector as well: greenhouse gas emissions will decrease due to the drop in the use of fossil fuels. The target of 91 million tonnes of CO_2 equivalents of the Federal Climate Change Act 2019 will be achieved in 2030, they will then fall below 50 million tonnes in 2035

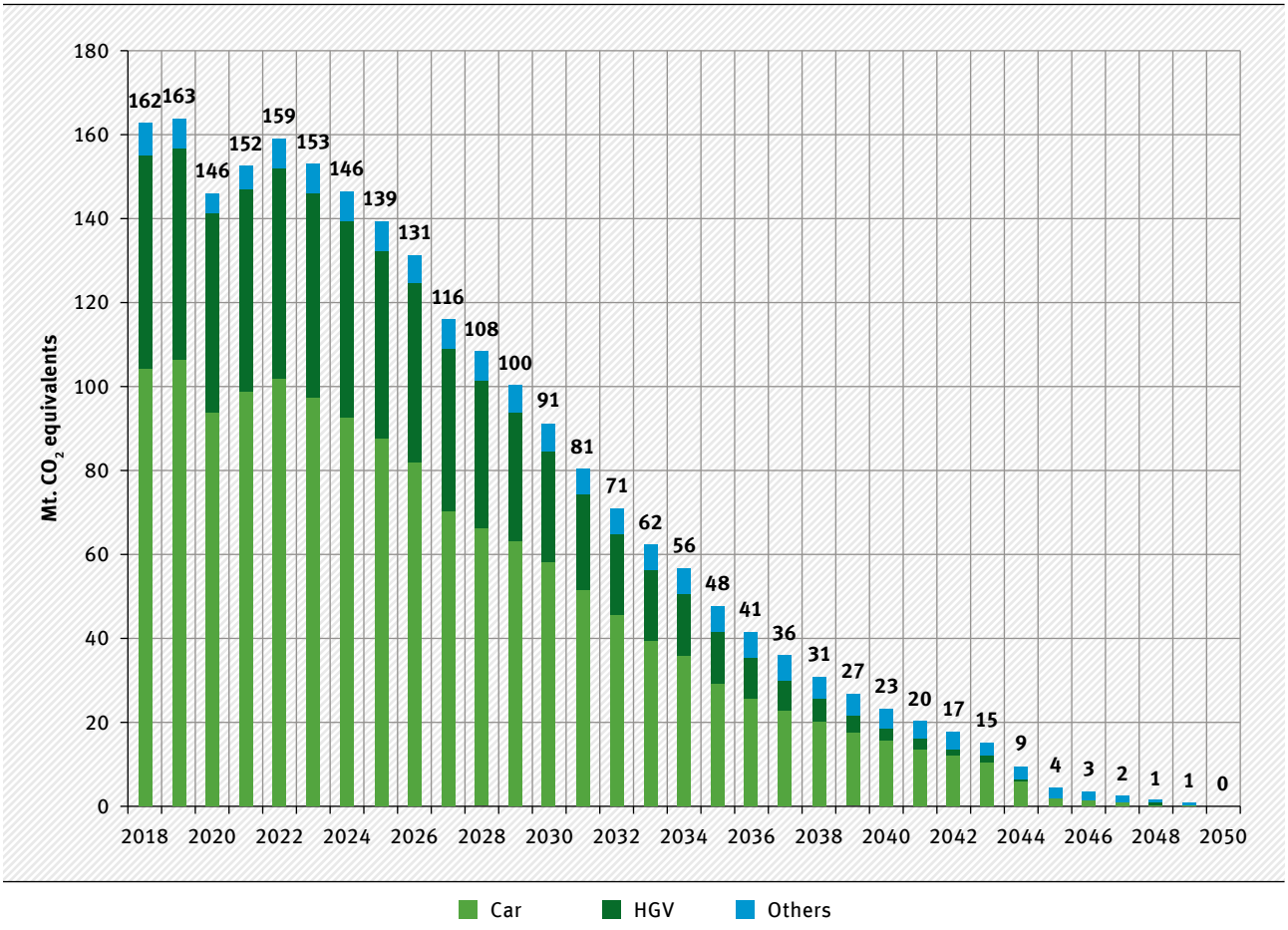
with the transport sector becoming climate-neutral in 2050. The new climate protection target for transport in 2030 is 85 million CO_{2eq}. Climate neutrality must be achieved by 2045. However, it is important to note that the **expansion of renewable energies** must be **significantly accelerated** to ensure that rapid electrification does not lead to carbon leakage towards electricity generation.

Post-fossil taxes, levies and fees are powerful control instruments: they pave the way for the transport sector to achieve its climate targets. They provide the urgently needed transition with a structure that makes Germany more socially fair and secures its financial ability to act. They enable future generations to enjoy individual and sustainable mobility.

The total revenue from all instruments will ensure financing the major tasks of post-fossil mobility to be climate-neutral by 2045. However, economic instruments reach their limits when it comes to the transformation of complex systems such as transport. The **package of measures** must be accompanied by targeted investments by the public sector, for example, in the expansion of attractive local public transport[8], [11] and in active forms of mobility such as cycling and walking.[11], [12] It is also important to have a regulatory framework that ensures technical standards and limiting values and creates planning security for all stakeholders. As a result, the reform proposals make a significant ecological, social and financial contribution to the lives of future generations. Individual mobility will still be possible in the future but in a more environmentally friendly way.

Figure 9

Trend of greenhouse gas emissions (determined as CO_2 equivalents) from national transport in the 'Reshaping mobility' scenario (without upstream chains)



Source: Institute for Applied Ecology

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